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FACTORS INFLUENCING THE DECISION TO REUSE RAIL TRANSPORT SERVICES FROM THE MAIN AIRPORT BY FOREIGN TOURISTS TRAVELING IN THAILAND

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Abstract: This study focuses on investigating factors influencing international tourists' decisions to reuse rail-based mass transit from major airports while traveling in Thailand, using the Airport Rail Link (ARL) system as a case study. The data were collected through questionnaires administered to 400 international tourists, selected through purposive sampling specifically targeting those who had previously used the ARL service from Suvarnabhumi Airport to Bangkok city center, Thailand, combined with convenience sampling methodology. Data analysis employed descriptive statistics, inferential statistics, exploratory factor analysis, and multiple regression analysis. Factors influencing international tourists' decisions to reuse rail-based mass transit from major airports in Thailand can be categorized into four main groups: personal factors, fundamental factors, service factors, and smoothness factors, comprising 22 sub-factors in total. These are distributed as follows: 8 personal sub-factors, 7 fundamental sub-factors, 4 service sub-factors, and 3 smoothness sub-factors. The findings revealed significant correlations between personal factors (occupation, pricing, station location) and fundamental factors (station dwell time, service experience, transit connectivity) with tourists' reuse intentions. Statistical analysis indicated stronger influence from fundamental factors (23.7%) compared to personal factors (13.8%) on service reuse decisions. Notably, service and smoothness factors did not demonstrate statistically significant relationships with reuse intentions, challenging conventional assumptions about their importance. This research contributes to transportation literature by establishing a robust framework for understanding airport rail transit user behavior specific to international tourism contexts. The study's findings provide valuable insights for transportation planners, tourism authorities, and public transit operators seeking to increase ridership and improve service utilization by international visitors**.** The ARL requires immediate strategic development to address Bangkok's growing transportation demands. Key priorities include optimizing facilities for independent international travelers, enhancing baggage handling systems, and improving intermodal connectivity. The implementation of innovative pricing strategies and service quality improvements, particularly in operational efficiency and transfer processes, will enhance passenger experience and support Thailand's sustainable transit development goals while encouraging service reuse among international tourists.

Keywords: public transport, transport services, major airports, international tourists, traveling, Airport Rail Link

* * * * * *

INTRODUCTION

Transportation systems are inherently vital to human activities in both urban and rural areas, encompassing commerce, manufacturing, and notably the tourism industry, which fundamentally relies on the movement of people from their residences or home countries to tourist destinations and other locations. Transportation serves as a crucial link between tourists and destinations, functioning not only as a connection to tourist attractions but also as a catalyst for travel motivation and a key factor in industrial development and growth (Chang et al., 2019).

Currently, numerous countries prioritize developing integrated transportation systems that connect both domestic and international travel routes as an opportunity to enhance their national capabilities and competitiveness (Ibrahim et al., 2020). The aforementioned information reflects the critical importance of developing comprehensive rail transportation systems that effectively meet the needs of both domestic and international users while connecting key destinations. These include airports, shopping centers, World Heritage sites, culinary and shopping districts, and major urban tourist attractions. Such connectivity presents a significant opportunity for business expansion and substantial enhancement of the country's tourism industry. Therefore, rail transportation systems serve as a vital catalyst for tourism while offering long-term solutions to traffic congestion, air pollution, particulate matter, and other related environmental challenges (Fisch-Romito & Guivarch, 2019). Additionally, it effectively facilitates urban connectivity and expansion to accommodate both tourism and other industries (Farooq et al., 2019). Despite higher investment and construction costs compared to other transportation systems, this approach has proven successful, as evidenced by the case study of Japan.

In Thailand, the government has increasingly prioritized policies for developing and enhancing rail transportation infrastructure, focusing on comprehensive coverage across the country's major urban areas. This is particularly evident

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in Bangkok, where government policies have focused on expanding rail transportation networks to achieve more comprehensive route coverage throughout the metropolitan area. Currently, multiple new rail transit routes are under simultaneous construction in Bangkok, with some sections already completed and operating in trial phases while others remain under development. This presents a significant opportunity for Bangkok, as the capital city holds prominence as a globally renowned tourist destination and a key city within the ASEAN region. In the future, when the rail network development meets the Ministry of Transport's coverage targets, it will significantly enhance Bangkok's tourism capabilities and facilitate greater tourist distribution to neighboring secondary cities. This expansion could also contribute to addressing various long-standing challenges faced by the Bangkok metropolitan area (Breuer et al., 2020). In terms of rail-based mass transit from Thailand's major airports, the ARL stands as the sole service provider and the only rail transportation option available for tourists and passengers at Suvarnabhumi Airport, serving as a connection to other rail systems such as the MRT and BTS. Amid various transportation challenges connecting to Suvarnabhumi Airport, alternative modes of transport often present issues for tourists, including inconvenience, excessive pricing, security concerns, and potential exploitation of international visitors. During 2019-2021, spanning the pre- and post-COVID-19 pandemic periods, ARL passenger volume decreased by 86.75%, marking the most significant decline among all rail transit operators in the Bangkok metropolitan area (Siangsuebchart et al., 2021).

This significant decline presents a critical research challenge for service providers and researchers: determining how to sustainably restore international tourist ridership on the ARL. The ARL must identify and implement key factors that will influence international tourists' decisions to utilize its rail transit service from major airports. This initiative aims not only to restore and stimulate ridership but also to contribute to addressing Bangkok's urban challenges, including dust pollution, traffic congestion, and other environmental issues (Promsri, 2015). Such developments align with both global community standards and current government policies that place significant emphasis on these matters.

LITERATURE REVIEW

1. Rail mass transit system from Thailand's major airports

Suvarnabhumi Airport, established in 2006, marked a significant milestone in Thailand's transportation infrastructure as the country's premier international gateway and regional aviation hub. Recognizing the need for efficient city connectivity, the Thai government initiated plans for an express train system linking the airport to Bangkok's city center (Siangsuebchart et al., 2021). The project's development began in September 2003 when the Cabinet approved a feasibility study with a budget of 20 million baht and a 120-day completion timeline. Following this, in November 2003, the government appointed an engineering consultant to design the railway project, allocating 291 million baht with a 240-day timeframe. A major step forward came in June 2004 when the Cabinet approved a substantial construction budget of 30 billion baht, which included 4.08 billion baht specifically for the airport terminal tunnel construction. The ARL finally commenced operations on August 23, 2010, under the management of Sky Train Company Limited, a state enterprise under the Ministry of Transport. The system later underwent an operational transition when it was incorporated into the larger Three Airports High-Speed Rail project in 2021, with operations transferred to the Eastern High-Speed Rail Linking Three Airports Co. Ltd. This development represented a significant evolution in Thailand's public transportation infrastructure, connecting major transportation hubs and enhancing mobility for both residents and visitors.

2. Service of airport

The Suvarnabhumi Airport Rail Link (ARL) is a sophisticated heavy rail transit system that serves as a vital transportation link between central Bangkok and Suvarnabhumi Airport. The infrastructure primarily operates on elevated tracks 20 meters above ground, transitioning to ground-level and underground sections near the airport terminal. The system employs European Standard Gauge tracks (1.435m) with overhead catenary power delivery (Alemi et al., 2018). The ARL's rolling stock consists of modern air-conditioned trains designed for optimal passenger comfort and efficiency. Each car accommodates 250-300 passengers, with trains comprising 3-10 cars operating on a 25kV AC power system. The network's total capacity reaches 50,000 passengers per hour in both directions, supported by advanced automated signaling and fare collection systems (Siangsuebchart et al., 2021).

The network spans eight stations, strategically positioned from Suvarnabhumi Airport to central Bangkok. Two key interchange stations facilitate seamless connectivity with Bangkok's broader mass transit network: Makkasan Station (A6) links to the MRT system, while Phaya Thai Station (A8) provides access to the BTS Skytrain network. Initially, the ARL operated three distinct services to cater to different passenger needs: the SA City Line serving all stations, the Makkasan Express Line providing direct airport-to-city service, and the Phaya Thai Express Line offering rapid airport-to-downtown connectivity. However, due to financial considerations, the express services were discontinued, leaving the SA City Line as the sole operating service (Ibrahim et al., 2020).

3. Statistics of foreign tourists using rail mass transit system from Thailand's major airports

The ARL has demonstrated significant growth in passenger traffic since its inception in 2010. Initial ridership of 4.7 million passengers in the first five months grew steadily, reaching a peak of 23.7 million passengers in 2018. The system achieved its highest daily ridership of 95,771 passengers in March 2019, a substantial increase from the 37,161 passengers recorded on its opening day. By September 2019, cumulative ridership exceeded 170.9 million passengers (Weerawat et al., 2020). The COVID-19 pandemic significantly impacted Thailand's rail transportation systems. Pre-pandemic, the combined daily ridership across all rail systems averaged 1.2 million passengers. Post-pandemic, this

figure dropped to 140,000, representing an 88.76% decrease. The ARL experienced the second-largest decline among Bangkok's rail systems, primarily due to its dependence on international airport traffic. This decline persisted even after domestic travel restrictions were eased, highlighting the ARL's reliance on international tourism (Obsie et al., 2020). These findings underscore the importance of developing an integrated public rail transportation system connecting Suvarnabhumi Airport. Such development would support Thailand's tourism strategic objectives and provide valuable data on international visitor travel patterns (Benferht & Bouder, 2024) ultimately contributing to the enhancement of Bangkok's transportation infrastructure and tourism capabilities.

4. Factors influencing service selection decision

In the Table 1 shows the factors affecting the decision to choose the service. It was found that there were 19 variables that could be extracted the variables were then divided into 7 categories by the researcher: personal factors have gender, age, education, personality, career, and status. social factors have family group, reference groups, group of thought leaders, roles and positions, life cycle. psychological factors have information, experience, famous, security, incentives, recognition, learning, belief, and attitude, economic factors have inflation, income, state policy, marketing factors have product, price, advertising/public relations, promotion, social media, distribution channels cultural factors have culture, sub-culture, social class, and the last one physical factor have ease of access, frequency of administration, service time, timetable, route, facilities, and employees, etc.

Table 1. The factors affecting the decision to choose the service (Source: compiled by the author)

Authors	Factor																		
	Ease of Access	Service frequency	Service Time	Timetable	Route	Price	Facilities	Employees	Social factor	Psychological factors	Learning	Experience	Service Quality	Famous	State policy	Security	Social media and Technology	Incentives	Marketing Mix
Biresselioglu et al. (2018)						√	√	√			√								
Yuen et al. (2018)	√	√	√	√		√		√	√				√			√	√		
Wygonik & Goodchild (2018)			√		√					√			√		√		√		√
Fu et al. (2018)							√	√				√	√	√					
Celik and Akyuz (2018)	√		√	√	√	√	√		√	√	√	√			√	√	√		√
Alemi et al. (2018)					√												√		
Peetawan & Suthiwartnarueput (2018)					√		√	√							√	√			√
Heinold & Meisel (2018)	√		√	√	√		√									√	√		
Gul & Celik (2018)					√		√	√	√		√					√			
Yashiro and Kato (2019)					√	√	√			√			√	√	√	√			√
Whittle et al. (2019)	√	√	√	√	√				√			√			√	√	√	√	√
Liébana-Cabanillas et al. (2019)										√	√	√	√			√	√	√	
Markolf et al. (2019)	√	√	√	√	√	√	√		√				√		√	√	√		√
Jing et al. (2019)					√		√		√		√		√		√	√	√		√
Chang et al. (2019)						√	√												
Wei et al. (2019)									√	√									√
Jaller and Pahwa (2020)					√								√		√	√	√	√	√
Mavrin et al. (2020)	√				√		√				√		√	√		√		√	√
Eren and Uz (2020)	√	√	√	√					√					√	√	√			√
Lăzăroiu et al. (2020)						√				√	√			√					
Chen et al. (2020)							√					√	√			√			
Ibrahim et al. (2020)		√	√	√	√		√				√		√	√	√	√		√	√
Obsie et al. (2020)		√	√		√		√	√	√		√					√			
Dobson (2021)							√								√				√
Przybylowski et al. (2021)											√				√	√			
Orîndaru et al. (2021)							√		√	√	√					√		√	√
Total	**7**	**6**	**9**	**7**	**14**	**7**	**16**	**6**	**10**	**7**	**11**	**5**	**11**	**6**	**12**	**18**	**10**	**6**	**14**

RESEARCH METHODOLOGY

1. Research participants

The samples used in the study were 400 international tourists. The sample size was calculated by the method of Louangrath (2017). The characteristics of the sample were international tourists who had previously used the Airport Rail Link service from Suvarnabhumi Airport to Bangkok city center, Thailand.

2. Research tool

There is a questionnire that used as a research tool. The questionnaire was in 6 parts: 1) Questions about the factors that influence the decision to use the ARL service, 2) Questions about the behavior of foreign tourists who use ARL services

via Service Touch Points, 3) Questions about the behavior of effectiveness of ARL services via Service Touch Points, 4) Questions about foreign tourists' decision to use the ARL service repeatedly, 5) Questions about Demograhics, and 6) Suggestions. The reliability of the questionnaire was determined by Cronbach's reliability Coefficient alpha with a group 30 participants with similar characteristics with the samples (Adamson & Prion, 2013). The reliability of the questionnaires was at 0.952, with a confidence value of 0.7 or higher. Therefore, it can be concluded that these questionnaires are reliable.

3. Data collection and analysis procedures

The data collection employed two primary sources: questionnaire responses and documentary analysis. Participants were offered flexibility in questionnaire completion, with options for both paper-based and Google Form submissions according to their preference. Participation was voluntary, with respondents retaining the right to withdraw at any time. The data collection phase spanned from July to September 2023, and the study received ethical approval (Ethics Committee Reference: ECNIDA 2022/0140). The quantitative data analysis utilized SPSS software, incorporating descriptive statistics, inferential statistics, exploratory factor analysis (EFA), and multiple regression analysis. Mean scores from Likert scales were interpreted following Boonchom Srisaard's (2010) evaluation criteria. Additionally, Confirmatory Factor Analysis (CFA) was conducted using AMOS software. Research Methodology Steps are illustrated in Figure 1.

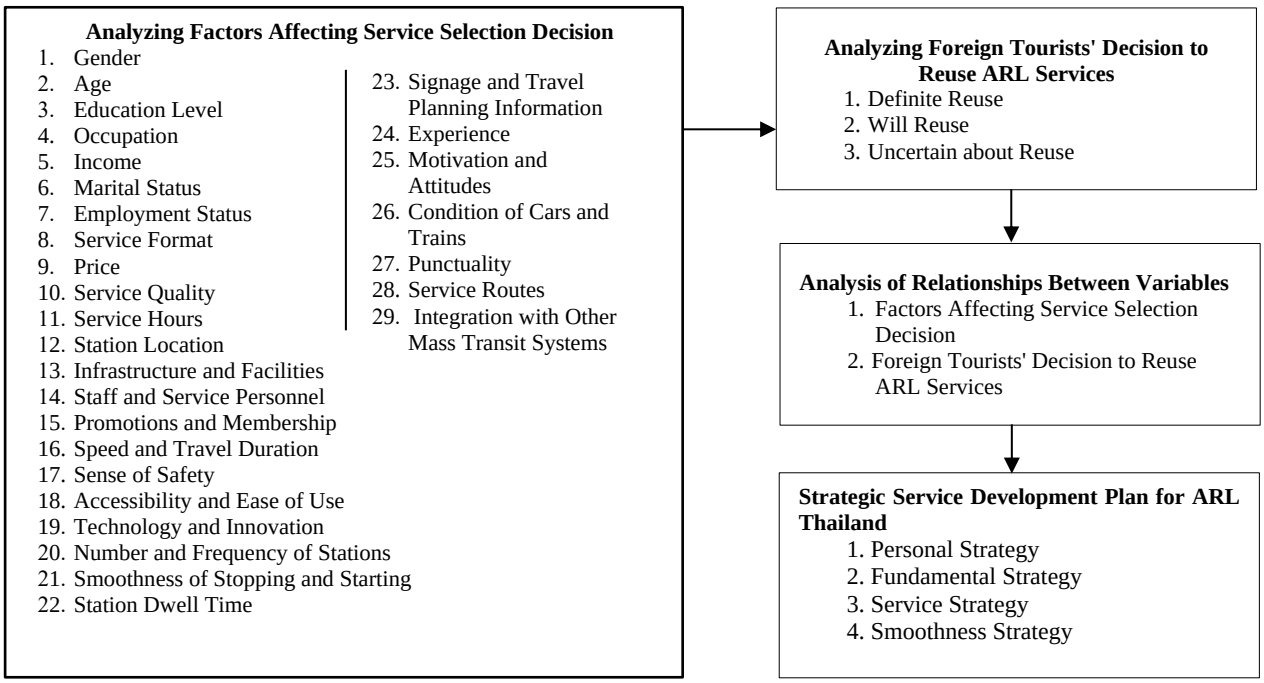


Figure 1. Research methodology steps

RESULTS

Exploratory Factor Analysis (EFA) was conducted to examine the preliminary suitability of variables affecting ARL service decision-making. The survey results revealed a Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) of 0.883, which is greater than 0.80 and approaches 1. Additionally, Bartlett's Test of Sphericity showed a chi-square value of 4,196.367 with statistical significance at 0.000. These results indicate that the variables are highly suitable for further analysis (Cerny & Kaiser, 1977), as shown in Table 2. Factor extraction was performed using Principal Component Analysis (PCA). The extraction results show only components with eigenvalues greater than or equal to 1, following factor analysis principles (Guttman, 1954). Four components were identified, with eigenvalues ranging from 1.12 to 6.25. The percentage of variance ranged from 5.11 to 28.43, with a cumulative variance percentage of 61.10, as shown in Table 3.

Table 2. KMO and Bartlett's test values for factors affecting ARL service decision

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.883
Bartlett's Test of Sphericity	Approx. Chi-Square	4196.367
	df	231
	Sig.	.000

Table 3. ARL factor extraction of variables affecting arl service decision

Component	Variance	Percentage of Variance	Cumulative Percentage of Variance
1	6.255	28.431	28.431
2	4.072	18.507	46.938
3	1.992	9.053	55.991
4	1.125	5.114	61.106

For component rotation, the researcher employed Orthogonal Rotation using Varimax with Kaiser Normalization to achieve clearer variable characteristics. According to the criteria for appropriate factor loading consideration, variables must have a factor loading of 0.5 or higher (Harlow, 2002). If an observed variable has a higher loading in any component, it should be assigned to that component. Therefore, the researcher categorized the factors affecting ARL service decisions into 4 components, comprising 22 observable variables, with 7 variables being eliminated, namely:

FT1: Gender factor influencing service selection decision

FT2: Age factor influencing service selection decision

FT14: Infrastructure and facilities factor of ARL influencing service selection decision

FT16: Promotions and membership factor of ARL influencing service selection decision

FT20: Technology and innovation factor of ARL influencing service selection decision

FT22: Smoothness of stopping and starting factor of ARL influencing service selection decision

FT24: ARL Punctuality factor of ARL influencing service selection decision

Due to their factor loadings being less than 0.50, these variables were eliminated. The remaining variables were then categorized into four components: Personal Factors, Fundamental Factors, Service Factors, and Smoothness Factors, as shown in the exploratory factor analysis results in Table 4.

Table 4. Exploratory factor analysis of variables affecting ARL service decision

Code	Extracted Variables	Factor Loading				Cronbach's Alpha
		Personal Factors	Fundamental Factors	Service Factors	Smoothness Factors	
FT9	ARL pricing factor influencing service selection decision	0.779				0.876
FT8	ARL service format factor influencing service selection decision	0.772				
FT6	Marital status factor influencing service selection decision	0.771				
FT7	Employment status factor influencing service selection decision	0.769				
FT5	Income factor influencing service selection decision	0.743				
FT10	ARL service quality factor influencing service selection decision	0.709				
FT4	Occupation factor influencing service selection decision	0.657				
FT13	ARL station location factor influencing service selection decision	0.616				
FT28	ARL integration with other mass transit systems factor influencing service selection decision		0.808			0.883
FT25	ARL signage and travel planning information factor influencing service selection decision		0.796			
FT27	Personal motivation and attitude factor influencing service selection decision		0.787			
FT29	ARL train cars and fleet condition factor influencing service selection decision		0.786			
FT23	ARL station dwell time factor influencing service selection decision		0.728			
FT26	Previous experience with ARL service factor influencing service selection decision		0.667			
FT21	ARL number and frequency of stations factor influencing service selection decision		0.645			
FT12	ARL service route factor influencing service selection decision			0.839		0.831
FT11	ARL service hours factor influencing service selection decision			0.780		
FT13	ARL station location factor influencing service selection decision			0.741		
FT15	ARL staff and service personnel factor influencing service selection decision			0.674		
FT18	ARL safety perception factor influencing service selection decision				0.807	0.810
FT19	ARL accessibility and ease of use factor influencing service selection decision				0.747	
FT17	ARL speed and travel duration factor influencing service selection decision				0.730	
Overall Reliability of Factors Affecting ARL Service Decision						**0.876**

Subsequently, the researcher examined the relationship between factors affecting foreign tourists' decisions to reuse ARL services by analyzing correlation coefficients. This analysis was conducted to test hypotheses regarding factors influencing foreign tourists' repeat use of ARL services, with details as follows:

From Table 5, among the Personal Factors affecting foreign tourists' decision to reuse ARL service, the occupation factor showed the highest correlation (49.9%), followed by ARL service format (47.4%), while ARL pricing showed the lowest correlation (39.3%). Regarding fundamental factors affecting foreign tourists' decision to reuse ARL services, personal motivation and attitude showed the highest correlation (49.3%), followed by integration with other mass transit systems (46.0%), while signage and travel planning information showed the lowest correlation (40.8%).

Regarding service factors affecting foreign tourists' decision to reuse ARL services, staff and service personnel showed the highest correlation (38.4%), followed by station location (33.8%), while service hours showed the lowest correlation (27.2%). Finally, regarding smoothness factors affecting foreign tourists' decision to reuse ARL services, safety perception showed the highest correlation (42.4%) , followed by accessibility and ease of use (39.1%), while speed and travel duration showed the lowest correlation (38.4 %).

Table 5. Correlation coefficients between factors affecting foreign tourists' decision to reuse ARL Services

Personal Factors:	**ARL Service Effectiveness Through Service Touch Points**	
	R	**P Value**
1. Occupation	.499	.000
2. Income	.421	.000
3. Marital status	.450	.000
4. Employment status	.394	.000
5. Service format	.474	.000
6. Price	.393	.000
7. Service quality	.429	.000
8. Station location	.446	.000
Fundamental Factors	**ARL Service Effectiveness Through Service Touch Points**	
	R	**P Value**
1. Number and frequency of stations	.435	.000
2. Station dwell time	.448	.000
3. Signage and travel planning information	.408	.000
4. Service experience	.456	.000
5. Personal motivation and attitude	.493	.000
6. Integration with other mass transit systems	.460	.000
7. Trains, cars, and fleet condition	.453	.000
Service Factors	**ARL Service Effectiveness Through Service Touch Points**	
	R	**P Value**
1. Service hours	.272	.000
2. Service route	.320	.000
3. Station location	.338	.000
4. Staff and service personnel	.384	.000
Smoothness Factors	**ARL Service Effectiveness Through Service Touch Points**	
	R	P Value
1. Speed and travel duration	.384	.000
2. Safety perception	.424	.000
3. Accessibility and ease of use	.391	.000

Table 6. Correlation coefficients of factors affecting foreign tourists' decision to reuse ARL Services

Personal Factors	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	***β***		
1. Occupation factor	.361	.603	.508	2.973	.003
6. ARL price factor	.119	.709	.114	1.449	.005
8. ARL station location factor	.908	.506	.900	1.729	.000

$R = .138$, $R^2 = .019$, $F = .948$, P Value < 0.05

Fundamental Factors	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**β**		
2. ARL station dwell time factor	.131	.604	.138	2.036	.042
4. ARL service experience factor	.170	.057	.201	2.977	.003
6. ARL service experience factor	.171	.071	.168	2.414	.016

$R = .237$, $R^2 = .056$, $F = 3.325$, P Value < 0.05

From Table 6, personal factors influence foreign tourists' decision to reuse ARL services at 13.8 percent. When analyzing individual variables within personal factors, ARL station location factor shows the highest influence at 90.8 percent ($\beta = .900$, $t = 1.729$), followed by occupation factor at 36.1 percent ($\beta = .508$, $t = 2.973$), and ARL price factor at 11.9 percent ($\beta = .709$, $t = 1.449$), respectively. Analysis of fundamental factors affecting foreign tourists' decision to reuse ARL services shows an overall influence of 23.7%. When examining individual variables within fundamental factors, train cars and fleet condition accounts for 17.1 percent ($\beta = .168$, $t = 2.414$), followed by service experience at 17.0% ($\beta = .201$, $t = 2.977$), and train cars and fleet condition at 13.1% ($\beta = .138$, $t = 2.036$), respectively.

Table 7 indicates that personal factors affecting foreign tourists' decision to reuse ARL services, including users' occupation, ARL pricing, and ARL station location factors, demonstrate statistically significant relationships with foreign tourists' decision to reuse ARL services. Users' income, marital status, employment status, ARL service format, and ARL service quality factors show no statistically significant relationship with foreign tourists' decision to reuse ARL services. The fundamental factors influencing foreign tourists' decisions to use ARL services again comprise three significant elements: ARL station dwell time, service experience on ARL, and transit connectivity with other public transportation modes. Statistical analysis revealed that these factors demonstrated a significant correlation with foreign tourists' repeat service usage decisions of the ARL. The statistical analysis indicated no significant correlation between foreign tourists' decisions to reuse ARL services and several factors: the number and frequency of ARL stations, signage and travel planning information, personal motivation and attitudes, and the condition of ARL cars and trains. These variables demonstrated no statistically significant relationship with foreign tourists' repeat service usage decisions.

Table 7. Hypothesis testing results for factors affecting foreign tourists' decision to reuse ARL services

Hypothesis No.	Personal Factor Hypotheses	Analysis Results
H1.1.1	**Occupation**	**Supported**
H1.1.2	Income	Rejected
H1.1.3	Marital status	Rejected
H1.1.4	Employment status	Rejected
H1.1.5	Service format	Rejected
H1.1.6	**Price**	**Supported**
H1.1.7	Service quality	Rejected
H1.1.8	**Station location**	**Supported**
Hypothesis No.	**Fundamental Factor Hypotheses**	**Analysis Results**
H1.2.1	Number and frequency of stations	Rejected
H1.2.2	**Station dwell time**	**Supported**
H1.2.3	Signage and travel planning information	Rejected
H1.2.4	**Service experience**	**Supported**
H1.2.5	Personal motivation and attitude	Rejected
H1.2.6	**Integration with other mass transit systems**	**Supported**
H1.2.7	Trains, cars, and fleet condition	Rejected
Hypothesis No.	**Service Factor Hypotheses**	**Analysis Results**
H1.3.1	Service hours	Rejected
H1.3.2	Service route	Rejected
H1.3.3	Station location	Rejected
H1.3.4	Staff and service personnel	Rejected
Hypothesis No.	**Smoothness Factor Hypotheses**	**Analysis Results**
H1.4.1	Speed and travel duration	Rejected
H1.4.2	Safety perception	Rejected
H1.4.3	Accessibility and ease of use	Rejected

The analysis of service-related factors affecting foreign tourists' decisions to reuse ARL services revealed several noteworthy findings. The statistical analysis demonstrated that none of the examined service dimensions exhibited significant correlations with passengers' repeat usage intentions. Specifically, operational aspects such as service hours, route coverage, and station locations showed no statistically significant relationship with foreign tourists' reuse decisions. Similarly, staff and service personnel performance did not emerge as a significant factor in influencing repeat patronage. Furthermore, the investigation extended to additional service attributes including travel efficiency metrics, safety considerations, and accessibility features. The study found that travel speed and journey duration, perceived safety levels, and ease of service access demonstrated no statistically significant correlation with foreign tourists' decisions to utilize ARL services again.

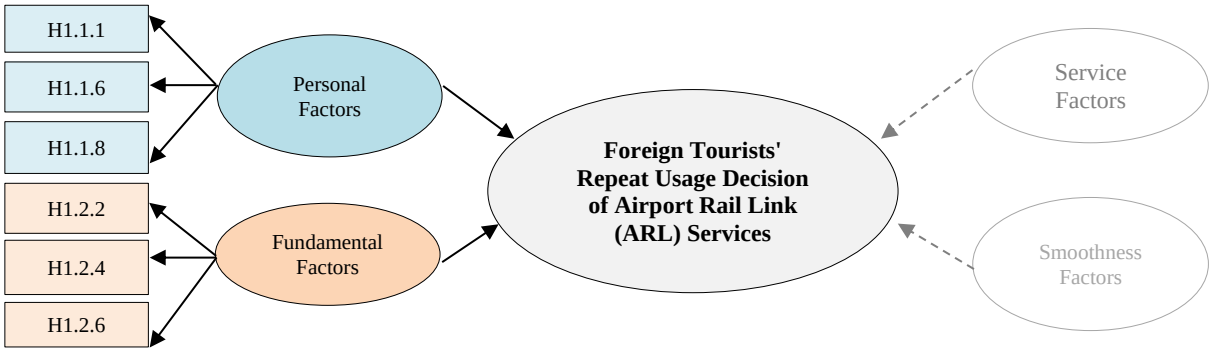


Figure 2 Multiple regression analysis model: relationships between factors affecting foreign tourists' ARL service usage and their repeat service usage decisions (with sub-variables)

DISCUSSION

Research into factors influencing the use of Airport Rail Link (ARL) services by foreign tourists in Thailand reveals two primary categories of influence, encompassing six crucial sub-factors that significantly impact service utilization and customer retention. The analysis demonstrates the intricate relationship between personal and fundamental factors in shaping tourists' decisions to use and reuse ARL services. Personal factors emerge as significant determinants in service selection and reuse. These include occupational characteristics of service users, which directly influence travel preferences and requirements; pricing considerations, which affect value perception and usage frequency; and station location accessibility, which impacts service convenience and utility. This finding aligns with Celik & Akyuz (2018), who identified similar personal factors as crucial elements in transportation decision-making processes. The fundamental factors, equally critical in determining service utilization, comprise three key elements: station dwell time management, focusing on efficient passenger boarding and alighting periods; intermodal transit connectivity, emphasizing seamless integration with other public transportation systems; and previous service experience, which significantly influences future usage decisions. This observation is supported by Ibrahim et al. (2020), who emphasized the importance of service quality and integration in public transportation systems.

Historical evidence supports ARL's significant potential, as demonstrated by its remarkable growth from 4.7 million passengers in early 2010 to a peak of 23.7 million in 2018. However, as reported by Weerawat et al. (2020), the COVID-19 pandemic significantly impacted these numbers, with passenger volume decreasing by 86.75% during 2019-2021, marking the most significant decline among all rail transit operators in the Bangkok metropolitan area (Siangsuebchart et al., 2021).

The findings suggest that enhancing ARL's appeal requires a multi-faceted approach. For personal factors, occupational differentiation demands customized facilities and services, particularly for business travelers. This aligns with Yuen et al. (2018)'s findings on the importance of user-specific service adaptations. Pricing strategies must evolve to accommodate the growing trend of independent travelers, while station accessibility needs to prioritize seamless connectivity and efficient luggage handling systems. Regarding fundamental factors, the current limitation to SA City Line operations necessitates optimal station dwell time management. This operational aspect becomes particularly crucial given Bangkok's status as one of the world's most congested cities, as noted by Promsri (2015). The integration with other mass transit systems (BTS, MRT) and alternative transport modes must be strengthened to enhance the overall transit experience.

This analysis aligns with contemporary research by Benferht & Bouder (2024), who emphasize the crucial role of metropolitan transit system development. Their research highlights the growing dependence on integrated transportation networks for urban tourism, underscoring the importance of organized metropolitan spaces through enhanced transport infrastructure. These developments aim to effectively manage tourist flows and reduce congestion in urban centers. The comprehensive improvement strategy addressing these factors would position ARL as an integral component in Bangkok's sustainable urban development, aligning with government policies and objectives. Such enhancements would not only increase utilization and repeated patronage by foreign tourists but also contribute to establishing ARL as a sustainable solution within Bangkok's broader transportation infrastructure framework, supporting Thailand's long-term urban mobility goals.

CONCLUSION

ARL connecting Suvarnabhumi Airport to central Bangkok, requires strategic enhancement to meet Thailand's growing tourism demands and urban transit challenges. The service must evolve to address diverse passenger needs, particularly focusing on independent international travelers through optimized station facilities, enhanced baggage handling, and improved intermodal connectivity. The development strategy encompasses innovative pricing mechanisms, including tourist membership programs, alongside comprehensive service quality improvements. Priority must be given to optimizing operational efficiency, particularly station dwell times and transfer processes. These enhancements aim to create positive passenger experiences that encourage service reuse while contributing to Bangkok's sustainable mass transit development and Thailand's broader tourism infrastructure objectives.

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Institutional Review Board Statement: This research was approved by the Ethics committee No. ECNIDA 2022/0140.

Informed Consent Statement: The participants have been asked to read the consent form carefully. If they agreeed with the consent form, then they have asked to sing the form.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

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THE ROLE OF ETHNIC TOURISM IN PRESERVING KAZAKHSTAN'S CULTURAL HERITAGE AND LOCAL TRADITIONS: LITERATURE REVIEW

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Abstract: This study investigates ethnic tourism's role in preserving cultural heritage and local traditions in Kazakhstan, assessing both benefits and challenges. Materials and Methods – a systematic literature review (SLR) gathered data from Google Scholar, ResearchGate, and Scopus, focusing on empirical studies from 2019 onward on ethnic tourism and cultural heritage preservation. Results and Discussions – the findings indicated that ethnic tourism supported cultural preservation by promoting traditional practices and aiding local communities. However, challenges like limited infrastructure and the commercialisation of culture risk the authenticity and sustainability of these efforts. Ethnic tourism in Kazakhstan plays a crucial role in preserving cultural heritage by offering immersive experiences in local communities' traditions, customs, and socio-cultural aspects. This approach fosters economic development and strengthens national identity and consciousness. The growth of ethnic tourism brings numerous benefits, such as increased income for local communities, diversification of the economy, infrastructure improvements, and the reinforcement of ethnic identity. Additionally, it promotes intercultural understanding and dialogue, contributing to a broader appreciation of cultural diversity. However, challenges accompany this growth. Ethnic tourism can sometimes lead to losing traditional skills, shifts in social behaviour, and potential land conflicts. Inequitable distribution of tourism benefits may exacerbate these issues. Furthermore, over-commercialisation is risky, which can dilute cultural authenticity and erode local traditions. Despite these challenges, ethnic tourism typically has a lower environmental impact. It attracts visitors to less crowded areas, encourages environmental conservation, and supports eco-friendly initiatives. Sustainably managed ethnic tourism can enhance cultural heritage preservation by fostering respect for local traditions while minimising commercialisation risks. By integrating community participation and equitable benefit-sharing, ethnic tourism can empower local populations and ensure long-term viability. Additionally, incorporating environmental sustainability into tourism practices can further protect natural and cultural resources for future generations.

Keywords: ethnic tourism, preservation of cultural heritage, Kazakhstan, local traditions, sustainable tourism, impact of cultural tourism

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INTRODUCTION

Analyzing the role of ethnic tourism in Kazakhstan is crucial now due to the rapid globalization and modernization affecting many traditional cultures. As cultural practices and languages face the risk of dilution or loss, ethnic tourism emerges as a valuable means to support and revitalize these cultural elements, making the analysis timely and relevant. After the collapse of the Soviet Union and gaining independence, the main task for Kazakhstan was nation-building (Qiu et al., 2022). The preservation of national cultural heritage and local traditions plays a significant role in this process, which has become an essential component of the country's identification in the international arena. One of the most effective tools for preserving cultural heritage is the development of ethnic tourism, which allows not only the promotion of unique traditions and rituals but also the contribution to their preservation and reproduction. The abrupt end of the Soviet policy of nationalities and its legacy of multinational states created challenging conditions for nation-building in Kazakhstan.

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However, multinationalism and multiculturalism have become the basis for the development of ethnic tourism, which allows the region to showcase its cultural richness and diversity. Ethnic tourism also helps restore the titular nationality's lost position, preserving its traditions by engaging tourists in authentic cultural practices (Van, 2024; Stankov et al., 2023).

Another important aspect is the revival of the culture of Kazakhstan's nomadic peoples, an essential area of ethnic tourism. The traditions of nomadic lifestyle, folk crafts, national cuisine, folklore and music have become popular among tourists, contributing to their preservation and transmission to future generations (Zandieh & Seifpour, 2020). Local culture becomes the basis of national identity, and ethnic tourism helps to maintain this link between the past and the future.

After its independence, Kazakhstan actively worked to create a new national policy, including forming a national identity and a vision of its history. This process inevitably involved cultural heritage. Ethnic tourism can bring economic benefits by promoting local businesses, crafts, and tourism, thus enhancing the living standards of indigenous communities. Furthermore, it fosters mutual understanding and respect for diverse cultures, leading to a more inclusive society that values cultural diversity. Ethnic tourism has become a tool for promoting unique traditions and ensuring their preservation in the context of globalization and the country's integration into international economic and political systems (Văduva et al., 2021; Turalin et al., 2023). Researching ethnic tourism within the Kazakh context contributes to broader knowledge in cultural studies, tourism, and sustainable development. It provides a case study on balancing tourism development with cultural preservation, a significant challenge in cultural tourism research. However, the challenges associated with the transition to a market economy have reduced funding for the cultural sector, making it challenging to preserve centuries-old traditions. In this situation, the development of ethnic tourism has become one of the ways to support the cultural environment. Tourist interest in local customs contributes to preserving folk crafts, music and dance traditions, and traditional lifestyles, which could disappear without proper support. Since gaining independence, Kazakhstan has faced numerous challenges, including preserving its cultural heritage and developing its national identity. One of the critical aspects of this process has been the role of ethnic tourism in reviving and maintaining local traditions and cultural heritage.

In particular, after the collapse of the Soviet Union, there was a massive outflow of the Russian population to Russia, which led to a significant reduction in the number of qualified personnel in the cultural sector. At the same time, the material and technical base of cultural institutions was destroyed, making their work more difficult. Many cultural institutions were closed due to economic difficulties and inflation, which led to a decline in the country's cultural life level.

While ethnic tourism is widely studied, there is limited research on its specific impacts on Kazakhstan's cultural heritage. This gap in literature calls for more in-depth analysis to understand the unique challenges and advantages Kazakhstan faces in using tourism as a preservation tool. Despite these challenges, ethnic tourism can become a tool for preserving Kazakhstan's cultural heritage. The unique national culture, traditions and rituals of the Kazakh people can attract the interest of tourists from all over the world, contributing not only to the region's economic development but also to the revival of local cultural traditions. Local communities involved in ethnic tourism can revive ancient crafts, preserve language, music and dance, and pass this knowledge on to future generations. This article aims to highlight one of the main directions of the cultural policy of independent Kazakhstan: the revival of national culture. In this context, an important task is to preserve ethnic identity and develop tourism aimed at introducing the culture of the indigenous population, in particular, the nomadic traditions of the Kazakhs. Creating cultural centres and museums and organising ethno-tours helps not only to preserve cultural heritage but also to promote it internationally. In addition, the purpose of the study is to explore in depth the potential of ethnographic tourism in Kazakhstan, identify its current state, main problems and ways of sustainable development, which will ensure the cultural integrity of the country and a sustainable economic effect from tourism. This research can reveal specific strategies for safeguarding cultural practices, assess the effectiveness of ethnic tourism initiatives, and offer insights into the sustainable management of cultural heritage sites.

Research Focus

The primary purpose of this study is to assess how ethnic tourism supports cultural heritage preservation in Kazakhstan, emphasizing the dual impact on local communities and national identity. The authors examine the positive contributions and potential challenges ethnic tourism brings to maintaining cultural authenticity and fostering sustainable practices within Kazakh traditions.

Research Aim and Research Questions

This study aims to evaluate ethnic tourism's impact on the preservation of cultural heritage in Kazakhstan, explore how it aids in protecting local traditions, and identify strategies for sustainable growth.

Research Questions

1. How does ethnic tourism contribute to cultural preservation in Kazakhstan?
2. What are the benefits and challenges local communities face in ethnic tourism?
3. What strategies can improve the sustainability and authenticity of ethnic tourism in Kazakhstan?

LITERATURE REVIEW

Ethnic tourism is critical in preserving Kazakhstan's cultural heritage, sparking renewed interest in historical and cultural sites. Aldybayev et al. (2021) supports this, noting that ethnic tourism revives both public and governmental interest in these sites. This revival is beneficial for maintaining the integrity of cultural sites and educating visitors on the country's rich heritage. Post-independence, Kazakhstan established a structured approach to cultural preservation with the 1992 Law on the Protection and Use of Historical and Cultural Heritage. This law, highlighted by Auganbai et al. (2020), established the groundwork for using cultural monuments as part of the ethno-cultural environment. Such legal

structures enable the development of ethnic tourism by prioritizing the conservation and promotion of cultural sites. The literature also emphasizes the educational potential of heritage sites. Chang (2019) notes that Kazakhstan's cultural monument utilization extends beyond tourism. It also serves to educate the public and foster local traditions. This educational aspect enhances local pride and allows tourists to engage more deeply with Kazakh history and culture.

The development of museums and cultural institutions further supports Kazakhstan's efforts in ethnic tourism. Alzhanova et al. (2024) describe how these institutions, such as the museum of the Golden Man, have become symbols of national pride. This strategy draws international visitors and strengthens Kazakhstan's cultural identity by showcasing unique artefacts and historical discoveries. Emphasizing historical figures, like Kazakh batyrs Kabanbai and Bogenbai, is another strategy that merges national pride with tourism. Zhiltsov & Zonn (2019) argue that promoting such figures is instrumental in boosting national consciousness and attracting ethnic tourism centred on local heroes. This type of tourism focuses on the narratives of these figures, blending heritage tourism with historical education. Ethnic tourism contributes to Kazakhstan's economic landscape and strengthens its cultural identity. Uniting communities around shared history and traditions supports socio-economic development and national cohesion. Kudaibergenova & Laruelle (2022) introduce the concept of "state-supported primordialism," which describes Kazakhstan's intentional revival of pre-Soviet history while subtly distancing itself from Soviet influence. This approach reinforces the country's national identity and provides a basis for attracting tourists interested in its unique cultural narratives. After gaining independence, Kazakhstan began to reshape its national identity, emphasizing pre-Soviet historiography and national culture. As noted by Kudaibergenova (2018), this period saw the introduction of new textbooks focusing on pre-Soviet history. However, Tiberghien (2019) points out that those Soviet-style nation-building methods continue to influence Kazakhstan's cultural policy, which is visible in repurposing former Soviet monument sites for new national symbols. This continuity and change illustrate the complex relationship between past Soviet ideologies and current Kazakh nationalism.

According to Aldybayev et al. (2021), post-Soviet Kazakhstan replaced the "laboratory of friendship of peoples" ideology with a focus on Kazakh folklore and national culture. This shift aims to strengthen the national identity by reviving indigenous cultural practices. However, they also raise the question of whether the Soviet ideology of multiculturalism, under the banner of "friendship of peoples," has disappeared. This underscores a nuanced continuity where elements of Soviet-era multicultural ideals persist, though refashioned to suit a new nationalistic narrative.

The Assembly of the People of Kazakhstan, as described by Seken et al. (2019), aims to foster national unity and social harmony by promoting Kazakh patriotism and civic cohesion. This approach is closely aligned with Nazarbayev's vision of a unified Kazakh identity while maintaining the cultural plurality of various ethnic groups. Amangosov et al. (2024) highlight that this body reflects Soviet-era multicultural rhetoric, though now positioned within an independent nation-building framework. The Assembly promotes each ethnic group's right to preserve its heritage, offering an institutional base for cultural events, which has implications for cultural policy and ethnic tourism.

Establishing non-governmental cultural institutions in the 1990s marked a crucial development in Kazakhstan's cultural sphere. Abdraimov & Sadykov (2023) emphasize the importance of these institutions for promoting cultural exchange and preserving cultural assets within Kazakhstan. This regulatory shift reflects the country's commitment to fostering a self-sustaining cultural sector while controlling cultural property export and supporting international cultural engagement, paving the way for local and global recognition of Kazakh heritage. Ualtaeva & Pernekulova (2020) examine ethnic tourism's impact, noting that it helps to revitalize and sustain local cultural practices, such as language, religion, crafts, and traditional music, supporting the identity-building process. By showcasing elements like Kazakh folk dances, cuisine, and Islamic heritage sites, ethnic tourism fosters national pride and contributes economically to local communities. The restoration of religious and historical sites, like mosques and madrassas, underlines Kazakhstan's dedication to spiritual and cultural preservation, which appeals to both domestic and international visitors interested in Kazakh heritage (Agyeiwaah & McKercher, 2024). Existing literature illustrates that Kazakhstan's cultural policies post-independence have embraced a dual approach: fostering a unified national identity rooted in indigenous heritage while preserving the multicultural aspects shaped by the Soviet period. Ethnic tourism is a crucial instrument in this approach, as it supports cultural preservation and economic development and addresses broader goals of national unity and identity. The state actively supports the development of ethnic tourism by organizing national festivals and cultural events and preserving historical sites. Cultural institutions are essential in promoting art and culture and have become critical elements in national consciousness.

MATERIALS AND METHODS

The section describes the methodology used in this study, specifically employing a Systematic Literature Review (SLR) to analyze the role of ethnic tourism in preserving Kazakhstan's cultural heritage. The primary research objects include scientific articles published from 2019 onward, which focus on the impact of ethnic tourism on the preservation of cultural heritage and local traditions in Kazakhstan. This analysis considers several thematic areas, including the preservation of cultural heritage, traditions of local communities, the growth of ethnic tourism, and sustainable tourism practices. Only publications containing empirical data or employing quantitative or qualitative methods to assess tourism's impact have been included for the methodological approach. While the geographical focus of this research is on Kazakhstan, studies covering other Central Asian countries have also been reviewed for comparative insights (Figure 1).

Planning Phase

Objective of Study

The purpose of this study is to assess the role of ethnic tourism in preserving Kazakhstan's cultural heritage and local traditions by analyzing previous research to identify key trends, challenges, and potential impacts.

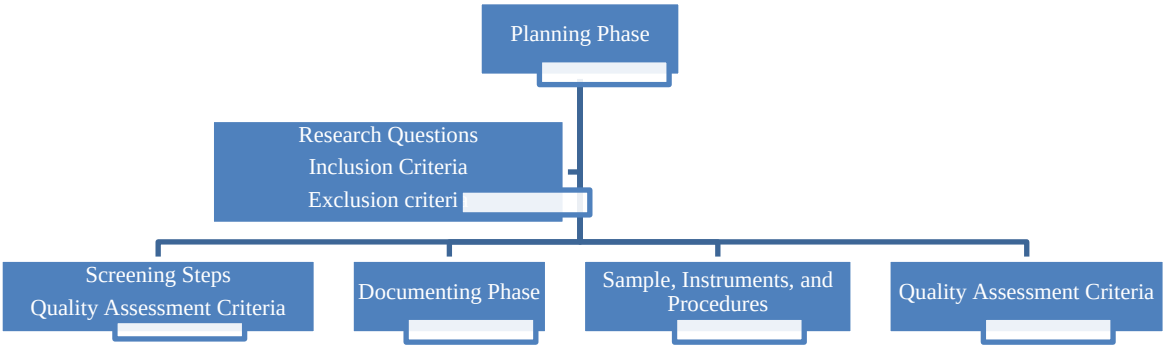


Figure 1. The flow chart of methodology steps (Source: Author's development)

Research Questions

1. How does ethnic tourism affect the preservation of Kazakhstan's cultural heritage and traditions?
2. What are the main challenges facing ethnic tourism in this context?
3. What initiatives can support the development of ethnic tourism in Kazakhstan to preserve cultural heritage?

Inclusion Criteria

1. Publications related to ethnic tourism and cultural heritage preservation.
2. Studies analyzing the impact of ethnic tourism on local traditions and communities.

Publications covering research conducted after 2019 and containing empirical data (Table 1).

Table 1. Publications featuring research conducted post-2019 and presenting empirical data (Source: Author's development)

Source	Reliability Assessment	Methodology Quality Assessment
Bashynska et al. (2019)	Relies on recent technology trends and primary data on internet marketing, enhancing relevance to current digital marketing practices.	The study uses descriptive methodology; limited data analysis could impact depth of findings.
Bielialov, & Namliiev (2024)	Explores the link between national tourism flows and macroeconomic development, and reflects the socio-economic role of tourism in national economies.	Applies production function modeling, regression, and correlation analysis using statistical software; modeling complexity may limit accessibility.
Fan (2024)	Addresses inter-ethnic tourism conflicts relevant to diverse cultural contexts, ensuring relevance.	Uses conflict resolution models; a mixed-methods approach could add robustness.
García-Soto et al. (2024)	Reliable due to focus on co-ethnic community contributions; current data adds relevance.	The case study methodology focuses on immigrant entrepreneurs but is limited in applicability beyond specific demographics.
Carvalho & Ivanov (2024)	Timely insights on AI in tourism; highly relevant with potential industry implications.	It uses a conceptual framework without empirical data, limiting quantitative validation.
Hu (2024)	It focuses on empowerment in ethnic tourism, using reliable data for policy relevance.	Employs case studies in human resources, though further quantitative analysis could improve accuracy.
Jie et al. (2024)	High reliability with a systematic review method covering perceptions of ethnic tourism is a key strength.	Rigorous methodology with a comprehensive review, though limited primary data integration.
Kovshun et al. (2023a)	Provides comprehensive analysis with recent data on ecological footprint, which aligns with sustainable development indicators.	It employs quantitative analysis and established footprint measurement metrics, adding to its methodological rigour.
Kovshun et al. (2023b)	Reliable due to updated data and a clear focus on rural tourism's role in economic development.	Utilizes mixed methods (survey and statistical analysis), though the regional focus may limit generalizability.
Mahmudin (2024)	Reliable focus on sustainable tourism and local economic impact, grounded in recent data.	Employs quantitative metrics on economic growth, though limited to specific local contexts.
Mukatova et al. (2024)	It uses qualitative data on resident attitudes toward ethno-tourism, which is relevant for local cultural impact studies.	Robust qualitative methodology with resident surveys; however, generalizability to broader contexts is limited.
Maxsudovich (2024)	Data on visitor demographics in Uzbekistan is recent, providing a current view of trends.	Descriptive statistical analysis and deeper analytical models would strengthen conclusions.
Parfinenko et al. (2019)	Supports long-term planning of sustainable tourism through strategic management.	Applies a conceptual and strategic framework for analysis; although lacking empirical data sets, it is structured and policy-relevant.
Prokopenko et al. (2019)	It focuses on a digital toolkit with implications for current marketing practices; data source reliability is noted.	It lacks detailed statistical validation, but the conceptual framework offers valuable insights into marketing tools.
Prokopenko et al. (2020)	Relies on primary data and case studies to support claims, making it relevant and credible.	The case study methodology is practical, yet the narrow focus may limit broader applicability.
Rather (2024)	Focuses on AI applications with relevant theoretical propositions for the hospitality sector.	It uses a theoretical framework but needs more empirical data, impacting practical application validation.
Saienko et al. (2020)	Empirically grounded, utilizing real-world tourism operator data in Ukraine, enhancing reliability.	The methodology is thorough, with a structured approach to evaluating efficiency; however, applicability may be geographically limited.
Suryani (2024)	Reviews sustainable cultural tourism trends; reliable due to comprehensive trend analysis.	Employs literature review; lacks primary data, though secondary analysis is thorough.
Sushchenko et al. (2023)	Vital source due to integrating urban transport and tourism with data on logistical frameworks.	Multi-perspective methodology adds robustness, though the emphasis on local development may narrow findings.

Troian et al. (2023)	Combines historical and empirical data on marine tourism, enhancing credibility.	The systematic review approach ensures comprehend-siveness, though it lacks in-depth quantitative analysis.
Yang & Wall (2023)	Discusses ethnic tourism challenges with a balanced perspective on impacts, enhancing reliability.	Broad systematic review approach; a lack of region-specific data may limit depth for specific contexts.
Yang et al. (2023)	High reliability due to cross-community perspectives on tourism quality of life.	It uses qualitative methods with community surveys; it is broad but lacks deep statistical validation.
Zaiachkovska et al. (2021)	Explores the impact of the global perfume market on tourism flows, presenting relevant economic-cultural links.	Applies economic analysis with market indicators; limited primary data reduces empirical depth.

Exclusion criteria include publications published before two thousand and nineteen, review articles that lack empirical data, and publications written in languages other than English. During the conducting phase, literature searches will be carried out using Google Scholar, ResearchGate, and Scopus databases. The keywords guiding this search are “ethnic tourism,” “preservation of cultural heritage,” “Kazakhstan,” “local traditions,” “sustainable tourism,” and “impact of cultural tourism” Screening Process (Table 2).

Table 2. The process of literature screening (Source: Author's development)

Stage	Number of Publications
Initial number of publications found	310
Publications meeting inclusion criteria	110
Excluded duplicate publications	50
Final selection for analysis	60

Screening Steps

- Step 1: Search by keywords in the selected databases.
- Step 2: Literature selection based on inclusion and exclusion criteria.
- Step 3: Check each publication for duplication.

Quality Assessment Criteria

- Removal of duplicates: All duplicate publications were removed to ensure unique results.
- Reliability of results: Each article's methodological reliability was assessed.
- Clarity of research goals and objectives: Articles were checked for clearly defined research questions and hypotheses.
- Description of methodology for replicability: Selected publications included a detailed methodology to allow for study replication (Table 3).

Table 3. Application of the methodology in the form of a table (Source: Author's development)

Quality criterion	Assessment process	Result
Removal of duplicates	Automatic deletion in the data storage system	All duplicates removed
Reliability of results	Evaluation of methodology and statistical data of each article	85 articles were compliant
Clarity of aims and objectives	Manual check for clear aims	70 articles retained after review
Repeatability of the described methodology	Assessment of the detail of the methodology	60 articles passed this stage

Documenting Phase

Critical data were extracted from each source, including the author, year of publication, main conclusions, research method, and critical results. The data from the selected literature were then analysed to identify common themes and trends in research on ethnic tourism and the preservation of cultural heritage in Kazakhstan.

Sample, Instruments, and Procedures

The sample consisted of scholarly publications that met the inclusion criteria. The systematic literature review protocol was used to collect, evaluate, and analyse the selected literature. Data storage and analysis tools included Excel, which was used for data structuring, and NVivo, which was employed for qualitative analysis to identify thematic connections within the text.

Quality Assessment Criteria

All duplicate articles were removed, ensuring a refined selection of sources. Quality assessment criteria included the reliability of conclusions, the clarity of research goals and objectives, and a detailed description of methodology that enables replication of the study.

RESULTS AND DISCUSSION

Ethnic tourism, often used alongside terms such as cultural tourism or heritage tourism, emphasises authentic and direct interaction with local communities. This type of tourism aims to help travellers gain a deeper understanding of the daily life, customs, traditions and socio-cultural characteristics of the people of Kazakhstan. For tourists, it is a unique opportunity to go beyond traditional routes and explore the country's cultural values, which is an essential factor in preserving cultural heritage. For residents, ethnic tourism is becoming an opportunity to preserve their customs and to benefit economically from such activities. Given the rapid globalisation and the desire of many nations to preserve their national identity, ethnic tourism is of great importance to Kazakhstan. This type of tourism contributes to the preservation of unique traditions and customs that form the basis of the country's cultural heritage. The study approaches this issue comprehensively, considering the interrelated aspects of ethnic tourism (Table 4).

Table 4. Interrelated aspects of ethnic tourism (Source: Author's development)

Economic aspect	Ethnic tourism creates new opportunities for local communities to generate additional income by developing crafts, local services and souvenir businesses. This type of tourism allows residents to support their region's economy by developing local initiatives and preserving heritage in a globalised world.
Socio-cultural aspect	As Kazakhstan rapidly modernises, many traditions risk disappearing. Ethnic tourism can encourage local communities to preserve and revive their traditions. In this way, authentic cultural practices survive and become a source of national pride and respect for heritage.
Educational aspect	Ethnic tourism provides a deeper understanding of a region's history, anthropology, and culture, offering tourists a living-learning experience. At the same time, for residents, interaction with tourists from other countries broadens their horizons, allowing them to better understand global processes and cultural differences.
Environmental aspect	Cultural tourists have a lower environmental impact, as they are more likely to visit less crowded places and are interested in protecting natural resources. Moreover, revenues from such tourism can be used to support environmental initiatives and ensure sustainable tourism development.

Ethnic tourism is being developed in line with Kazakhstan's strategic initiatives, including the Rukhany Zhangyru and Seven Faces of the Great Steppe programmes. These programmes aim to enhance Kazakhstan's international image by promoting its natural wonders and cultural traditions. According to the Concept for the Development of the Tourism Industry for 2023–2029, promoting such initiatives is necessary for economic growth, fostering national unity, and preserving the country's identity (Tleubayeva, 2019). Scientists' research highlights ethnic tourism as a vital tool for preserving and promoting Kazakhstan's culture. According to Wendt (2020), developing ethnic tourism can help preserve traditions, provide income for local communities, and ensure a sustainable future for the country's heritage.

Ethnic tourism, based on the study and appreciation of the cultural and traditional aspects of Indigenous people's lives, can be categorised according to tourists' different goals (Table 5).

Table 5.Tourist goals of ethnic tourism (Source: Kenzhebekov et al., 2021)

Educational eco-tourism	This type of ethnic tourism focuses on spreading knowledge about the culture and traditions of indigenous peoples. Tourists can participate in workshops, lectures and other forms of learning to understand local customs, language and history.
Cultural exchange	Tourists may seek to engage directly with indigenous peoples to share experiences and knowledge. This may include participating in traditional celebrations, ceremonies or crafts.
Adventure tourism	Some tourists see ethnic tourism as an opportunity for active recreation, including hiking, mountaineering, and river rafting, surrounded by traditional cultures. It combines the desire to explore culture with active physical activities.
Social tourism	This aspect of ethnic tourism focuses on supporting local communities. Tourists can participate in charitable projects or initiatives that help indigenous peoples preserve their culture and traditions.
Ecological tourism	This type focuses on preserving the natural environment in which indigenous peoples live. Tourists can learn how traditional practices use natural resources and contribute to the preservation of ecosystems.
Culinary tourism	They explore the traditional cuisine and gastronomy of indigenous peoples. Tourists can learn about cooking methods, traditional dishes, and the specifics of using local products.
Cultural heritage research	Appreciation and documentation of indigenous cultural elements such as music, painting, dance and crafts. Tourists can participate in activities that contribute to the preservation of this heritage.

Tleuberdinova et al. (2024) present a classification of the main types of ethnographic tourism, identifying the primary goals of each type:

- Ethnographic tourism; Educational; Experimental; Pilgrimage; Adventure; Ethnic tourism is based on festivals.

Ethnic tourism, which focuses on studying indigenous cultures and traditions, is vital for preserving and promoting cultural heritage (Troian et al., 2023). This tourism includes tangible and intangible cultural assets passed down across generations and holds historical, cultural, and social value (Halachev, 2024). In Kazakhstan, a diverse cultural heritage shaped by various ethnic groups, including Kazakhs, Uzbeks, Uighurs, and others, contributes significantly to the development of ethnographic tourism. Ethnic tourism, particularly educational ethnographic tourism, allows tourists to gain in-depth knowledge of local traditions and customs. Learning about history and cultural practices helps tourists understand the values behind these heritages, thus supporting their preservation (Cerquetti et al., 2022). Experiential ethnic tourism enables tourists to immerse themselves in local daily life, helping to revive and sustain traditional crafts and arts (Lim et al., 2023). Participation in domestic work and traditional activities enriches tourists and supports local communities by fostering interest in cultural preservation. Pilgrimage and festival-based ethnographic tourism allow tourists to explore Kazakhstan's spiritual heritage. Celebrations like Nauryz help preserve cultural values and foster community unity (Nowicka, 2020). The development of ethnographic tourism in Kazakhstan represents a critical step toward preserving and revitalizing cultural values. Government initiatives to restore historical monuments, such as the mausoleum of Khoja Ahmed Yassaui, reflect the nation's commitment to safeguarding its heritage amid the challenges of globalization (Reeza, 2023).

In this context, transnational initiatives like the restoration of the Silk Road emphasize Kazakhstan's role as a cultural bridge between East and West. The exchange of goods, ideas, and cultural practices fosters mutual understanding and strengthens a shared national identity. Ethnic tourism in Kazakhstan is a vital tool for promoting cultural heritage and a powerful mechanism for preserving and rejuvenating local traditions (Riyadh et al., 2024). Through immersive experiences, interactions, and a deep awareness of diverse cultural identities, Kazakhstan can reconnect with its roots and engage actively in global cultural dialogues. As the world increasingly acknowledges culture as the fourth pillar of sustainable development, Kazakhstan's cultural role is evolving. While the importance of tangible heritage was recognized soon after independence, the role of intangible heritage took longer to be integrated into official policies. Although traditions played a

key role post-independence by fostering a unified national identity, the broader developmental significance of traditional culture was recognized in subsequent years (Devterov et al., 2024). At the same time, this process has been different in Kazakhstan. The development of ethnic tourism has multifaceted aspects, both positive and negative (Table 6).

Table 6. Implications of ethnic tourism development for the country's policy and economy (Source: Author's development)

Positive effects	Economic - increased income and improved living standards; Diversification of the local economy; Foreign currency generation; Improving infrastructure; Strengthening ethnic identity Stimulating intercultural understanding and communication.
Negative effects	Losses are the loss of traditional production skills; Changes in social behaviour and traditional values; Changing attitudes towards visitors (hospitality); Problems with land and other property; Loss of hidden indigenous meanings in traditional cultures.
Causes of negative effects	Fostering misunderstandings of modernisation. Uneven distribution of benefits from tourism development; Identification of minority culture with tourism products; Misunderstanding of the consequences of tourism development; Limits of local authorities.
Comparison of effects	The positive effects are related to the economy, while the negative ones are related to multiculturalism. Positive effects are easily perceived, while negative ones are hidden; Positive effects depend on the degree of negative ones; The costs of ethnic tourism are covered by local minorities; The benefits of tourism belong to outsiders.
Cultural impact	Costs - loss of authenticity in architecture, art, ritual, etc. Benefits - preservation/revival of traditional art and culture.
Social impact	The costs are dehumanization, problems in family and social life; Unacceptable pressure on local hospitality, moral problems; The benefits are the promotion of modernization and women's independence.

The term “traditional” originates from the Latin “traditio,” meaning transmission, indicating the stable nature of traditional culture. Researchers view tradition as a sustaining element in the historical process of identity creation. Cultural identity involves identifying with a distinct and unique (national) traditional culture, which reflects a unique cultural world developed by various peoples (Vainola, 2024). Comparative cultural studies help to highlight specific elements unique to particular cultures and trends that contribute to traditional identity potential (Yurko & Riabtsev, 2024). Tiberghien (2020) discusses the stability of traditions, comparing them to customs, which are historically established norms of social behaviour that endure through generations and are upheld by public opinion. Traditional culture, defined as a set of material and spiritual values created by specific people and reflected in their way of life, is inherited across generations. Tradition can thus be understood over centuries as a harmonized way of living that aligns with the given geographical, climatic, cultural, and historical context. This culture includes rituals, oral folk art, music, dance, and crafts that contribute to the self-identification of ethnic groups. Traditional Kazakh culture is closely linked to the lifestyle of nomadic peoples. The nomadic way of life shaped the spiritual values and worldview of the Kazakh and Kyrgyz peoples, fostering qualities like humility and resilience in challenging conditions (Zhakyp et al., 2023). The demanding lifestyle also influenced child-rearing practices, emphasizing independence, endurance, and knowledge of natural phenomena, crafts, and traditions. Additionally, traditional Kazakh culture emphasizes continuity in the moral and spiritual education of younger generations (Kaliyev, 2023).

Ethnic tourism in Kazakhstan is vital in preserving cultural heritage and local traditions, acting as both an economic contributor and a tool for enhancing national identity (Sadvokassov & Zhumashev, 2023). The globalized world brings added relevance to heritage preservation, as traditional practices risk disappearing. Smagulova & Zharkynbekova (2024) explain that modern cultural development is shifting from merely preserving artefacts to integrating traditions into broader societal aspects, such as embedding cultural norms and values for sustainable development. Through ethnic tourism, ethnic groups in Kazakhstan promote their traditions while sharing them with a broader audience (Bekbossinova et al., 2023).Kazakhstan's wealth of traditional culture, including intangible heritage, forms the foundation for ethnic tourism. In collaboration with international organizations like UNESCO, local authorities are essential in supporting cultural policies promoting tourism and heritage preservation. These efforts contribute to social inclusion and economic growth (Mayuzumi, 2022). The government supports Kazakhstan's tourism development plan. It aims to stimulate tourism with a particular focus on unique cultural experiences. The plan includes infrastructure development, training of service providers and marketing campaigns to attract local and international tourists to ethnographic sites (Table 7).

Table 7. Tourism development plan in Kazakhstan (Source: Tiberghien, 2019)

Maral breeding in Eastern Kazakhstan	It is an integral part of the local culture and offers a unique and promising area for developing ethnic tourism. Maral breeding is a fusion of culture, tradition, welfare, and gastronomy. With proper planning, sustainable practices, and a commitment to authenticity, maral breeding can become an essential attraction for eco-tourists seeking to experience the unparalleled cultural offerings of East Kazakhstan.
Ethnic villages in Kazakhstan	They have a massive potential for developing the country's ethnographic tourism sector. They offer a combination of education, entertainment and cultural immersion, making them attractive to many tourists.
Sivers' apple	The Sievers apple, also known as *Malus sieversii*, is believed to be the ancestor of many modern apples. It grows in the mountainous regions of southern Kazakhstan, especially in the vicinity of Almaty, and is a fruit and a significant part of the region's natural heritage. Celebrating its flowering is a way to honour its aesthetic beauty and historical significance. The blossoming of the Siversa apple trees is a sight to behold. The orchards are covered in a blanket of white and pink, creating a picturesque panorama against the majestic mountains. The apple has a special place in Kazakh folklore and traditions, and the festival is an occasion to delve into these stories, dances, songs and other art forms.
Festivals and events	Kazakhstan hosts a variety of cultural festivals and events dedicated to its heritage. Nauryz Meyrami (Kazakh New Year) and the Shchuchinsk-Borovoye Ski Festival are examples of events that combine tradition with modern celebration.
Historical sights	Work continues on preserving and restoring historical sites such as the mausoleum of Khoja Ahmed Yassaui, the ancient city of Otrar, and the petroglyphs in the Tamgala Gorge, allowing tourists to explore Kazakhstan's past.
Gastronomic tourism	Traditional Kazakh cuisine is a significant part of the cultural heritage. Tourists can taste dishes such as beshbarmak (a meat and noodle dish) and try fermented milk products such as kumys.

The Sacred Kazakhstan Project: This initiative identifies and promotes various holy and historical sites across Kazakhstan. The project ensures the preservation of these sites and encourages domestic and foreign tourists to visit them. Cooperation with international organisations: Kazakhstan cooperates with international organisations such as UNWTO (United et al. Organisation) to develop sustainable ethnographic tourism practices that benefit tourists and local communities. Combined with Kazakhstan's rich diversity of cultures and traditions, these programmes position the country as a unique destination for those seeking an authentic and immersive cultural experience. Next, the authors explore potentially promising areas for the development of ethnographic tourism based on cultural heritage in Kazakhstan.

Preserving the traditional cultural identity of the people of Kazakhstan in the context of globalisation is a crucial challenge for society. Ethnic tourism, given its ability to engage tourists in local cultures and their customs, is becoming a mechanism that helps maintain cultural diversity (Fraser, 2020). It contributes to economic development and provides a platform for intercultural dialogue, encouraging society to recognise its cultural identity (Grubor et al., 2022). Thus, the development of ethnic tourism in Kazakhstan is an essential component of preserving cultural heritage, and this aspect is becoming crucial in shaping sustainable cultural development. Interaction between the state, business, and public sector is essential for implementing projects that promote traditional culture. Ethnic tourism is becoming not only an economic initiative but also an essential step in preserving and enhancing the cultural heritage that forms the identity of the people of Kazakhstan.

CONCLUSION

Ethnic tourism in Kazakhstan plays a crucial role in preserving cultural heritage by providing immersive experiences in local communities' traditions, customs, and socio-cultural aspects. This approach promotes economic development and strengthens national identity and consciousness. The growth of ethnic tourism brings numerous benefits, including increased income for local communities, diversification of the economy, infrastructure improvements, and reinforced ethnic identity. Moreover, it fosters intercultural understanding and dialogue. However, challenges accompany this growth. Ethnic tourism can sometimes result in losing traditional skills, social behaviour shifts, and potential land conflicts. Inequitable distribution of tourism benefits may also amplify these issues. Still, ethnic tourism typically has a lower environmental impact, as it attracts visitors to less crowded areas, encouraging an interest in environmental conservation and support for eco-friendly initiatives.

Ethnic tourism offers a means to revive and preserve cultural practices, instilling national pride in local communities. Its educational potential enables tourists and residents alike to better understand each other's lives, promoting mutual respect. National programs like Ruhany Zhanggyru and Seven Faces of the Great Steppe guide government policies to support ethnic tourism as an economic and cultural development tool. In a globalized world, Kazakhstan's ethnic tourism can be a vital force for preserving cultural diversity and encouraging intercultural dialogue. For sustainable development, collaboration between public, private, and civil sectors is essential, along with involvement from international organizations to support heritage preservation and attract investment. Thus, ethnic tourism in Kazakhstan is economically beneficial and a powerful mechanism for cultural preservation, requiring a coordinated management approach to address contemporary challenges.

Future research on ethnic tourism and cultural rights in Kazakhstan should focus on developing a nuanced understanding of cultural human rights that account for the complexity of modern globalization. Key questions include protecting cultural identity in a world where digital technologies, population mobility, and social structures are rapidly changing. Research should examine how these factors impact access to cultural resources, cultural identity expression, and local heritage preservation.

Additionally, understanding the role of state and non-state institutions in ensuring cultural rights is essential. Research could explore how these institutions might create inclusive policies that provide equal access to cultural resources, particularly for marginalized communities. This also includes examining mechanisms to safeguard cultural rights amid economic and political instability and methods to foster self-identification and inclusion for diverse social groups.

Another critical focus should be developing comprehensive policies for realizing cultural rights on both national and international levels. Future research should consider interdisciplinary approaches to cultural rights to address societal dynamic changes better, balancing cultural preservation with modern development needs. This approach will deepen our understanding of cultural human rights as interconnected social, political, and economic phenomena, helping to create a society where cultural diversity is recognized and actively supported.

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ADOPTION OF TECHNOLOGY: CRITICAL FACTORS INFLUENCING CONSUMERS' INTENTIONS TO USE MOBILE BANKING IN SRI LANKA

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Abstract: Mobile banking plays a crucial role in modern retail banking, particularly in developing countries like Sri Lanka, where financial inclusion remains a key challenge. Despite its potential to enhance convenience, accessibility, and efficiency, adoption rates have been relatively slow due to various influencing factors. This study seeks to examine the critical factors shaping consumers' behavioral intentions toward mobile banking in Sri Lanka within an evolving Financial and technological land scape. A cross-sectional Survey design as employed, gathering data from a diverse sample of bank customers to assess key determinants. The study investigates the effects of social influence, IT innovativeness, performance expectancy, effect expectancy, environmental benefits, and privacy concerns on mobile banking adoption. Structural equation modeling (SEM) was used to analyze the relationships between these factors and to test the proposed conceptual Framework. The findings indicate that social influence, IT innovativeness, and attitudes significantly and positively impact consumers' behavioral intentions toward mobile banking. However, performance expectancy, effect expectancy, environmental benefits, and privacy concerns do not exhibit significant direct effects. Notably, attitudes play a mediating role, fully mediating the impact of performance expectancy and partially mediating the influence of environmental benefits. The proposed model explains 70.32% of the variance in behavioral intentions, demonstrating a strong predictive ability and theoretical contribution. These insights provide valuable implications for financial institutions, policymakers, and technology developers seeking to improve mobile banking adoption. By addressing key drivers and barriers, targeted strategies can be developed to enhance user acceptance, trust, and engagement, ultimately fostering greater financial inclusion and digital transformation in Sri Lanka.

Keywords: mobile banking, UTAUT, consumers adoption, consumers' intentions, banks

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INTRODUCTION

M-banking has emerged as the best and most appealing network for retail bankers, particularly in developing countries. Financial services are more difficult to obtain than in advanced countries (Thusi & Maduku, 2020). The number of mobile devices is growing at an exponential rate, and mobile phones are gaining market share globally (Hayes et al., 2020). Because of advancements in information technology, improvements in internet infrastructure, and the widespread use of mobile phones, many businesses, including banks are beginning to investigate the possibility of selling their goods and services via mobile devices (Shankar et al., 2020).

Accordingly, Banks focus on M-banking practices as the competitive advantage for their market growth. M-banking is a new way to conduct all transactions and provide services using a mobile device such as a cell phone or personal digital assistant. This way of thinking represents a significant paradigm shift in financial services (Giovanis et al., 2019). Mobile banking stands out as the alternative that is the most adaptable, efficient, and cost-effective when compared to the other available choices for the provision of financial services (Rahi et al., 2021).

A key concern for financial institutions is the growing dependence of customers on mobile banking applications to acquire banking services (Jebarajakirthy & Shankar, 2021). As a result, the banking industry has implemented mobile banking to make it easier for customers to complete financial transactions using their mobile devices (Elhajjar & Ouaida, 2019). The increased level of competition in the banking industry has increased the amount of pressure on financial institutions to provide new, more technologically advanced delivery channels (Çelik & Özköse, 2023). One

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example is mobile banking, which most people consider to be the most modern way to conduct online banking (Malaquias & Hwang, 2019). M-banking is a channel through which customers can contact banks using portable electronic devices such as mobile phones to complete banking-related transactions whenever and wherever they want at a lower cost in both time and money (Khattak et al., 2023).

Mobile banking removes the physical constraints of traditional banking, allowing customers to conduct transactions whenever and wherever they want (Hassan & Wood, 2020). Despite the numerous advantages of mobile banking, it is not widely used by retail customers, particularly in developing countries (Shankar et al., 2020). Despite this, mobile banking is still in its infancy in terms of widespread adoption. The concept merits further investigation, particularly in developing countries that have been slow to adopt technological advances (Tsindeliani et al., 2021).

The research on consumers' adoption of M-banking mainly focused on advanced countries. Scholars revealed that the introduction of m-banking has revolutionized the banking industry, providing consumers with the convenience and flexibility to carry out transactions from anywhere at any time (Juma et al., 2022) Despite the potential benefits, the adoption of m- banking among consumers in emerging countries has been relatively low (Finkelstein et al., 2022). Studies revealed that factors such as lack of trust, security concerns, and limited technological infrastructure are some of the barriers hindering the widespread adoption of m-banking in emerging markets (Garg et al., 2023).

The low adoption of m-banking in emerging countries presents a significant gap in the literature, especially as these markets represent a massive potential for growth and development (Dissanayake et al., 2023). Understanding consumers' adoption behavior towards m-banking in emerging countries is crucial in identifying the factors that drive or inhibit the adoption process (Dissanayake et al., 2023). Thus, this study aims to investigate the consumers' adoption of m-banking in emerging countrylike Sri Lanka. The findings of this study provide valuable insights for banks and policymakers to enhance the adoption of m-banking in emerging markets (Finkelstein-Shapiro et al., 2022).

REVIEW OF LITERATURE

1. Underpinning Theory

Several theories have shed light on consumer adoption and use of new technologies such as Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT) and the UTAUT2 (Elhajjar & Ouaida, 2019).

UTAUT2 is considered as a thorough framework that elucidates the elements that impact people's willingness and utilization of technology (Finkelstein-Shapiro et al., 2022). It expands on the UTAUT1 framework by adding four new components: performance expectancy, effort expectancy, social influence, and facilitating conditions. Performance expectancy determines the extent to which users believe that using the technology will improve their work performance (Kitsios et al., 2021). Effort expectancy measures the perceived simplicity of using the technology. Social influence quantifies the impact of social networks on an individual's utilization of the technology (Balyuk & Davydenko, 2023).

Facilitating conditions assesses the availability of resources and assistance in using the technology (Thusi & Maduku, 2020). UTAUT2 model is a widely accepted model that aims to understand and explain individual's intentions to adopt and use technology Despite this, it has faced criticism for failing to incorporate certain key factors such as privacy concerns, personal innovativeness in IT and environmental benefits, that are known to impact technology adoption (Giovanis et al., 2019). For instance, privacy concerns are becoming increasingly important in the digital age, as individuals become more aware of data breaches and potential privacy violations (Zhu & Jin, 2023). Similarly, personal innovativeness in IT refers to an individual's willingness and ability to try new and innovative technologies (Finkelstein-Shapiro et al., 2022).

Some people are naturally more inclined towards innovation and may be more likely to adopt new technologies earlier than others (Ullah et al., 2022). Lastly, environmental benefits associated with IT refer to the positive impact that technology can have on the environment, such as reducing carbon emissions through sustainable technology (Koroleva & Kudryavtseva, 2020). These key factors can affect individuals' intentions and willingness to adopt new technology. Despite this, UTAUT2 does not explicitly account for them (Chouykaew et al., 2024).

To bridge this gap, this study incorporates the variables such as privacy concerns, personal innovativeness in IT (Ashraf & Varela-Neira, 2022), and environmental benefits associated with IT into the comprehensive framework of M-Banking adoption. Several key theories have illuminated the factors influencing consumer adoption and use of new technologies, including the Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), and UTAUT2 (Elhajjar & Ouaida, 2019).

Among these, UTAUT2 stands out as a robust framework that elucidates the elements impacting individuals' willingness to adopt and utilize technology (Raza et al., 2017). It expands on the original UTAUT framework by incorporating four additional components: performance expectancy, effort expectancy, social influence, and facilitating conditions.

- Performance expectancy reflects users' belief that using the technology will enhance their performance.
- Effort expectancy assesses the perceived ease of using the technology.
- Social influence gauges the effect of social networks on technology use.
- Facilitating conditions evaluate the availability of resources and support for using the technology (Thusi & Maduku, 2020). Despite its widespread acceptance, the UTAUT2 model has faced criticism for neglecting several critical factors that can influence technology adoption, including privacy concerns, personal innovativeness in IT, and environmental benefits (Giovanis et al., 2019).

1. Privacy concerns have gained prominence in the digital era, where individuals are increasingly aware of data breaches and privacy violations.

2. Personal innovativeness in IT refers to an individual's propensity to embrace new technologies, with some users being naturally more inclined to adopt innovations earlier than others (Mullan et al., 2017).
3. Environmental benefits associated with technology, such as reducing carbon emissions through sustainable practices, also play a role in influencing adoption decisions (Venkatesh et al., 2003).

Based on the above facts, we have formulated the following hypotheses.

General Objective

To investigate the factors influencing the behavioral intents to adopt M - banking in the Sri Lankan context.

Specific Objectives

1. To examine the influence of Performance Expectancy (PE), Effort Expectancy (EE), and Social Influences (SI) on the behavioral intents to adopt M - banking in the Sri Lankan context.
2. To examine the influence of Privacy Concerns (PC), Personal Innovativeness (PI), and Eco-Benefits (EB) on the behavioral intents to adopt M - banking in the Sri Lankan context.
3. To examine the influence of Attitude (ATT) towards M - banking on the behavioral intents to adopt M - banking in the Sri Lankan context
4. To examine the mediating effect of attitude toward M - banking on the relationship between various factors (Performance Expectancy, Effort Expectancy, Social Influence, Personal innovativeness, Privacy Concerns, and Eco-Benefits) and the behavioral intents to adopt M - banking in the Sri Lankan context

Research Questions

1. Do Performance Expectancy (PE), Effort Expectancy (EE), and Social Influences (SI) influence the behavioral intents to adopt M - banking in the Sri Lankan context?
2. Do Privacy Concerns (PC), Personal Innovativeness (PI), and Eco-Benefits (EB) influence the behavioral intents to adopt M - banking in the Sri Lankan context?
3. Does attitude towards M - banking (ATT) influence the behavioral intents to adopt M - banking in the Sri Lankan context?
4. Does attitude toward M - banking mediate the relationship between various factors (performance expectancy, effort expectancy, social influence, environmental benefits, personal innovativeness, and privacy concerns) and behavioral intents to adopt M - banking in the Sri Lankan context?

Based on the above facts, have formulated the following hypotheses.

H1. Performance expectancy positively influences the behavioural intention to adopt mobile banking.
H2. Effort expectancy positively influences the behavioural intention to adopt mobile banking.
H3. Social influence positively influences the behavioural intention to adopt mobile banking.
H4. Environmental behaviour positively influences the behavioural intention to adopt mobile banking.
H5. Privacy concerns negatively influence the behavioural intention to adopt mobile banking.
H6. Personal innovativeness in IT positively influences the behavioural intention to adopt mobile banking.
H7. Attitude positively influences the behavioural intention to adopt mobile banking.
H8. Attitude towards using mobile banking mediates the association between a) performance expectancy, b) effort expectancy, c) social influence, d) privacy concern, e) personal innovativeness in IT, f) eco-friendliness; and behavioural intention towards mobile banking.

METHODS OF STUDY

Research design

This study employed a casual research approach within a conclusive research design to systematically and effectively address the research questions. The focus of the study is on the factors that influence mobile banking adoption, requiring quantitative data to determine causal relationships between variables. Therefore, a cross-sectional survey strategy was deemed most suitable for this study, as it allows for the collection of data from a diverse sample at a single point in time, facilitating the analysis of relationships among the variables of interest.

1. Context of the Study

The study's context is centered on **banking consumers in Sri Lanka who hold accounts with licensed commercial banks.** To ensure that data was collected from customers who were familiar with their bank's mobile banking services, the researcher asked three screening questions. "Do you have a mobile phone? , "Have a bank account?" and "If yes, "Do you have any awareness related to Mobile Banking?". To enhance comprehension, an outline of various mobile banking activities provided by banks was added, along with examples for each activity. Only respondents who met our screening criteria were considered to proceed with the rest of the survey. Questions were posed regarding customers' educational level, employment position, and employment status to confirm their usage of technology, particularly related to mobile phones. To verify the usability of the technology, respondents were inquired about their educational backgrounds. The educational background section was divided into four categories: G.C.E. (O/L) and below, G.C.E. (A/L),Graduate, and Postgraduate or higher. In this survey, the distribution of respondents based on their educational backgrounds is as follows: 36% Graduates, 25% G.C.E. (A/L), 19% Post Graduates, and 20% below GCE O/L.

2. Sample and survey design

The sample for this study consisted of banking consumers who held accounts with licensed commercial banks in Sri Lanka. To ensure that data was collected from customers who were familiar with their bank's mobile banking services, the researcher asked three screening questions.

"Do you have a mobile phone? "Have a bank account?" and "If yes, "Do you have any awareness related to Mobile Banking?". To enhance comprehension, an outline of various mobile banking activities provided by banks was added, along with examples for each activity. Only respondents who met our screening criteria were considered to proceed with the rest of the survey. Questions were posed regarding customers' educational level, employment position, and employment status to confirm their usage of technology, particularly related to mobile phones. To verify the usability of the technology, respondents were inquired about their educational backgrounds. The educational background section was divided into four categories: G.C.E. (O/L) and below, G.C.E. (A/L), Graduate, and Postgraduate or higher. In this survey, the distribution of respondents based on their educational backgrounds is as follows: 36% Graduates, 25% G.C.E. (A/L), 19% Post Graduates, and 20% below GCE O/L. The distribution is presented in Table 1.

Table1. Summary of Personal Demographic Profile in the Study (n = 345)

Description	Frequency	Percentage
Gender		
Male	189	54.8
Female	156	45.2
Civil Status		
Married	149	43.2
Unmarried	196	56.8
Age		
18-30	210	60.9
31-45	99	28.7
46-60	35	10.1
Above 60	1	0.3
Family Size		
1-3	102	29.6
4-6	219	63.5
Seven and above	24	7.0
Educational Level		
GCE (O/L)	2	0.6
GCE (A/L)	106	30.7
Graduate	137	39.7
Post Graduate OR Higher	100	29
Employment Status		
Studying	116	19.7
Unemployment	14	4.1
Government sector	91	26.4
Semi-government Sector	47	13.6
Private Sector	68	33.6
Self-employed	9	2.6
Employment Position		
Executive Level	40	11.6
Managerial Level	27	7.8
Administrative Level	98	28.4
Clerical Level	19	5.5
Office Assistant	15	4.3
Academic	107	31.0
Professional	21	6.1
Nil	18	5.2
Monthly Income		
Below 50,000	177	51.3
50,000 - 80,000	77	22.3
80,001 - 110,000	36	10.4
110,001 - 140,000	13	3.8
140,001 - 170,000	13	3.8
170,001 - 200,000	11	3.2
Above 200,000	18	5.2

In the selection of respondents in Sri Lanka, a comprehensive process was employed. The survey encompassed all nine provinces of the country, with smaller sampling areas identified within each province based on administration districts. To ensure a representative sample, a thorough population analysis was conducted, considering factors such as population size, as well as age and gender distribution within each final sampling area. The creation of a representative respondent group was achieved through convenience sampling, strategically addressing population, age, gender, and

familiarity factors. The methods of contact involved various approaches, including direct interaction through personal contacts of the researchers, approaching targeted respondents at bank branches, utilizing the assistance of bank staff for direct contact, and engaging with respondents at their workplaces, which included bank customers, university students, teachers, and other public and private employees in Sri Lanka. By employing these methods, a convenience sample of Sri Lankan individuals with bank accounts was successfully reached for the survey.

3. Development of survey measures and instruments

The survey instrument used in this study included items sourced from validated scales, while also considering their relevance to the specific context of the study. To assess the suitability of the instrument, a panel of specialists, including three academics specializing in Business Technology Management disciplines and two senior professionals with extensive experience in mobile banking operations, was formed. This evaluation process helped ensure the quality and appropriateness of the research instrument. The study utilized a structured questionnaire comprising pre-defined closed questions based on documented measures. The survey instrument was organized into two main sections. Section one provides information about the survey to the respondents. It includes a question regarding their consent to participate in the survey. Additionally, it aims to collect information regarding the personal demographic characteristics of the respondents. Section Two is designed to gather information about consumers' behavioral intentions. It focuses on understanding their intentions and preferences related to certain behaviors or actions.

The survey was designed using a closed-ended questionnaire that employed a five-point Likert scale, ranging from strongly disagree to strongly agree. The Likert scale is a widely used psychometric measuring tool in survey research, allowing respondents to indicate their level of agreement with specific statements. It was chosen for the survey questions as it facilitates the measurement of constructs such as satisfaction, which is a psychometric variable, as well as other perceptual measures in the model. Likert scales, along with other attitudinal scales, provide insights into people's attitudes, preferences, and subjective reactions, thus aiding in the design of systems and understanding emotional and preferential responses. The measurement items for each dimension along with relevant literature sources were documented in appendix.

Criteria for Selecting Respondents: Participants were selected based on specific criteria to ensure familiarity with mobile banking services. The criteria included: Total Number of Respondents: 345

1. Age: Respondents had to be 18 years or older.
2. Ownership: Each respondent needed to possess a mobile phone.
3. Bank Account: Respondents were required to have an active account with a licensed commercial bank in Sri Lanka.
4. Awareness: Participants must have a basic understanding of mobile banking services.

4. Pilot Study

To ensure the internal consistency of the study's measures, a pilot test was conducted with bank customers. This involved using statistical techniques such as Cronbach's alpha and item-total correlation analysis to assess the reliability of measurement scales. The midpoint was excluded from the Likert scale based on previous considerations. The pilot test involved 38 bank customers and aimed to evaluate the consistency and coherence of the measurement scales. Cronbach's alpha, which measures how closely related a set of items are, was used to estimate the reliability of the scale. A Cronbach's alpha value above 0.70 is generally considered acceptable for research purposes, and in this study, the coefficient for the constructs exceeded 0.8, indicating acceptable internal consistency.

Researchers also made modifications to certain words in the survey based on feedback from the pilot study participants to ensure ease of response. The survey was conducted in Tamil and English, with respondents given the option to choose their preferred language. To ensure consistency between the two languages, bilingual researchers used a translation and back-translation method.

DATA ANALYSIS

1. Analysis approach

In this study, the researchers used the partial least squares (PLS) technique, which is a variance-based structural equation modelling (SEM) method, to test the hypotheses. PLS was chosen because it is suitable for analyzing complex associations and predicting variance in key target dimensions. The researchers used the Smart PLS 4.0 tool to conduct the PLS-SEM analysis, which consisted of the measurement model and the structural model. The measurement model assessed the reliability and validity of the indicators and constructs, while the structural model examined the relationships between the constructs and tested the hypothesized paths. The researchers used this approach to comprehensively analyze the associations and explain the variance in the dimensions of interest.

2. Common method bias

To address common method bias (CMB), both statistical and procedural solutions were implemented. One statistical solution was Harman's single-factor test, which checks whether a single factor explains most of the variation in the measured variables, indicating potential bias. The researchers conducted this test and found that no single component emerged, suggesting that CMB is not a concern. In addition to statistical measures, procedural safeguards were implemented, such as assuring respondents of confidentiality and anonymity, emphasizing the importance of genuine responses, and allowing participants to discontinue the survey if desired. By considering both statistical and procedural measures, the researchers addressed the potential issue of CMB.

3. Assessment of the measurement model

The conceptual model used in this study consists of reflective measurement models, and the criteria for evaluating these models are summarized in Table 2. The researchers ensured that all the requirements for model evaluation were met, indicating strong reliability and convergent validity of the model. Table 2 shows that each independent variable's factor loading, Cronbach's alpha, and composite reliability values were above 0.7. These values indicate that the measurement indicators effectively capture and assess each construct (Hair et al., 2013).

Table 2. Summary of the measurement model

Construct	Statements	Factor Loading
Performance Expectancy (PE) α= .920, CR =.925, AVE =.758	Using mobile banking services can save time for me.	0.883
	Mobile banking allows me to conduct transactions at my convenience.	0.884
	Using mobile banking enables me to accomplish tasks more quickly.	0.824
	I believe that using mobile banking will improve my performance	0.859
	I think mobile banking helps me to carry the banking-related tasks effectively	0.902
Effort Expectancy (EE) α= .946, CR = .947, AVE = .823	I would find the mobile banking system easy to use	0.922
	It would be easy for me to become skillful at using mobile banking	0.912
	Registering a mobile banking service is easy for me	0.921
	Learning to operate the mobile banking system is easy for me	0.893
	My interaction with the system would be clear and understandable	0.886
Social Influence (SI) α=.877, CR=.883, AVE=.669	Many people in my life believe I should use mobile banking	0.779
	People who are important to me think that I should use the mobile banking system	0.818
	The bank's staff members have been helpful in the use of the mobile banking system.	0.828
	In general, the bank has supported using the mobile banking system.	0.838
	Mobile banking enables me to maintain a professional image	0.824
Environmental Benefits (EB) α=.937, CR=.937, AVE=.798	The usage of mobile banking reduces consumers' travels	0.913
	The usage of mobile banking is considered the environmentally sensitive practice	0.893
	The usage of mobile banking reduces paper works	0.916
	The usage of mobile banking reduces the energy consumption of bank	0.886
	Overall, usage of mobile banking minimizes the Co_2 emission levels	0.858
Privacy Concern (PC), α=.891, CR=.914, AVE=.639	Disclosure of my personal information to banks irritates me	0.795
	I am concerned that others may continuously track my current location	0.851
	Banks are gathering an excessive amount of data about me	0.856
	Banks may not keep my private information in a secure way	0.766
	My data can be misused by banks employees	0.720
	I believe that the most critical issue affecting mobile banking is privacy	0.799
Personnel Innovativeness in IT (PI) α=.932, CR=.945, AVE = .788	I am always interested in new technology	0.914
	I frequently look for new information technology	0.930
	If I heard about new information technology, I would try it out.	0.921
	Among my peers, I am the first to adopt new information technology.	0.757
	I am always accepting of new information technologies	0.906
Attitude toward using mobile banking (AT) α=.946, CR=.948, AVE=.824	Using mobile banking is pleasant	0.911
	Mobile banking is desirable	0.882
	Using mobile banking is an advisable move	0.912
	Mobile banking is advantageous for me	0.923
	Mobile banking is an excellent fit for my personality.	0.909
Behavioural Intention (BI) α= .956, CR=.956, AVE=.850	I plan to utilize mobile banking services in the future	0.925
	I believe my interest in mobile banking will increase in the future	0.911
	I plan to continue to use mobile banking frequently	0.936
	I will say good things about mobile banking that works	0.932
	I am likely to make full use of all mobile banking features	0.906

Notes: α=Cronbach's Alpha, CR=Construct Reliability, AVE=Average Variance Extracted

Table 3. Fornell–Larcker criterion analysis for checking discriminant validity

	AT	BI	EB	EE	PC	PE	PI	SI
AT	0.908[a]							
BI	0.810	0.922[a]						
EB	0.780	0.706	0.893[a]					
EE	0.760	0.714	0.826	0.907[a]				
PC	0.233	0.234	0.244	0.262	0.799[a]			
PE	0.731	0.674	0.734	0.773	0.182	0.871[a]		
PI	0.762	0.710	0.691	0.675	0.346	0.636	0.888[a]	
SI	0.674	0.666	0.650	0.677	0.204	0.675	0.608	0.818[a]

Notes 1: [a] Diagonal value indicates the square root of AVE of an individual latent construct.

Notes2: AT: Attitude toward using mobile banking, BI: Behavioural Intention, EB: Environmental Benefits, EE: Effort Expectancy, PC: Privacy Concern, PE: Performance Expectancy, PI: Personnel Innovativeness in IT, SI: Social Influence

A factor loading above 0.7 suggests the indicator strongly relates to its corresponding construct. Moreover, Cronbach's alpha and composite reliability values above 0.7 indicate good internal consistency and reliability of the measurement scales. By meeting these criteria, the researchers ensured that the measurement model had strong reliability and convergent validity, providing confidence in the assessment of the constructs in the study.

The average variance extracted (AVE) for each construct in the study ranges from 0.607 to 0.728, surpassing the minimum requirement of 0.5 (Götz et al., 2010). This indicates that each latent construct shares a larger proportion of variance (50% or more) with its indicators compared to the indicators of other latent variables.

The findings support the internal consistency and convergent validity of the measurement model as a whole (Hair et al., 2013). AVE is a measure of the amount of variance captured by a construct about the measurement error. A higher AVE value indicates that the construct accounts for a substantial portion of the variance observed in its indicators, thereby demonstrating convergent validity. By meeting the AVE requirements and demonstrating internal consistency and convergent validity, the researchers have strengthened the validity of the measurement model. These results indicate that the study's constructs are reliable and effectively capture the underlying concepts they represent.

The measures' discriminant validity was assessed following the approach suggested by Fornell & Larcker, 1981). Examination of Table 3 indicated that the square root of the Average Variance Extracted (AVE) for each construct (located on the upper diagonal) exceeded the corresponding off-diagonal correlation coefficients. This observation suggests that the scales demonstrated discriminant validity, as per the criteria outlined by Fornell & Larcker, 1981).

Furthermore, as indicated in the results shown in Table 4, all heterotrait–monotrait (HTMT) values fell below the more stringent threshold of 0.85/0.9 as recommended by (Henseler et al., 2015). Consequently, it can be inferred that there is adequate discriminant validity among the constructs, in line with the criteria proposed by Hair et al., 2013. In other words, the indicators of each construct are not significantly linked with those of the other constructs in the model.

Table 4. Results of HTMT analysis

	AT	BI	EB	EE	PC	PE	PI	SI
AT								
BI	0.851							
EB	0.827	0.745						
EE	0.802	0.749	0.877					
PC	0.232	0.232	0.242	0.260				
PE	0.778	0.713	0.785	0.824	0.174			
PI	0.802	0.746	0.729	0.708	0.366	0.676		
SI	0.731	0.720	0.708	0.736	0.222	0.741	0.665	

Notes: AT: Attitude toward using mobile banking, BI: Behavioural Intention, EB: Environmental Benefits, EE: Effort Expectancy, PC: Privacy Concern, PE: Performance Expectancy, PI: Personnel Innovativeness in IT, SI: Social Influence

4. Assessment of structural model and hypothesis testing

In this section, the formulated hypotheses were examined through both direct and indirect effect testing. For assessing the statistical significance of the path coefficients, we employed bootstrapping with 2,000 resamples to derive standard errors and t-statistics. The Variance Inflation Factor (VIF) values for the suggested model were below the established threshold of 5.0, signifying the absence of multicollinearity in the model. The results of the proposed model are detailed in Table 5.

Table 5. Results of the Structural Model

Hypothesis	Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics	P values	Decision
H1	PE→BI	0.033	0.033	0.061	0.543	0.587	Not Support
H2	EE→ BI	0.109	0.113	0.076	1.43	0.153	Not support
H3	SI→ BI	0.144	0.145	0.058	2.481	0.013	Support
H4	EB→ BI	0.026	0.033	0.072	0.363	0.716	Not Support
H5	PC→ BI	0.002	0.001	0.029	0.062	0.951	Not support
H6	PI→ BI	0.15	0.151	0.056	2.681	0.007	Support
H7	AT→BI	0.471	0.458	0.089	5.296	0.000	Support
Mediation effect							
H8a	PE→AT→BI	0.088	0.085	0.04	2.184	0.029	Full Mediation
H8b	EE→AT→BI	0.073	0.069	0.039	1.861	0.063	No Mediation
H8c	SI→AT→BI	0.054	0.051	0.028	1.965	0.049	Partial Mediation
H8d	EB→AT→ BI	0.129	0.126	0.043	2.978	0.003	Full Mediation
H8e	PC→AT→ BI	-0.016	-0.014	0.013	1.226	0.22	No Mediation
H8f	PI→AT→BI	0.171	0.166	0.051	3.328	0.001	Partial Mediation

Notes: AT: Attitude toward using mobile banking, BI: Behavioural Intention, EB: Environmental Benefits, EE: Effort Expectancy, PC: Privacy Concern, PE: Performance Expectancy, PI: Personnel Innovativeness in IT, SI: Social Influence

As per the result of Table 5, social influence (β=0.144, t=2.481, p=0.013), Personnel Innovativeness in IT (β=0.15, t=2.681, p=0.007) and attitude toward using mobile banking (β=0.15, t=2.681, p=0.007) have a significant and positive

impact on behavioural intention. Thus, H3, H6 and H7 were supported. However, behavioural intention was not statistically and significantly influenced by performance expectancy (β=0.033, t=543, p=0.587), effect expectancy (β=0.19, t=1.43, p=0.153), environmental benefits (β=0.026, t=0.363, p=0.716) and privacy concern (β=0.002, t=0.62, p=0.951). Therefore, H1, H2, H4 and H5 were not supported. Besides, the researcher(s) test the mediation effect of attitude in between dependent and independent variables of the study. The findings revealed that, apart from effort expectancy and privacy concern, all other variables, such as performance expectancy, social influence, environmental benefits, and personnel innovations in IT were mediated by attitudes towards using mobile banking.

Further, Table 5 and Figure 1 gives an outline of the mediation's effects. In conformity with the findings of Table 5, attitudes towards using mobile banking fully mediates the effect of performance expectancy (direct-effect = 0.033ns; indirect-effect = 0.088**) and environmental benefits (direct-effect = 0.026 ns; indirect-effect = 0.129**) on behavioural intention. Other findings revealed that attitudes towards using mobile banking partially mediated the relationships between social influence (direct-effect 0.144**; indirect-effect 0.054**), Personnel Innovativeness in IT (direct-effect 0.15**; indirect-effect 0.171**) and behavioural intention. Nevertheless, attitudes towards using mobile banking did not mediate the relationship between.

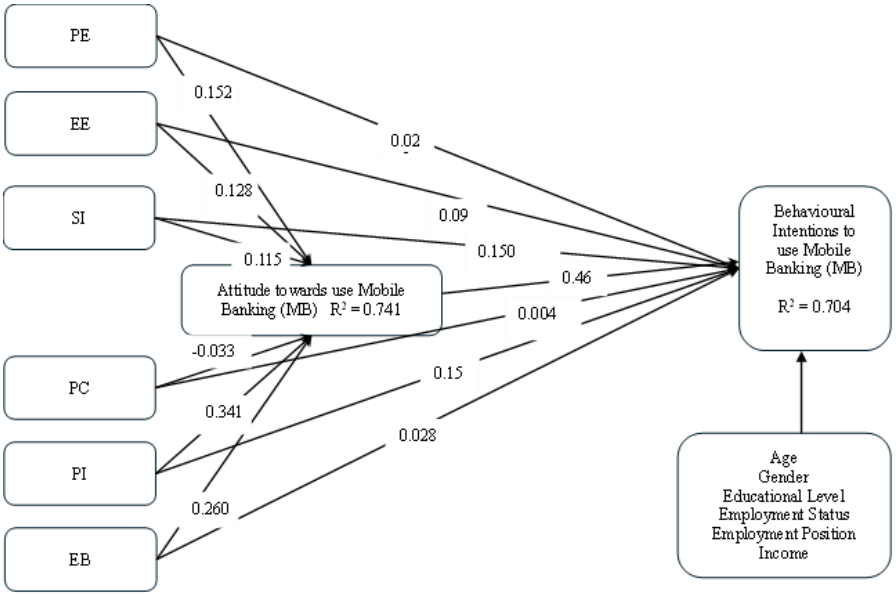


Figure 1. Conceptual framework of the study

Table 5 and figure 1 gives, Effort expectancy (direct-effect 0.109^{ns}; indirect-effect 0.073^{ns}), privacy concerns (direct-effect 0.002^{ns}; indirect-effect -0.014^{ns}) and behavioral intention. Besides, the study's proposed model demonstrates that 70.32% (R^2 = 0.7032) of the variance in behavioral intention can be accounted for. This suggests that the proposed model possesses sufficient explanatory capability in relation to behavioral intention.

DISCUSSION

The findings of this study provide valuable insights into the factors influencing the behavioral intention to adopt mobile applications in the context of banking services.

Contrary to expectations, performance expectancy, effort expectancy, environmental benefit, and privacy concern were identified as having no significant influence on the behavioral intention to adopt mobile applications. This may suggest that the perceived performance benefits associated with mobile applications were not effectively communicated or understood by participants, which aligns with findings from (Venkatesh et al., 2012 ; Gharaibeh, 2024), who noted that clear communication of benefits is crucial for user adoption.

First, it is possible that the perceived performance benefits expected from adopting mobile applications were not clearly communicated or understood by the participants, leading to an absence of a significant impact on their behavioral intentions. Similarly, if the effort required for adoption was not perceived as a significant barrier, or if participants did not anticipate substantial environmental benefits or privacy concerns associated with mobile application usage, these factors may not have played a crucial role in shaping their intentions.

However, the study revealed that social influence, personal innovativeness, and attitudes toward using mobile banking emerged as significant predictors of behavioral intention. Previous studies also explored that social influence, personal innovativeness and attitudes towards using mobile banking influence on behavioral intention to adopt mobile applications (Elhajjar & Ouaida, 2019; Giovanis et al., 2019; Thusi & Maduku, 2020).

Furthermore, if participants did not perceive the effort required for adoption as a significant barrier, or if they did not anticipate substantial environmental benefits or privacy concerns, these factors may have had little impact on shaping their intentions. This is consistent with research by Wang et al. (2019), which found that users often overlook these factors if they believe the technology aligns well with their needs.

Conversely, the study identified social influence, personal innovativeness, and attitudes toward using mobile banking as significant predictors of behavioral intention. This corroborates previous studies, such as those by Elhajjar & Ouaida (2019), Giovanis et al. (2019), and Thusi & Maduku (2020), which similarly highlighted the importance of these factors in shaping user adoption of mobile applications.

Particularly noteworthy is the mediating role of attitudes toward using mobile banking in the relationship between performance expectancy and behavioral intention to adopt mobile applications, as well as environmental benefits and behavioral intention. These results suggest that individuals' perceptions of mobile banking, their personal innovativeness, and the influence of social factors play crucial roles in shaping their behavioral intentions towards adopting mobile applications in the banking sector. The study underscores the need for financial institutions to consider these nuanced factors when designing strategies to promote the adoption of mobile applications among their clientele.

Performance Expectancy and Effort Expectancy: The lack of significant influence from performance expectancy may indicate that participants did not perceive substantial improvements in their banking efficiency through mobile applications. Previous research, such as that by Wang et al., 2019, supports this notion, suggesting that users often overlook performance benefits if they believe the technology aligns well with their needs or if the communication of these benefits is inadequate. Similarly, effort expectancy, which refers to the perceived ease of use, may not have been a deterrent if participants felt that the learning curve associated with mobile applications was manageable.

This is consistent with findings from Davis (1989), who emphasized that perceived ease of use significantly affects technology adoption, albeit this study's results suggest that it may not have been a primary concern for our respondents. Environmental Benefits and Privacy Concerns: The findings regarding environmental benefits and privacy concerns mirror the observations in the literature that suggest these factors may be less influential in the decision-making process for mobile banking adoption. For instance, Giovanis et al. (2019) found that while users are increasingly aware of environmental issues, this awareness does not always translate into action unless users perceive a direct benefit to themselves. Moreover, if participants did not view privacy risks as significant, this could explain the lack of impact on their behavioral intentions. As highlighted by Thusi & Maduku (2020), users often prioritize convenience and efficiency over privacy when adopting new technologies.

Significant Predictors of Behavioral Intention: In contrast, social influence, personal innovativeness, and attitudes toward using mobile banking emerged as significant predictors of behavioral intention. This finding is consistent with previous studies (Elhajjar & Ouaida, 2019; Giovanis et al., 2019; Thusi & Maduku, 2020), which underscore the importance of social factors and individual traits in technology adoption. Social influence reflects the degree to which individuals perceive that important others believe they should use a technology, which has been shown to significantly impact adoption decisions. The significance of personal innovativeness suggests that individuals who are more open to trying new technologies are more likely to adopt mobile banking applications.

Mediating Role of Attitudes: Particularly noteworthy is the mediating role of attitudes toward using mobile banking in the relationship between performance expectancy and behavioral intention, as well as between environmental benefits and behavioral intention. This mediating effect highlights the complex interplay between users' perceptions and their actual intentions. It indicates that individuals who hold a positive attitude towards mobile banking are more likely to be influenced by their perceptions of performance benefits and environmental impacts.

This finding is corroborated by prior research, suggesting that attitudes serve as a crucial intermediary that shapes how users interpret various factors influencing their adoption decisions. Implications for Financial Institutions: The study underscores the necessity for financial institutions to consider these nuanced factors when designing strategies to promote mobile application adoption. Institutions should focus on enhancing communication regarding the performance benefits of mobile applications and leverage social influence to foster positive attitudes. Strategies could include targeted marketing campaigns that highlight the advantages of mobile banking in real-world scenarios, engaging influencers or community leaders to advocate for mobile banking, and providing educational resources that demystify the technology and its benefits.

Theoretical Implications

The extension of the Unified Theory of Acceptance and Use of Technology (UTAUT) in this research signifies a fundamental acknowledgment that the original UTAUT framework might not comprehensively encompass all the pertinent factors influencing technology adoption, particularly in the nuanced context of mobile banking. This extension reflects a proactive effort to refine and broaden the theoretical underpinnings, recognizing that the landscape of technology acceptance is dynamic and context-dependent. By introducing variables such as privacy concern, environmental benefits, and personal innovativeness, the research endeavors to augment the predictive power of the UTAUT model.

This augmentation implies a more nuanced and encompassing understanding of the factors shaping user acceptance and utilization of mobile banking technologies. The inclusion of these additional variables is anticipated to refine the model's ability to explain and predict user behavior in the evolving realm of mobile banking. The incorporation of privacy concern and environmental benefits into the extended UTAUT framework emphasizes a commitment to achieving a holistic understanding of adoption factors (Al-Baltah et al., 2024). This recognition underscores the multifaceted nature of technology adoption, asserting that users' apprehensions about privacy and their cognizance of the environmental implications of technology can wield substantial influence over their decisions to embrace mobile banking (Al-Baltah et al., 2024). The emphasis on the emerging country context not only highlights the geographical diversity in technology adoption but also underscores the significance of cultural and contextual factors.

This emphasis suggests an understanding that the dynamics of mobile banking adoption can vary significantly across different regions and economic settings, necessitating a more nuanced and context-specific approach. The explicit mention of filling the research gap in mobile banking adoption in emerging countries signals a notable contribution to the academic literature. Beyond extending the UTAUT framework, the study addresses a critical void in empirical evidence and theoretical development within the specified context, enriching the scholarly discourse on technology adoption in regions experiencing rapid technological evolution (Çelik & Özköse, 2023).

Practical Implications

Mobile banking providers should tailor their marketing strategies to highlight the positive aspects of mobile banking, emphasizing attributes like convenience, speed, and efficiency. By focusing on enhancing users' perceptions of performance expectancy, these providers can positively influence individuals' behavioral intentions to adopt mobile applications. Creating compelling marketing campaigns that showcase the practical benefits and features of mobile banking can help attract and retain users. Emphasizing the seamless and time-saving nature of mobile transactions, for example, may address potential concerns and encourage wider adoption.

Recognizing the significance of personal innovativeness, mobile banking providers should consider implementing educational programs and user training sessions. These initiatives can serve to familiarize potential users with the innovative features and advantages of mobile banking applications. By reducing barriers to entry through education, providers can enhance users' comfort and confidence in utilizing mobile banking services. Offering user-friendly tutorials, webinars, or interactive guides can empower individuals to make informed decisions about adopting mobile banking, thereby contributing to increased usage and acceptance of these technologies.

Given the mediating role of environmental benefits in shaping attitudes and behavioral intentions, mobile banking providers should incorporate environmental messaging into their communication strategies (Ashraf & Varela-Neira, 2022). Highlighting the eco-friendly advantages of using mobile applications, such as promoting paperless transactions and reducing carbon footprints, can resonate with environmentally conscious users. Integrating sustainability into the marketing narrative can not only contribute to positive attitudes but also foster a sense of social responsibility among users, potentially influencing their behavioral intentions to adopt mobile banking services with a positive environmental impact.

Limitation and Future Research Direction

This study focuses on quantitative approach to explore the factors influencing mobile banking adoption. A qualitative exploration of consumers' perspectives on the perceived barriers to mobile banking adoption could also provide richer insights. In-depth interviews or focus group discussions may uncover hidden factors that quantitative surveys might not capture, contributing to a more comprehensive understanding of the challenges faced by consumers. This study provides valuable insights into the specific context of Sri Lanka. Thus, caution should be exercised when generalizing the findings to other regions or countries with different socio-economic and cultural backgrounds. Replication studies in diverse contexts would enhance the external validity of the research. The rapid evolution of mobile banking technology may render some findings obsolete over time. Longitudinal research design to align with technological advancements are necessary to ensure the relevance of the study's insights in a rapidly changing landscape. The study relies on self-reported data, which may introduce common method bias and social desirability bias. Future research could incorporate objective measures or combine self-reported data with behavioral observations to more accurately assess consumers' intentions and behaviors.

CONCLUSIONS

The findings of this study provide valuable insights into the factors influencing the behavioral intention to adopt mobile applications in the context of banking services. Contrary to expectations, performance expectancy, effort expectancy, environmental benefit, and privacy concern were identified as having no significant influence on the behavioral intention to adopt mobile applications. This suggests that the perceived performance benefits associated with mobile applications may not have been effectively communicated or understood by participants, aligning with findings from Venkatesh et al. (2022), who noted that clear communication of benefits is crucial for user adoption in digital platforms.

The lack of impact from effort expectancy, environmental benefits, and privacy concerns resonates with the findings of which indicated that when users feel comfortable with technology, perceived barriers diminish (Nguyen et al., 2024). Conversely, social influence, personal innovativeness, and attitudes toward using mobile banking emerged as significant predictors of behavioral intention. This is supported by Shin et al. (2022), who found that social factors and individual traits are crucial in technology adoption, reinforcing the results of previous studies by Elhajjar & Ouaida (2019) and Giovanis et al., (2019). The mediating role of attitudes towards using mobile banking in the relationship between performance expectancy and behavioral intention, as well as environmental benefits, highlights the complex dynamics at play. Research by Kumar et al., (2023) emphasizes the importance of user attitudes in shaping adoption behavior, further supporting the findings of this study. Practically, mobile banking providers are encouraged to tailor their strategies by highlighting the convenience and efficiency of mobile applications (Kumar et al., 2023).

Educational initiatives aimed at enhancing personal innovativeness can empower users and reduce barriers to adoption (Shin et al., 2022). Additionally, integrating environmental messaging into marketing campaigns may resonate with users who are increasingly aware of sustainability issues (Elhajjar & Ouaida, 2019). While this study offers valuable insights, it also acknowledges certain limitations, such as the reliance on a quantitative approach and the need for further exploration through qualitative methods. Future research should consider longitudinal designs to keep pace with technological

advancements and replicate the study across diverse contexts to enhance its external validity (Giovanis et al., 2019).In summary, this research contributes to the understanding of mobile banking adoption, providing both theoretical and practical implications that can inform future studies and strategies in the evolving landscape of digital finance.

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TOWARDS GREENER SKIES: EVALUATING SUSTAINABLE AVIATION FUEL ALTERNATIVES

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Abstract: The aviation sector is a major contributor to global carbon emissions, with increasing demands for air travel intensifying environmental concerns. Sustainable Aviation Fuels (SAFs) have emerged as a promising alternative to mitigate the carbon footprint of air travel while supporting the industry's sustainability goals. However, the adoption of SAFs is influenced by multiple factors, including environmental impact, economic feasibility, technical feasibility, and social acceptability. A systematic evaluation of these factors is essential to identify the most suitable SAF options for widespread implementation. This study aims to assess and prioritize sustainable aviation fuel alternatives using a structured multi-criteria decision-making framework. The evaluation focuses on identifying the SAFs that provide the most significant environmental benefits while ensuring economic and technical viability and gaining social acceptance. The study employs the Analytic Hierarchy Process (AHP) to prioritize four primary criteria - environmental impact, economic feasibility, technical feasibility, and social acceptability - and evaluate SAF alternatives. Data were collected from a diverse group of aviation experts, including pilots, air traffic controllers (ATCOs), engineers, managers, and researchers. Pairwise comparison matrices were constructed to capture expert opinions, and responses were aggregated based on job categories and experience levels for a comprehensive analysis. The results indicate that environmental impact is the most critical criterion, with carbon emissions being a key determinant. Among the evaluated SAF alternatives, Synthetic Paraffinic Kerosene (SPK) achieved the highest ranking due to its superior compatibility with existing aviation infrastructure and its significant environmental benefits. Hydrogenated Vegetable Oil (HVO) followed closely, praised for its operational feasibility within current airport systems. In contrast, Gas to Liquids (GTL) ranked lower, primarily due to concerns regarding its economic viability and the energy intensity of its production process. The study highlights the need to prioritize SAF alternatives that balance environmental performance with technical and economic feasibility. SPK and HVO stand out as the most viable options for reducing aviation-related carbon emissions and advancing sustainability goals. These findings provide valuable insights for policymakers and industry stakeholders, emphasizing the importance of investment in SAF infrastructure and supportive regulatory frameworks to drive adoption. Promoting SAFs will play a key role in reducing the aviation sector's environmental impact and supporting sustainable tourism practices globally.

Keywords: sustainable aviation fuel, analytical hierarchy process, environmental impact, economic feasibility, sustainability

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INTRODUCTION

The aviation sector significantly contributes to greenhouse gas emissions, particularly carbon dioxide (Cabrera and de Sousa 2022). With its ongoing expansion, mitigating aviation's environmental impact remains a critical challenge. A promising approach is the advancement of sustainable aviation fuel (SAF) (Bergero et al., 2023), which can lower aviation's carbon footprint while addressing the growing demand for fuel. However, SAF development is influenced by economic, technical, and social factors. This study on sustainable aviation fuels (SAFs) directly supports sustainable tourism (Fanni & Rezazadeh, 2018; Sutiksno et al., 2024) by addressing a key environmental challenge in air travel: carbon emissions (Qasem et al., 2024). Tourism heavily relies on air transportation, contributing significantly to its carbon footprint. In tourism, sustainability, green, and environmental aspects are playing an increasingly important role for both

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tourists and service providers, a focus highlighted in several studies (Kyriakaki & Kleinaki, 2021; Refaat & Arafa, 2022; Al Dein, Fahmawee & Jawabreh, 2023; Esparza-Huamanchumo et al., 2024, Atshan et al., 2024). According to 2023 statistics, tourism travel accounted for approximately 50-60% (IATA, 2023; Tourism Organization, 2024) global air traffic, primarily involving short- and medium-haul flights, contributes significantly to carbon emissions. These routes often limit the potential for efficient fuel use and the application of alternative fuels.

This substantial share is significant because global air transport's carbon dioxide emissions heavily impact the environment; estimates by the International Civil Aviation Organization (ICAO) indicate that aviation accounts for 2-3% of total human-caused emissions. Reducing tourism-related flights and adopting more sustainable fuels are therefore crucial for tourism's sustainability. The sustainable aviation fuels (SAFs) examined in the study, such as Synthetic Paraffinic Kerosene (SPK) and Hydrogenated Vegetable Oil (HVO), are especially important for tourism sustainability as they offer options to mitigate the environmental impact of air travel. In doing so, they contribute to the sustainability goals of the tourism industry by reducing its carbon footprint and making eco-conscious travel options more attractive.

A primary barrier is the higher production cost compared to conventional fossil fuels, driven by factors such as feedstock availability, conversion technology, and economies of scale (Tanzil et al., 2021; Monte et al., 2022). SAF production costs are influenced by agricultural production, land-use policies, weather conditions, and global market dynamics, which affect both the availability and price of feedstocks (O'malley, Pavlenko & Searle, 2021; Mofijur et al., 2023). Certain feedstocks, such as food crops, also raise concerns regarding competition with food security, land conservation, and sustainability. Although SAF prices are expected to decrease as technology advances and production volumes increase, the economic challenge remains significant. Technical feasibility is equally crucial in SAF adoption. SAF must be compatible with existing aviation infrastructure, including aircraft, engines, and fuel systems, and it must meet rigorous fuel specifications such as energy density and combustion characteristics (Hileman & Stratton, 2014; Shahriar & Khanal, 2022). Additionally, the supply chain for SAF, which encompasses production, distribution, and storage, requires significant infrastructure development to ensure scalability and effective deployment.

Social acceptability (Kantenbacher et al., 2018) presents another layer of complexity. Public perception and acceptance of SAF play a vital role in its success. While SAF reduces aviation's carbon footprint, concerns exist over its impacts on water, biodiversity, and land use (Anderson et al., 2022; Chong, Chemmangattuvalappil & Thangalazhy-Gopakumar, 2023). Several promising solutions address the development challenges of SAF (Schmidt et al., 2018). Synthetic paraffinic kerosene (SPK), hydrogenated vegetable oil (HVO), and gas-to-liquids (GTL) are key examples of alternative fuels that can potentially reduce aviation's carbon footprint while remaining economically feasible and technically viable (Ram & Salkuti, 2023). SPK, produced via Fischer-Tropsch synthesis from feedstocks like waste oils, natural gas, and coal, offers compatibility with existing infrastructure. Similarly, HVO is a renewable diesel derived from vegetable oils, and GTL involves converting natural gas into liquid hydrocarbons, including jet fuel (Shahabuddin et al., 2020).

However, SAF development faces economic, technical, and social challenges (Martinez-Valencia, Garcia-Perez & Wolcott, 2021). High production costs, feedstock availability, and public acceptance are significant barriers. Addressing these requires a multi-stakeholder approach, involving collaboration between industry, policymakers, and the public (Ahmad et al., 2019). Moreover, the use of alternative feedstocks, such as waste materials or non-food crops, can mitigate concerns regarding land use and food production competition. Novel conversion technologies, such as Fischer-Tropsch synthesis and pyrolysis, offer the potential for greater efficiency and cost reduction (Montoya Sánchez et al., 2022).

Sustainable aviation fuels (SAFs), such as Synthetic Paraffinic Kerosene (SPK), Hydrogenated Vegetable Oil (HVO), and Gas-to-Liquids (GTL), play a vital role in reducing aviation's carbon footprint, thus supporting tourism's sustainability goals by offering eco-conscious travel options (Kuqi, 2018; Detsios et al., 2023). SPK, produced from various feedstocks, and HVO, obtained through hydrogenating vegetable oils or animal fats, meets severe aviation standards and closely resembles conventional jet fuel properties. GTL, produced by converting natural gas into liquid hydrocarbons, further expands sustainable aviation fuel sources. Ongoing SAF innovation and regulatory support remain essential to the industry's decarbonization and broader adoption (Ram & Salkuti, 2023). The purpose of this study is to evaluate the preferences of different job categories and experience levels toward Sustainable Aviation Fuel (SAF) using the Analytic Hierarchy Process (AHP). The study involves two aggregated steps. The first step is an AHP evaluation of SAF based on job categories, which include pilots, air traffic control officers (ATCOs), aircraft engineers, aviation managers, and researchers. A generalized hierarchical model is constructed using the primary criteria of the current system, allowing for multiple levels of decision-making to develop evaluator preference loads for the assessment and weighting process (Alharasees et al., 2024 a, 2024 b,), resolve conflicts and uncertainties, and address missing information using other AHP functions.

The "Saaty Scale" is utilized to score missing data, generating matrices using a specific method. The second step involves an AHP evaluation of SAF based on experience level, which includes less experienced and experienced individuals within each job category. The same process is followed in constructing a generalized hierarchical model and resolving conflicts and uncertainties. This step helps to identify the preferences of less experienced and experienced individuals towards SAF within each job category. Overall, the aim of this study is to evaluate the preferences of different job categories and experience levels toward Sustainable Aviation Fuel (SAF) using the Analytic Hierarchy Process (AHP). By examining the perspectives of pilots, air traffic control officers (ATCOs), aircraft engineers, aviation managers, and researchers, as well as differentiating between less experienced and experienced individuals, the study seeks to uncover nuanced preferences that influence SAF adoption. Through this multi-criteria evaluation, the research aims to provide actionable insights that can support industry stakeholders, policymakers, and aviation professionals in shaping informed decisions, developing targeted strategies, and advancing SAF implementation to achieve environmental sustainability in aviation.

METHOD

The analytical Hierarchy Process (AHP) was developed by Saaty in the 1980s to enhance systematic evaluation and decision-making (Saaty, 1990). This methodology combines mathematical rigor with psychological insights (Alharasees & Kale, 2024). as detailed in his works from 1990 and 1994 (Saaty, 1994). AHP utilizes objective mathematical techniques to aid individuals or groups in reassessing their priorities during decision-making (Alharasees & Kale, 2023). By implementing AHP, users can effectively analyze intricate decision problems, leading to informed and sound conclusions. The AHP technique serves to evaluate and prioritize various options by establishing a decision hierarchy (Alharasees et al., 2022). This process involves assigning relative importance percentages to each alternative, thereby facilitating clear preference rankings. This structured approach is particularly useful for complex decision-making scenarios requiring a systematic hierarchy of options (Alharasees & Kale, 2022).

At the core of AHP is the subjective evaluation of alternatives based on established criteria. A significant element is the Saaty scale, which quantifies the influence of different factors on decision-making and assesses the relative significance of each option within the model. Figure 1 illustrates a flowchart of the AHP decision-making process, which includes identifying relevant criteria, evaluating and ranking options by their importance, converting subjective assessments into quantifiable percentages, and ultimately utilizing this information to reach a final decision.

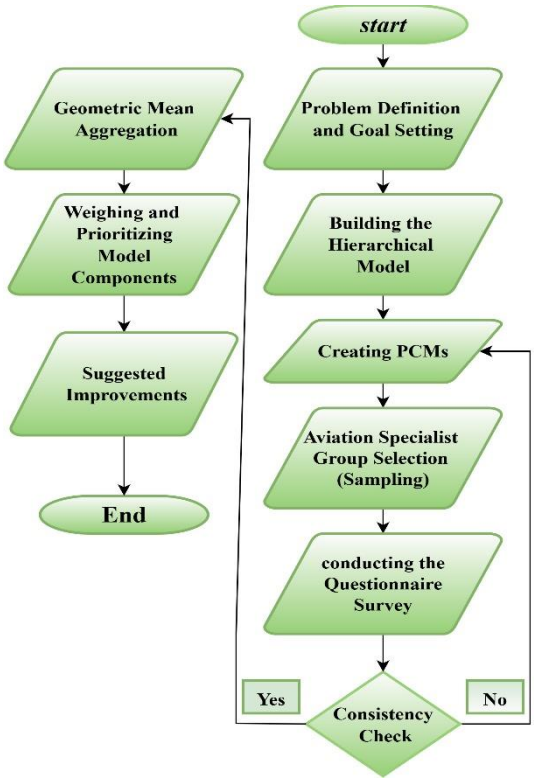


Figure 1. AHP method flowchart

The AHP method flowchart shown in Figure 1 can be used to evaluate the critical factors of sustainable aviation fuel (SAF) and suggest alternative solutions. The steps involved in using the AHP method for this purpose are outlined as follows:

1. The first step is to define the problem and determine the goal of the study, which is to evaluate the critical factors of sustainable aviation fuel and suggest alternative solutions.
2. The second step involves building a hierarchical model that contains the relevant features and characteristics of sustainable aviation fuel. The model consists of a hierarchy of decision elements that are arranged in a tree-like structure with the goal at the top, the criteria and sub-criteria in the middle, and the alternatives at the bottom.
3. The third step is to create pairwise comparison matrices (PCM) based on the hierarchy. These matrices represent the decision-maker's preferences between specific pairs of options and are created using a scale such as the Saaty scale. The elements of the matrix are positive, transitive, and reciprocal, indicating consistency.
4. The fourth step involves selecting aviation specialists or experts through sampling. The selected group should have a clear understanding of the decision-making criteria and be able to provide valuable feedback on the critical factors of sustainable aviation fuel.
5. The fifth step involves conducting a questionnaire survey to collect opinions and preferences from the aviation specialist groups. The survey should be carefully designed to ensure that the questions are clear and easy to understand.
6. In the sixth step, the consistency ratio (CR) of the PCM should be checked. If the CR of the PCM is less than 0.1, the process can continue. However, if the CR is greater than 0.1, adjustments should be made, such as reviewing the judgments made in the PCMs and considering the reasons behind any inconsistencies or gathering more data by conducting additional surveys or seeking expert opinions to improve the consistency of the PCMs.

7. In the seventh step, the PCM for each individual participant in each group is aggregated using the geometric mean aggregation method to obtain a single PCM that represents the preferences of the group. A single consensus matrix that reflects the overall opinions of the group is allowed by this method for the aggregation of multiple participants' preferences.

8. The eighth step involves weighing and prioritizing the model components. The weights are determined using the eigenvector method, and the prioritization is done using the weighted sum method to determine the critical factors of sustainable aviation fuel.

9. The final step involves suggesting alternative solutions to improve the current situation based on the results of the AHP analysis. The results of the AHP analysis can be used to identify the strengths and weaknesses of the current system and suggest possible improvements to make sustainable aviation fuel more efficient and sustainable.

The creation of pairwise comparison matrices (PCM) is a fundamental component of the AHP method. These matrices serve as a representation of the decision-makers degree of preference between a given pair of options (Ai versus Aj, for all i, j = 1, 2,…, n), as described by the matrix A = [aij] displayed in equation 1. Typically, these matrices are constructed using a scale such as the Saaty scale (Table 1). A consistent matrix is one in which the matrix elements are positive, transitive, and reciprocal (Saaty, 1977).

$$A = [a_{ij}] = \begin{bmatrix} 1 & a_{12} & . & . & a_{1j} & . & . & a_{1n} \\ \frac{1}{a_{12}} & 1 & . & . & a_{2j} & . & . & a_{2n} \\ . & & . & & & & & . \\ . & & & . & & & & . \\ \frac{1}{a_{1j}} & \frac{1}{a_{2j}} & . & . & a_{ij} & . & . & a_{in} \\ . & . & & & & . & & . \\ . & . & & & & & . & . \\ \frac{1}{a_{1n}} & \frac{1}{a_{2n}} & . & . & \frac{1}{a_{in}} & . & . & 1 \end{bmatrix} \quad (1)$$

Table 1. Saaty scale (Saaty, 1977)

Numerical values	Description
1	Equal importance of both aspects
3	Moderate importance of one aspect over another
5	Strong importance of one element over another
7	Very strong importance of one aspect over another
9	Extreme importance of one aspect over another
2,4,6,8	Intermediate values

Figure 2 displays the hierarchical model that has been created for Sustainable Aviation Fuel (SAF), along with its corresponding components at each level. The suggested alternative solutions are also included in the final level of the model.

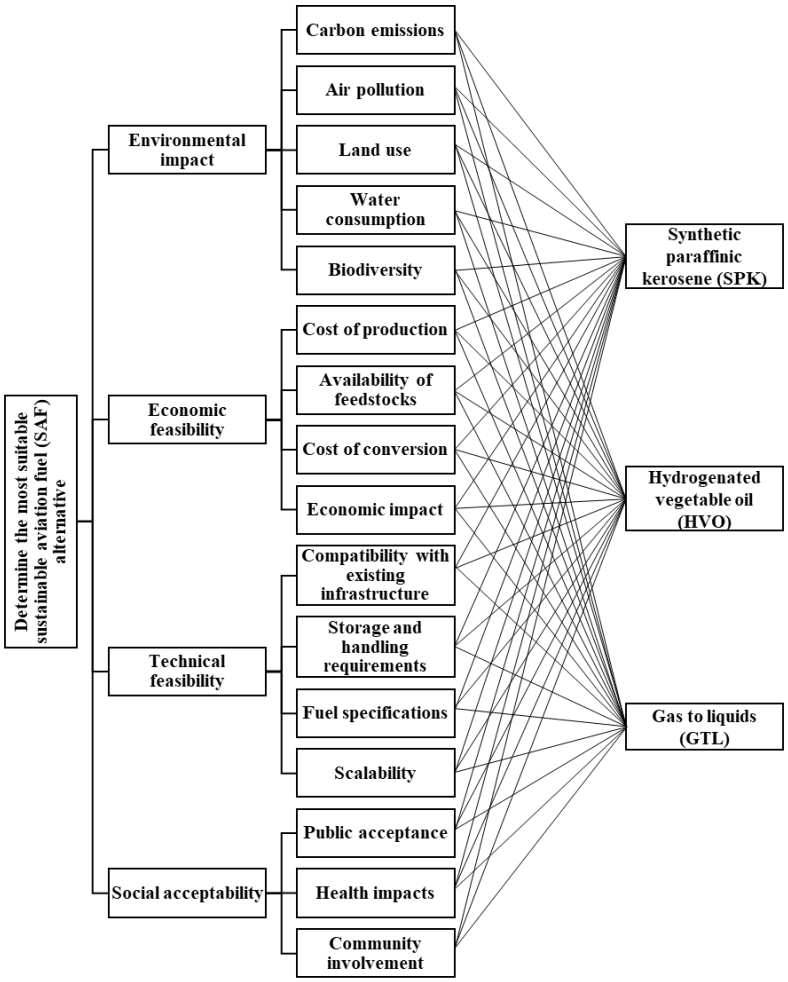


Figure 2. The SAF Hierarchy (Alharasees & Kale, 2025)

The goal of this research is to determine the most suitable sustainable aviation fuel (SAF) alternative based on a set of comprehensive criteria. The criteria are organized in a hierarchical structure as illustrated in Table 2 consisting of four main levels, each with sub-criteria:

1. Environmental Impact: This level assesses the potential environmental impact of each SAF alternative. The sub-criteria include carbon emissions, air pollution, land use, water consumption, and biodiversity. Carbon emissions are a major contributor to climate change and air pollution (Mohd Shariff et al., 2019), which can have negative impacts on human health and the environment. Land use can be a significant concern as the demand for biofuels increases, leading to deforestation and other land-use changes. Water consumption is also an important consideration, as the production of biofuels can be water-intensive. Biodiversity loss is another critical factor to consider, as land-use changes can impact habitats and ecosystems.

2. Economic Feasibility: This level evaluates the economic viability of each SAF alternative. The sub-criteria include the cost of production, availability of feedstocks, cost of conversion, and economic impact. The cost of production is a critical factor that affects the overall economic feasibility of the SAF alternative. The availability of feedstocks is also a significant consideration as it can impact the scalability of production. The cost of conversion is another important factor, as it can significantly impact the final price of the SAF. Finally, the economic impact of the SAF alternative on the market is a key consideration, as it can impact the adoption rate of the alternative fuel.

3. Technical Feasibility: This level assesses the technical feasibility of each SAF alternative. The sub-criteria include compatibility with existing infrastructure, storage and handling requirements, fuel specifications, and scalability. Compatibility with existing infrastructure is an essential consideration as it can impact the implementation of the SAF alternative. Storage and handling requirements are also crucial factors to consider, as they can impact the logistics and safety of the fuel. Fuel specifications are another important factor, as they impact the performance of the fuel in aircraft engines. Scalability is also a critical consideration as it determines the potential for large-scale production and adoption of the SAF alternative.

4. Social Acceptability: This level evaluates the social acceptability of each SAF alternative. The sub-criteria include public acceptance, health impacts, and community involvement. Public acceptance is a significant consideration, as it can impact the adoption rate of the SAF alternative. Health impacts are another important factor to consider, as they can impact the well-being of communities near SAF production facilities or airports. Finally, community involvement is also an essential consideration, as it can impact the perception and adoption of the SAF alternative in local communities.

Alternatives

In the context of the aviation industry's increasing efforts towards sustainability, the development and use of sustainable aviation fuel (SAF) have become a vital focus area for reducing carbon emissions and environmental impact. To achieve this goal, evaluating and selecting the most suitable SAF alternative based on various criteria and sub-criteria is necessary. In this regard, the following alternatives have been suggested:

Alternative 1: Synthetic Paraffinic Kerosene (SPK) Synthetic paraffinic kerosene (SPK) is a fuel produced from biomass and fossil fuels through the Fischer-Tropsch process. SPK is a promising alternative for sustainable aviation fuel due to its high energy density, low emissions, and compatibility with existing aircraft engines. The production of SPK requires the gasification of biomass or gas and coal, followed by the synthesis of hydrocarbons, refining, and blending with petroleum-based jet fuel. The production process of SPK is complex, and its cost is high compared to petroleum-based jet fuel. However, SPK has shown the potential to reduce carbon emissions and air pollution, making it a suitable candidate for evaluation in the hierarchical approach.

Alternative 2: Hydrogenated Vegetable Oil (HVO) Hydrogenated vegetable oil (HVO) is a renewable aviation fuel produced from vegetable oils through hydrogenation. The process involves heating vegetable oils with hydrogen to produce hydrocarbons that can be blended with petroleum-based jet fuel. HVO has a high energy density and a low carbon intensity, which makes it a promising alternative for sustainable aviation fuel. The production of HVO requires the availability of sufficient quantities of vegetable oils and hydrogen, and the refining process requires high-pressure hydrogenation. However, HVO has been shown to have good compatibility with existing aircraft engines, making it a suitable candidate for evaluation in the hierarchical approach.

Alternative 3: Gas to Liquids (GTL) Gas to liquids (GTL) is a process that converts natural gas into liquid hydrocarbons such as jet fuel through the Fischer-Tropsch process. GTL has a low carbon intensity and produces fewer pollutants compared to petroleum-based jet fuel. The production process of GTL involves converting natural gas into syngas through gasification and then synthesizing the syngas into hydrocarbons, refining, and blending with petroleum-based jet fuel. The production process of GTL is complex, and its cost is high compared to petroleum-based jet fuel. However, GTL has shown the potential to reduce carbon emissions and air pollution, making it a suitable candidate for evaluation in the hierarchical approach.

In conclusion, the SAF hierarchal approach provides a comprehensive and structured framework for evaluating the most suitable SAF alternative. The four levels of criteria and sub-criteria provide a detailed assessment of each alternative's environmental impact, economic feasibility, technical feasibility, and social acceptability. The suggested alternatives offer a range of options that can be further evaluated using the pairwise comparison matrices to select the most suitable SAF alternative. The next step will involve creating the PCMs based on the hierarchical model to assess and weigh all the model parameters, comprehensively evaluate the model aspects at each level, and consider all the model aspects together to eventually define the critical aspects of the constructed model.

Questionnaire: In the present study, an online survey was conducted utilizing the Analytic Hierarchy Process (AHP) methodology, involving 17 aviation specialists hailing from 12 different countries. Figure 3 visually depicts the distribution of the participating countries.

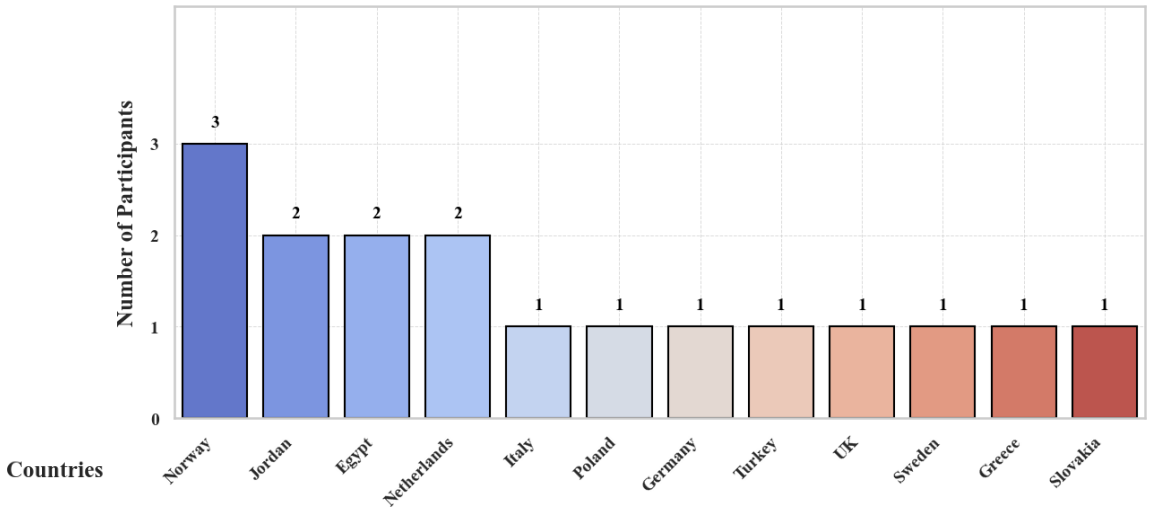


Figure 3. The distribution of the participating countries

The survey focused on evaluating the critical elements involved in the evaluation of sustainable aviation fuel (SAF) and aimed to identify the most significant challenges perceived by experts in the field. The survey utilized the job category, knowledge, and experience of the experts to consider a variety of perspectives and highlight different viewpoints of stakeholders in the aviation industry. The main objective of the survey was to quantify the challenges involved in the evaluation of SAF from the standpoint of the experts and to suggest some solutions for sustainable aviation in the future.

To ensure the accuracy of the investigation, the study was divided into two aggregated steps in the evaluation process. The first step involved categorizing the participants into five groups based on their job sector, which included pilots, air traffic controllers (ATCOs), aviation engineers, aviation managers, and aviation researchers and analysts. The demographic data for the participants are presented in Table 2. In the second step, the participants were regrouped based on their experience levels into two main groups: less experienced and experienced, as shown in Table 2 presents descriptive statistics for various demographic variables of employees in the air transportation industry, including the number of participants (N), mean age, and standard deviation of age provided for each group.

Table 2. **T**he participants' details

Variables		Total	Pilots	ATCOs	Engineers	Managers	Researchers	Experienced	Less experienced
N		17	4	3	3	3	4	4	3
Age	Mean	31	28	29	26	41	33	36	28
	SD	6	3	3	4	3	7	6	4
Gender %	Male	76%	75%	67%	100%	100%	50%	71%	80%
	Female	24%	25%	33%	0%	0%	50%	29%	20%

The age range and gender distribution of the participants are shown in Figure 4.

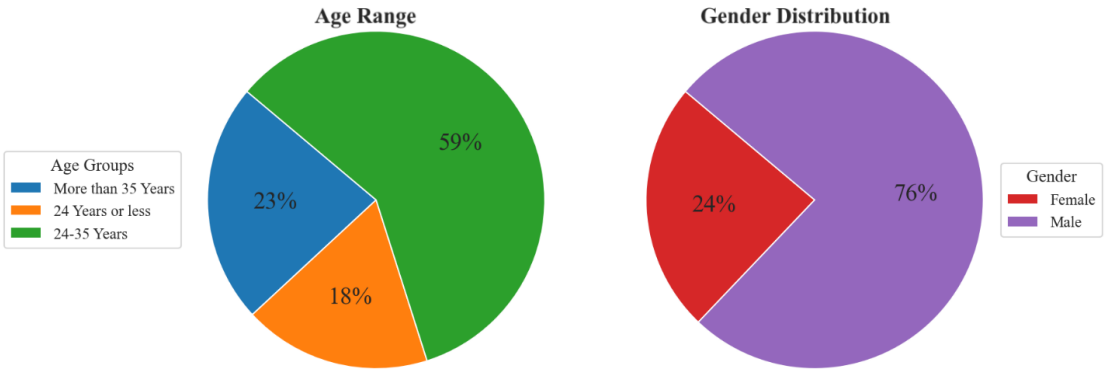


Figure 4. Age range (left) and gender distribution (right) of the participants

Pairwise comparison matrices were used to compute the matrix consistency ratio (CR) for each group, where the inconsistency in most of the experience matrices should be less than 0.1. The geometric mean for each group was then calculated to determine the relative significance of the model attributes at each level of the hierarchy.

This resulted in a single PCM for each group at each level of the hierarchy, representing the group's preferences for the associated model features. The normalization term was employed to determine the weight of each connecting element, and the final score was calculated using the aggregated eigenvector, ensuring the sum of the weights of the connected elements is 1.

RESULTS AND DISCUSSION

Upon scrutinizing the opinions of the respondents regarding the hierarchical approach of SAF evaluation, it is evident that there exist some divergences in the viewpoints of the expert groups owing to their distinct levels of expertise, occupational classifications, and comprehension of the present situation and its progression. Nevertheless, employing the Analytic Hierarchy Process (AHP) for comparing the perspectives in a pairwise manner renders a more exhaustive perspective of the sustainable aviation fuel conditions' development in the contemporary system compared to the straightforward, simplified techniques. Employing the designated methodology, the initial stage of grouping was conducted based on the job classifications, and the geometric mean was used to compute the averaged responses from each group. The weights and consistency ratios of the first level in the SAF model were calculated by each group and presented in Tables 3, 4, 5, 6, and 7.

Table 3. Pilots PCMs for the first level

PILOTs					
Criteria	Environmental impact	Economic feasibility	Technical feasibility	Social acceptability	Weights
Environmental impact	1.00	3.94	1.86	1.32	41.38%
Economic feasibility	0.25	1.00	0.64	1.11	15.09%
Technical feasibility	0.54	1.57	1.00	1.57	24.23%
Social acceptability	0.76	0.90	0.64	1.00	19.30%
CR=0.0507	Sum=				100%

Table 4. ATCOs PCMs for the first level

ATCOs					
Criteria	Environmental impact	Economic feasibility	Technical feasibility	Social acceptability	Weights
Environmental impact	1.00	4.31	1.59	2.29	46.23%
Economic feasibility	0.23	1.00	1.26	1.44	18.38%
Technical feasibility	0.63	0.79	1.00	1.26	19.97%
Social acceptability	0.44	0.69	0.79	1.00	15.42%
CR=0.0596	Sum=				100%

The first two presented tables show the weights and consistency ratios of the four criteria of the sustainable aviation fuel (SAF) model, calculated by two groups: pilots and air traffic controllers (ATCOs). the outcomes suggest that both groups share a similar view on the importance of environmental impact and technical feasibility in the development of SAF. However, the results also illustrate slightly different percentages in priorities. Pilots prioritize environmental impact and technical feasibility over economic feasibility and social acceptability, while air traffic controllers value environmental impact the most but also consider technical and economic feasibility. These differences may be related to their roles and responsibilities in the aviation industry. Pilots have a more direct impact on the environmental impact and technical feasibility of SAF, while air traffic controllers are concerned about air pollution and its effects on air traffic management.

Table 5. Aircraft engineers PCMs for the first level

ENGINEERs					
Criteria	Environmental impact	Economic feasibility	Technical feasibility	Social acceptability	Weights
Environmental impact	1.00	3.63	2.71	2.47	48.95%
Economic feasibility	0.28	1.00	2.29	1.82	22.43%
Technical feasibility	0.37	0.44	1.00	0.55	11.73%
Social acceptability	0.41	0.55	1.82	1.00	16.90%
CR=0.061	Sum=				100%

The third group of experts' outcomes in Table 6 shows that the highest weight was given to environmental impact, followed by economic feasibility, technical feasibility, and social acceptability. This indicates that engineers prioritize the environmental impact of SAF, while also considering its economic and technical feasibility, but place less emphasis on its social acceptability. The emphasis on environmental impact may be due to the engineers' technical knowledge of the effects of fuel emissions on the environment and the associated negative consequences. The lower weight given to social acceptability may indicate that engineers prioritize technical and economic feasibility over social concerns, potentially due to the perception that these are more tangible factors that can be directly addressed and solved through engineering solutions.

Table 6. Aviation managers PCMs for the first level

Management					
Criteria	Environmental impact	Economic feasibility	Technical feasibility	Social acceptability	Weights
Environmental impact	1.00	2.00	2.00	1.26	35.96%
Economic feasibility	0.50	1.00	2.15	1.00	24.65%
Technical feasibility	0.50	0.46	1.00	0.87	16.13%
Social acceptability	0.79	1.00	1.14	1.00	23.25%
CR=0.03026	Sum=				100%

Table 6 shows the criteria and weights assigned by management towards the use of SAF in the aviation industry. Environmental impact is given the highest weight, followed by economic feasibility, social acceptability, and technical

feasibility. This suggests that management highly values the potential environmental benefits of using SAF, but also considers its economic feasibility and social acceptability. The relatively lower weight given to technical feasibility may indicate that management assumes the technical challenges of using SAF can be overcome with sufficient resources and research. The high weight given to social acceptability suggests that management is aware of the potential public perceptions and reactions to the use of SAF. Overall, the weights assigned by management may reflect a desire to balance environmental concerns with economic and social considerations in the decision-making process.

The Researchers group in Table 7 prioritized environmental impact as the most crucial criterion, followed by economic and technical feasibility, with social acceptability as the least important but still significant. These weightings reveal the cause-effect relationships between SAF production and the aviation system. The emphasis on environmental impact acknowledges the need to reduce harmful aviation effects, while economic and technical feasibility reflects practical limitations. Public acceptance of SAF is also considered essential for successful adoption.

Table 7. Aviation researchers PCMs for the first level

Researchers					
Criteria	Environmental impact	Economic feasibility	Technical feasibility	Social acceptability	Weights
Environmental impact	1.00	1.78	2.45	2.34	39.90%
Economic feasibility	0.56	1.00	3.03	1.28	28.58%
Technical feasibility	0.41	0.33	1.00	1.57	15.87%
Social acceptability	0.43	0.78	0.64	1.00	15.65%
CR=0.0607	Sum=				100%

Aggregating the viewpoints of the five groups of participants allows for the identification of their divergences, which could stem from dissimilar work positions and levels of proficiency. The comparison of distinct groups of participants' perspectives can enable the comprehensive assessment and appraisal of different facets of the suggested SAF hierarchical model from diverse standpoints as shown in Figure 5.

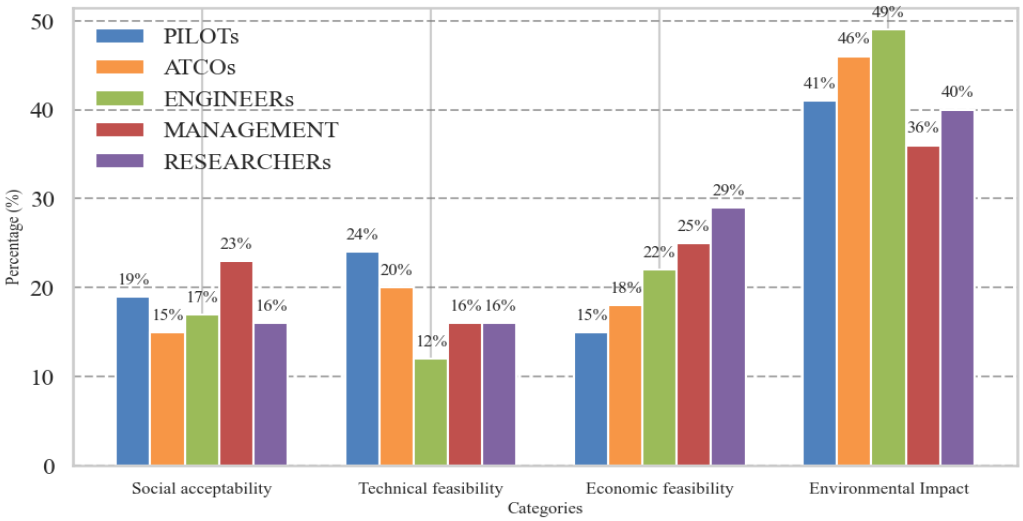


Figure 5. SAF criteria comparison - job classification based

In the second stage of aggregated evaluation, participants were regrouped into two categories based on their experience levels: a less experienced group with up to 5 years of experience (or up to 500 flight hours for pilots), and an experienced group with more than 5 years of experience (or more than 500 flight hours for pilots). The geometric mean was utilized to determine the average responses of each group. The weights and consistency ratios of the first level in the SAF model were then computed by each group and are presented in Tables 8 and 9. Table 8 shows the weight of different criteria in evaluating sustainable aviation fuels (SAF) from the perspective of less experienced aviation specialists. The environmental impact is rated as the most important criterion, followed by economic feasibility, technical feasibility, and social acceptability. The emphasis on environmental impact acknowledges the need to reduce greenhouse gas emissions and other harmful environmental effects of aviation. The weights assigned by the less experienced aviation specialists reflect a balanced and comprehensive approach to the development of sustainable aviation fuels.

Table 8. Less experienced aviation specialists PCMs for the first level

LESS EXPERIENCED					
Criteria	Environmental impact	Economic feasibility	Technical feasibility	Social acceptability	Weights
Environmental impact	1.00	1.47	1.28	1.52	31.63%
Economic feasibility	0.68	1.00	2.06	1.64	30.13%
Technical feasibility	0.78	0.49	1.00	1.45	20.89%
Social acceptability	0.66	0.61	0.69	1.00	17.36%
CR=0.0311	Sum=				100%

Table 9. Experienced aviation specialists PCMs for the first level

WELL EXPERIENCED					
Criteria	Environmental impact	Economic feasibility	Technical feasibility	Social acceptability	Weights
Environmental impact	1.00	0.77	1.49	1.51	28.68%
Economic feasibility	1.29	1.00	0.72	1.06	24.90%
Technical feasibility	0.67	1.39	1.00	1.51	26.93%
Social acceptability	0.66	0.94	0.66	1.00	19.49%
CR=0.0347	Sum=				100%

Table 9 shows that environmental impact and technical feasibility are the most critical factors for experienced aviation specialists when making decisions related to sustainable aviation fuel practices, while economic feasibility and social acceptability are of lesser importance. This finding highlights the need for the aviation industry to prioritize sustainability in its current practices and future developments. One futuristic vision toward sustainability in aviation is the adoption of Sustainable Aviation Fuels (SAF), which are considered a more sustainable alternative to traditional fossil fuels. The industry's goal is to reach carbon neutrality by 2050 (Abrantes et al., 2021), and the adoption of SAF is seen as a critical step in achieving this goal. To ensure a clear presentation of survey results and identification of critical elements in the current model from all expert perspectives, a thorough comparison of the model, including all aspects, is essential. Figure 6 comprehensively compares all aviation groups based on participant experience levels, while Figure 5 compares different participant groups based on job categories. Analyzing both figures facilitates the comparison of various criteria across different perspectives and emphasizes the most important criteria. The environmental impact criterion was found to be the most vital factor in both stages, followed by economic feasibility with some degree of variation across different groups. The focus is on identifying critical factors and their impact on the dynamic and stochastic aviation system.

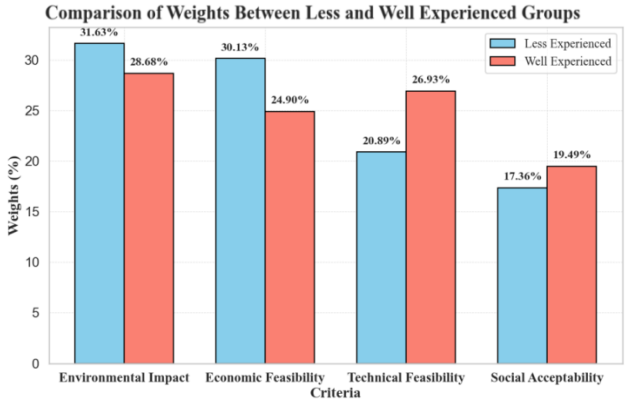


Figure 6. SAF-AHP criteria comparison experience based

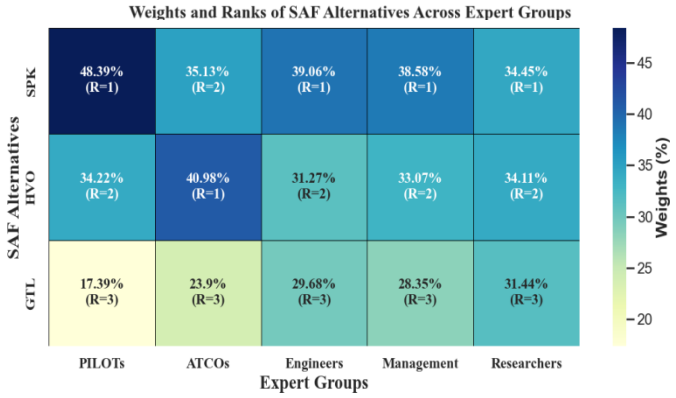


Figure 7. SAF Alternatives Heatmap

The evaluation of aviation practices based on varying levels of experience and job categories highlights the importance of prioritizing environmental impact and technical feasibility. Experienced aviation specialists tend to prioritize environmental impact and technical feasibility in their decision-making process due to their awareness of the negative impacts of sustainable aviation fuel approaches and practices on the environment and the technical aspects of aviation. Economic feasibility and social acceptability are less important to experienced aviation specialists as they can sometimes conflict with environmental and technical considerations. However, economic feasibility still holds a degree of importance as it is a vital factor in ensuring the sustainability of aviation fuel approaches and practices.The comparison of different groups based on job category and experience level provides a comprehensive understanding of the crucial elements of the current aviation system. The environmental impact criterion is the most important criterion across all groups, followed by economic feasibility. This suggests that sustainability and cost-effectiveness are crucial factors in decision-making related to sustainable aviation fuel approaches and practices. The importance of technical feasibility highlights the necessity of ensuring the safety and efficient operation of sustainable aviation fuel approaches and practices. The findings of the evaluation provide valuable insights for improving the current aviation system and moving towards a more sustainable and environmentally friendly future. Going for the Alternatives solution comparisons between the three alternatives as seen in Figure 7.

The evaluation of Sustainable Aviation Fuel (SAF) alternatives—Synthetic Paraffinic Kerosene (SPK), Hydrogenated Vegetable Oil (HVO), and Gas to Liquids (GTL)—demonstrates significant variances in preferences among aviation expert groups, driven by technological advancements and operational considerations. For instance, PILOTs assign SPK a weight of 48.39% and rank it highest (R=1), reflecting its superior performance characteristics and alignment with current engine technologies, which enhance operational efficiency and reduce emissions. In contrast, ATCOs favor HVO, giving it a weight of 40.98% and a first-place ranking (R=1), indicating a recognition of its compatibility with existing airport infrastructure and regulatory frameworks, which are crucial for seamless integration into current systems.

Engineers, Management, and Researchers show a consistent trend, ranking SPK highest and HVO second, which suggests a collective endorsement of SPK's technological merits in enhancing fuel efficiency and sustainability. The lower weights assigned to GTL across all groups, coupled with its third-place ranking, indicate a growing skepticism regarding its

environmental impact and economic viability, particularly in light of advancements in cleaner fuel technologies. This structured assessment highlights the importance of aligning SAF alternatives with both technological progress and the operational realities of the aviation sector, underscoring the need for ongoing research and development to support the transition towards more sustainable aviation practices. While the study provides valuable insights into the preferences for Sustainable Aviation Fuel (SAF) across job categories and experience levels, certain limitations must be considered.

First, the sample size (17 participants) is relatively small and may not fully capture the diverse perspectives of all aviation professionals globally. A larger sample could enhance the generalizability and reliability of the findings. Additionally, the study relies on expert opinions, which, while insightful, may introduce subjective biases based on individual roles and exposure to SAF technologies. The observed differences between groups, such as pilots prioritizing technical feasibility and ATCOs focusing on infrastructure compatibility, highlight role-specific preferences.

However, these differences also underscore the need for a more integrated approach to SAF adoption that balances environmental, economic, and technical concerns. For instance, the environmental impact was consistently prioritized across groups, reflecting a consensus on sustainability's importance. Still, the comparatively lower weight assigned to social acceptability raises concerns about potential public resistance, particularly regarding feedstock competition and land use.

Moreover, while SPK emerged as the preferred alternative, its economic and technical challenges should not be underestimated. High production costs, infrastructure requirements, and dependency on technological advancements remain critical barriers. Similarly, HVO, while promising, requires significant feedstock availability, which raises questions about its scalability and impact on food security. To address these challenges, a multi-stakeholder strategy involving policymakers, industry leaders, and researchers is essential. Future studies should explore hybrid solutions that combine SAF alternatives or integrate emerging technologies, such as hydrogen and electric aviation. Additionally, longitudinal research tracking SAF adoption over time can provide a more dynamic understanding of its feasibility and impact. Overall, while this study provides a structured evaluation of SAF alternatives, it also highlights the need for continuous innovation, policy support, and cross-sector collaboration to overcome economic, technical, and social barriers.

CONCLUSIONS

The use of Sustainable Aviation Fuel (SAF) has been recognized as a promising solution for the aviation industry to achieve sustainable development which is essential for promoting sustainable tourism practices. However, the successful implementation of SAF requires comprehensive evaluation and assessment to ensure its environmental, economic, technical, and social feasibility. This study employed the Analytic Hierarchy Process (AHP) approach to evaluate and prioritize the criteria for evaluating SAF and to provide a comprehensive evaluation of SAF practices.

Based on the AHP results, the environmental impact criterion was found to be the most important criterion for evaluating SAF practices, followed by economic feasibility, technical feasibility, and social acceptability. These findings highlight the critical need for the tourism industry to adopt SAF to mitigate its environmental footprint. Furthermore, the AHP approach was able to provide a comprehensive evaluation of SAF practices by incorporating the perspectives of various groups, including experts with different levels of experience and different job categories.

The AHP approach effectively evaluates and prioritizes criteria for Sustainable Aviation Fuel (SAF) assessment, offering insights for policymakers and aviation stakeholders to enhance sustainability in both aviation practices and tourism. Adopting SAF approaches that prioritize environmental impact, economic feasibility, technical feasibility, and social acceptability is crucial for supporting sustainable tourism. Several alternative solutions to reduce aviation's environmental impact include Synthetic Paraffinic Kerosene (SPK), which blends with conventional jet fuel and significantly lowers particulate matter emissions and contrail formation. Approved for commercial aviation, SPK presents a viable SAF option for the tourism sector. Another alternative, Hydrogenated Vegetable Oil (HVO), derived from waste or non-food grade vegetable oil, also reduces particulate matter and greenhouse gas emissions, making it attractive for sustainable aviation. Gas to Liquids (GTL) is produced by converting natural gas into liquid hydrocarbons, resulting in lower emissions of nitrogen oxides, sulfur oxides, and particulate matter compared to traditional jet fuel. However, GTL's production process is energy-intensive, raising questions about its long-term sustainability.

In conclusion, the AHP approach has provided a comprehensive vision into the evaluation of SAF options, indicating various layered factors importance to consider when selecting a SAF solution. The results of this study suggest that among the evaluated SAF options, HEFA and FT-SPK are the most viable alternatives, followed by HVO and CTL. However, it is important to note that ongoing research and development in the field of SAF may lead to new and improved alternatives in the future. Therefore, continued evaluation and comparison of SAF options using rigorous and objective approaches such as AHP will be essential for promoting sustainability in the aviation industry.

Limitations

Despite the comprehensive evaluation of Sustainable Aviation Fuels (SAF) using the Analytic Hierarchy Process (AHP), this study has several limitations that should be acknowledged. The study was based on a relatively small sample of 17 aviation specialists from 12 countries. While the inclusion of participants from diverse job categories (pilots, air traffic control officers, engineers, managers, and researchers) and experience levels provides a range of perspectives, the limited sample size may constrain the generalizability of the findings. A larger, more representative sample could improve the reliability and robustness of the results, particularly for drawing conclusions applicable to the global aviation industry.

The AHP methodology heavily relies on subjective expert evaluations, which may introduce biases influenced by individual roles, experiences, and perceptions. While the geometric mean aggregation method was used to minimize these

biases, the inherent subjectivity of the pairwise comparison matrices (PCMs) cannot be entirely eliminated. Experts' exposure to specific SAF technologies or regional aviation policies may also have shaped their preferences, potentially limiting the objectivity of the results. The study evaluated three primary SAF alternatives - Synthetic Paraffinic Kerosene (SPK), Hydrogenated Vegetable Oil (HVO), and Gas-to-Liquids (GTL). While these are recognized as promising options, emerging SAF technologies, such as power-to-liquid (PtL) fuels, bioethanol-based fuels, or hydrogen-powered aviation, were not considered. This limited scope may restrict the study's applicability as new technologies are developed and adopted in the aviation sector. The study does not explicitly address the influence of regional variations in SAF production, policy incentives, and infrastructure readiness. Differences in government regulations, availability of feedstocks, and economic subsidies could significantly impact the adoption and feasibility of SAF alternatives. Future studies could integrate a regional analysis to capture these contextual dynamics more effectively.

While social acceptability was included as a criterion, the study primarily focused on expert opinions, neglecting broader public perceptions of SAF. Given the growing importance of societal acceptance in the transition to sustainable fuels, future research should incorporate public attitudes, concerns about land use, and potential resistance to SAF adoption. The AHP method, though rigorous, provides a static assessment of SAF alternatives at a specific point in time.

However, technological advancements, policy changes, and evolving market conditions can rapidly influence the viability and preference for SAF options. A longitudinal approach or dynamic decision-making models could better capture these changes over time. The study highlights environmental and economic feasibility as critical factors but does not delve deeply into the trade-offs between these criteria.

For example, the production of SAF alternatives, such as HVO and GTL, involves processes that may indirectly contribute to environmental issues like land use changes, biodiversity loss, and water consumption. Further analysis of such trade-offs is necessary to provide a holistic understanding of SAF sustainability.

While the findings of this study offer valuable insights into SAF evaluation and preferences, these limitations underscore the need for future research to address the identified gaps. Expanding the sample size, incorporating emerging SAF technologies, considering regional and public perspectives, and adopting dynamic frameworks will strengthen the understanding of SAF adoption and its role in achieving aviation sustainability.

Nomenclature: SAF: sustainable aviation fuel; AHP: Analytical Hierarchy Process; MCDM: Multiple Criteria Decision Making; PCM: Pairwise comparison matrix; ATCOs: Air traffic controllers; CR: Consistency Ratio; SPK: Synthetic Paraffinic Kerosene; HVO: Hydrogenated Vegetable Oil; GTL: Gas to Liquids

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TOURIST'S BEHAVIORAL INTENTION TO VISIT SUKHIRIN IN NARATHIWAT PROVINCE: AN ECOTOURISM DESTINATION OF THAILAND

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Abstract: Narathiwat Province in the southernmost part of Thailand aims to shift its economic structure to a more sustainable and high-value tourism industry, with an emphasis on inclusive development of Sukhirin District to prominent ecotourism destination. This study examines factors influencing the behavioral intentions of Thai tourists travelling in Sukhirin, focusing on destination image, tourist satisfaction, reference group influence, and perceived risk. The structural equation model was employed to analyze the data obtained from 300 responses of Thai tourists, who travelled in Sukhirin district, Narathiwat province, Thailand. The demographic profile of respondents indicates that most tourists were male, with an average age of 29. A large proportion were self-employed, earning an average monthly income of approximately 18,299 THB. The majority identified as Muslim from Narathiwat and neighboring southern provinces. In terms of expenditure, they demonstrated relatively high spending with 2,229.82 THB per trip, primarily allocated to transportation, food, and accommodation. Moreover, the results showed that destination image significantly drives tourists' behavioral intentions, particularly in terms of their willingness to revisit and further recommend it to other potential tourists. The prominent Sukhirin's image are its reputation and the valuation of traveling. Likewise, a positive destination image also significantly enhances tourist satisfaction. As a result, improving the destination's image can effectively boost satisfaction levels among tourists. Furthermore, social influences by sharing information and experiences, especially from friends and family members, have a positive impact on the destination's image. Conversely, perceived risks like natural disasters, unrest situations and accidents negatively affected the tourism image of Sukhirin. To strengthen and sustain tourism growth of Sukhirin through enhancing tourists' behavioral intentions, stakeholders should focus on maintaining a positive destination image, emphasizing Sukhirin's natural attractions and its cultural richness, and leveraging word-of-mouth marketing through social networks to boost interest and trust in this destination. Additionally, investing in strengthening safety measures can also increase tourists' confidence and encourage both first-time and repeat travel to Sukhirin in the future.

Keywords: border tourism, Hala-Bala Wildlife Sanctuary, sustainable development, unrests, revisits

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INTRODUCTION

Presently, Thailand is one of popular destination for global tourists, since Thailand is well known for its richness of diversity of tourism such as unique culture, exotic foods and beautiful tourist attractions. In 2023, there were over 28 million tourists traveling to Thailand, generating income for the country amounting to 1.512 billion baht (Tourism Authority of Thailand, 2024). However, in 2024 the Ministry of Tourism and Sports of Thailand announced 5 policies to stimulate tourism namely: 1) driving tourism that tourist can travel up to 365 days 2) application of soft power to navigate the tourism industry in Thailand 3) emphasizing on the involvement of safety and hospitality 4) responding to sustainable tourism 5) cross border tourism in ASEAN (Sorthong et al., 2024).

Narathiwat province is one of the three southern border provinces of Thailand considered as the connecting gate to neighboring countries, especially the East coast of Malaysian peninsular and the bordering the Gulf of Thailand. From the border, there are readily infrastructures to connect with other regions by land, rail, port and airport. However, Narathiwat province's economic structure still relies primarily on agriculture sectors and potential tourism sectors (the United Nations Development Programme, 2024). While in 2022, the Office of National Economic and Social Development Council (NESDC) stated that this province is still exhibiting the lowest GPP per capita in Thailand, with 1,740 USD per year (Muangthong & Sarntisart, 2017) and still being affected by the insurgency in the deep south of Thailand (Praprom & Laipaporn, 2022). Therefore, tourism is one of the areas of strategic development plans of Narathiwat province in order to reduce poverty or insurgency in this location, which is considered as a mechanism for eliminating both problems through providing high value services under the concept of natural tourism and cultural tourism.

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Sukhirin is a district in Narathiwat province as shown in Figure 1, located near the Malaysian border, close to the Buketa checkpoint in Waeng district. This district has held historical significance since ancient times due to the discovery of gold mines (To Mo gold mine) and its important role as the origin of the Telubin River, or Sai Buri River, as documented historically in a report on the exploration of the Telubin River in 1894 (Louis, 1894). Today, Sukhirin is an important agricultural area, featuring terraced rice fields and renowned fruit plantations, including durian and Longkong or Southern "*langsat*". It has also become an ecotourism destination, known for its beautiful natural landscapes. Furthermore, Sukhirin is the house of the precious forest Hala-Bala Wildlife Sanctuary, considered as one of the world's significant bird-watching sites. The Thai government has initiated efforts to promote this area as a UNESCO Natural World Heritage site.

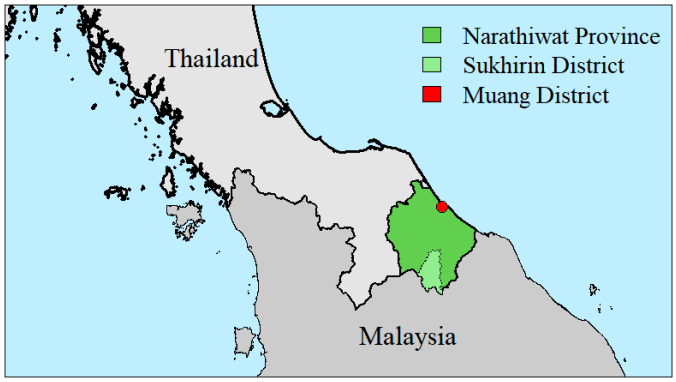


Figure 1. Sukhirin District in Narathiwat Province of Thailand (Source: Authors)

Narathiwat Province aims to shift its economic structure from an agricultural dependency to a high-value tourism industry, with a focus on enhancing tourism in Sukhirin. This study aims to investigate factors influencing the behavioral intentions of tourists, particularly Thai tourists, to revisit or recommend to other potential tourists including tourists' satisfaction, destination image, tourists' risk perception, and the influence of reference groups. The findings of this study will further provide valuable insights for policymaking in tourism development, promoting income distribution through tourism, alleviating poverty, expanding provincial products, and increasing per capita income.



Figure 2. A) Sea of Mist viewpoints; B) Traditional local food set at the Chulabhornpattana 12th community; C) Gold panning activity at Saiburi River in Sukhirin District on December 18, 2022 (Source: Authors)

LITERATURE REVIEW

The study of factors influencing tourists' behavioral intentions has received significant attention in most tourism-related research, as understanding these factors is essential for designing effective marketing strategies and increasing destination competitiveness. Tourists' behavioral intentions, such as the intention to revisit or recommend a destination, are shaped by their perceptions and experiences of the destination itself. Key factors, including destination image, tourist satisfaction, reference group influence, and risk perception, are widely recognized as determinants of these intentions. Investigating these dimensions provides insights into how tourists perceive and evaluate destinations, while also aiding in the development of strategies aligned with tourist expectations that support sustainable tourism development.

Research on tourists' behavioral intentions offers valuable insights for developing marketing strategies that align with tourist expectations, which are essential for sustainable destination management (Kanokwongpaisarn et al., 2019). Behavioral intentions, such as the intention to revisit and recommend, are often rooted in positive experiences with

tourism services, activities, and amenities. Word-of-mouth recommendations, a key aspect of behavioral intentions, are strongly influenced by the positive experiences shared by consumers (Luong, 2023).

Similarly, revisits indicate tourists' satisfaction with the destination's offerings (Gangadhari et al., 2023). Structural equation modeling (SEM) is frequently applied to identify the factors influencing revisit and recommendation intentions (Seyfi et al., 2021; Deb & Lomo-David, 2021). In this study, tourists' behavioral intentions are measured through their intentions to revisit and recommend the destination to others.

Destination image can be divided into three dimensions: 1) Cognitive image, which includes individual knowledge and beliefs about the destination, such as landscape, culture, and nature; 2) Affective image, which reflects tourists' emotions, such as atmosphere and hospitality; and 3) Tangible image, which includes infrastructure, amenities, and accommodations—all of which positively influence the intention to revisit (Phi et al., 2021). Previous research has shown that destination image positively influences tourists' intention to revisit (Sobaih et al. (2024); Manyangara et al., 2023; Luvsandavaajav et al., 2022; Nam et al., 2022; Primananda et al., 2022; Atmari & Putri, 2021; Phi et al., 2021; Liang & Xue, 2021; Viana et al., 2021). This aligns with findings by Luvsandavaajav et al. (2022) and Liang & Xue (2021), who identified cognitive image (nature, culture, infrastructure, travel environment) and affective image (pleasantness, relaxation, excitement, friendliness) as positively impacting revisit intentions. Additionally, Nam et al. (2022) highlighted that perceptions of naturalness, attractiveness, and diversity positively influence the intention to return.

Beyond revisit intentions, word-of-mouth recommendations are another key aspect of tourists' future behavioral intentions. Previous studies have found that destination image also positively impacts tourists' intention to recommend the destination to others (Yağmur & Aksu, 2022; Viana et al., 2021). Ragab et al. (2019) reported that destination image positively influences the intention to share positive word-of-mouth recommendations. Yağmur & Aksu (2022) also found that affective image positively impacts recommendation intentions, while Viana et al. (2021) noted that perceptions of natural and cultural attractions, social and environmental adaptation, infrastructure, accessibility, price, and value positively affect revisit intention, recommendations, and the sharing of travel experiences. In measuring the three dimensions of destination image, this study utilizes six indicators: 1) natural image and 2) cultural image for the cognitive image dimension, 3) social image for the affective image dimension, and 4) destination reputation, 5) destination valuation and 6) eco-tourism management for the tangible image dimension. Consequently, this study proposes the following hypothesis:

H1: Destination image has a direct positive effect on tourists' behavioral intentions.

Tourist satisfaction is defined as the alignment between a consumer's expectations and their actual travel experiences. This satisfaction is measured by the extent to which tourism products and services meet or exceed tourists' expectations (Tri & Nguyen, 2024; Ge & Chen, 2024). Satisfaction derived from a tourism experience significantly influences tourists' future behavior. Previous studies indicate that higher tourist satisfaction positively impacts the intention to revisit (Foster & Sidharta, 2021; Mutia et al., 2020; Bayih & Singh, 2020; Chenchan et al., 2020). Additionally, tourist satisfaction positively affects tourists' intention to share their experiences through word-of-mouth recommendations (Chenchan et al., 2020). Therefore, this has led to the formation of the second hyphothesis which proposes:

H2: Tourist satisfaction has a direct positive effect on tourists' behavioral intentions.

Most research on the relationship between tourist satisfaction and destination image examines how destination image influences satisfaction levels. Findings generally suggest that a favorable destination image enhances tourist satisfaction (Ge & Chen, 2024; Bayih & Singh, 2020). Positive destination image is associated with increased tourist satisfaction, which, in turn, encourages greater intentions to revisit and recommend the destination to others (Mutia et al., 2020; Chenchan et al., 2020). Based on these findings, this study forms the third hypothesis:

H3: Destination image has a direct positive effect on tourists' satisfaction

Reference groups, or Subjective Norms, represent the expectations from social circles, such as family, friends, and social media influences, that influence individual behavior (Ajzen, 1991). These groups shape tourists' perceptions by sharing information and experiences, which can significantly impact destination image. Research indicates that reference groups, including social media influencers, can positively shape destination image (Omeish et al., 2024; Najjarzadeh et al., 2022). Tourists with a positive perception of a destination image are often more inclined to follow recommendations from their social circles (Jin et al., 2020). Thus, the researchers have hypothesized:

H4: Reference groups have a direct positive effect on destination image

Risk perception in tourism refers to the likelihood that tourists may encounter potential losses associated with tourism services, activities, or the destination itself, which can influence their destination image. Research has shown that higher perceived risks negatively impact destination image (Nazir et al., 2021; Liang & Xue, 2021). For instance, Yağmur & Aksu (2022) similarly noted that perceived risks across health, psychological, environmental, and financial dimensions negatively influenced the cognitive image. Hences, based on these findings, this study proposes:

H5: Risk perception has a direct negative effect on destination image

These hypotheses collectively provide a framework for understanding the roles of destination image, satisfaction, reference groups, and risk perception in shaping tourists' behavioral intentions, as illustrated in Figure 3.

MATERIALS AND METHODS

This study is a quantitative research project aimed at examining the factors influencing the behavioral intentions of Thai tourists visiting Sukhirin. Data was collected through questionnaires from Thai tourists who visited Sukhirin between February and April 2023. The survey gathered information on tourists' demographics, travel behaviors, attitudes toward investigated factors, and behavioral intentions, with a sample size of 300 respondents based on the considerations of

statistical reliability and representativeness. Respondents were selected through stratified random sampling method, ensuring a diverse and representative cross-section of the Thai tourist population in Sukhirin.

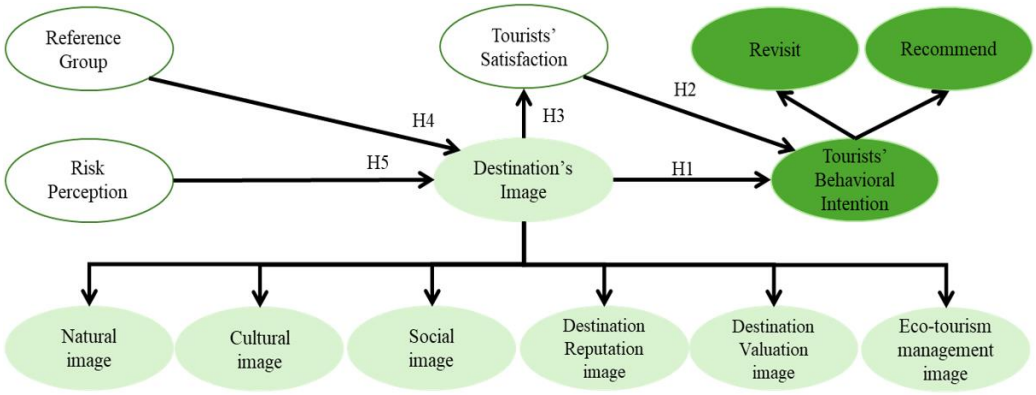


Figure 3. Research Hypotheses (Source: Authors)

This study utilized Structural Equation Modeling (SEM) to analyze the data and test the research hypotheses, specifically employing Covariance-based SEM. The R program with the "lavaan" package was used to conduct the SEM analysis. The structural model includes 11 latent variables and 28 measurement indicators, measured on a 3-point Likert scale ranging from disagree, neutral, to agree. These variables encompass behavioral intentions, and the associated determinants as outlined in the research hypotheses, as illustrated in Figure 1. Details of the measurement indicators for each latent variable are presented in Table .1

Table 1 Latent variables and their measurement indicators (Source: Authors)

Latent variable	Measurement indicators
Intention to revisit (RV)	- If I visit Narathiwat, I will try to find an opportunity to revisit Sukhirin (RV1) - I intend to revisit Sukhirin (RV2)
Intention to recommend (RC)	- I recommend my friend to travel to Sukhirin (RC1) - I recommend my family or relatives to travel to Sukhirin (RC1)
Natural Image (NT)	- Sukhirin has no pollution (NT1)
	- Sukhirin has a good environment (NT2)
	- Sukhirin has a clean natural environment (NT3)
Cultural Image (CT)	- Sukhirin shows a unique tradition (CT1) - Sukhirin has a rich cultural/historical heritage (CT2)
	- Sukhirin has a unique local historical culture (CT3)
Social image (SC)	- The way of life of people in Sukhirin is interesting (SC1)
	- People in Sukhirin are friendly, courteous and generous to tourists (SC2)
Destination Reputation image (RT)	- Sukhirin is widely known among tourists (RT1) - Tourist attractions in Sukhirin are widely known among tourists (RT2)
Destination Valuation image	- Product and services in Sukhirin are value for money (VA1)
(VA)	- Traveling expenses in Sukhirin are reasonable (VA2)
Eco-tourism management image (EC)	- Tourism management in Sukhirin supports the ecological initiatives (EC1)
	- Tourism management in Sukhirin is sustainable tourism management (EC2)
	- Tourism management in Sukhirin is responsible towards the environment (EC3)
Tourist satisfaction (ST)	- Satisfaction towards a price to pay for traveling (ST1)
	- Satisfaction towards people (ST2)
	- Satisfaction towards tourism activities (ST3)
	- Satisfaction towards the environment (ST4)
Reference groups' influence (RG)	- My family likes to visit Sukhirin the most (RG1) - Most of your friends recommend me to travel to Sukhirin (RG2)
Risk perception (RP)	- There might be a risk to life and property during travel due to natural disaster (RP1)
	- There might be a risk to life and property during travel due to unrest situation (RP2)
	- There might be a risk to life and property during travel due to an accident (RP3)

In addition to the interested latent variables, other observed variables are also investigated to represent tourists' demographic details and travel behaviors. These variables include age, monthly income, gender, educational level, occupation, religion, nationality, duration of stay, travel expenses, frequency of visits to Sukhirin, and mode of transportation.

In analyzing and testing the hypotheses with Structural Equation Modeling (SEM), ensuring the model's over-identification is essential for establishing robustness. This step involves verifying that the number of known equations

exceeds the number of parameters to be estimated. Parameter estimation is then conducted using the Robust Maximum Likelihood method, enabling precise identification of relationships between latent variables and observed indicators.

To evaluate the model's fit with empirical data, four key indices are used: Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). Together, these indices provide a comprehensive view of the model's alignment with observed data, offering insights into its appropriateness. If discrepancies arise between the model and empirical data, modifications will be considered. This iterative process aims to refine the relationships between variables, enhancing the model's explanatory power. Modifications will be made judiciously to ensure the model accurately captures the dynamics influencing tourists' behavioral intentions.

RESULTS AND DISCUSSION

1) Demographic and Tourists behavior

The majority of Thai tourists visiting Sukhirin are male, with an average age of 29. Most have attained a bachelor's degree and are primarily self-employed business owners, with an average monthly income of 18,299 THB. The majority are Muslim from Narathiwat and other southern provinces. Most Thai tourists visit Sukhirin primarily aiming for relaxation, while nature-based tourism is the next most popular reason. The average length of their stay is about 1.63 days. These tourists usually travel in small, self-organized groups, and the majority expressed that it is their first time visiting Sukhirin. Thai tourists tend to have higher average trip expenses than foreign tourists, with an average expenditure of 2,229.82 THB per trip. In terms of expense categories, transportation costs rank highest, followed by food and beverages, and accommodation.

2) Structural Equation Modeling

The first step in analyzing the structural equation model involves examining the correlation coefficients of the measurement indicators, as shown in Figure 4. It showed that measurement indicators within the same latent variable exhibit high correlation coefficients, visible through the clustering of green pixels along the diagonal of the diagram. Additionally, relationships were also observed between measurement indicators across different latent variables. For instance, the RP1-RP3 group has a clear negative correlation with the NT1-NT3 group, while the VA1-VA2 group shows a positive correlation with the EC1-EC3 group.

The second step is to perform Confirmatory Factor Analysis (CFA) to assess the suitability of the measurement indicators for the latent variables. The model's statistical values are as follows: the chi-square test yielded a value of 545.142 with 332 degrees of freedom, showing statistical significance. The CFI and TLI values are 0.953 and 0.946, respectively, which are close to the threshold of 0.95. The RMSEA and SRMR values are 0.046 and 0.078, of which both values are below the thresholds of 0.05 and 0.08, respectively. These results indicate that the model fits well with the empirical data, and the chosen measurement indicators are appropriate for measuring the latent variables.

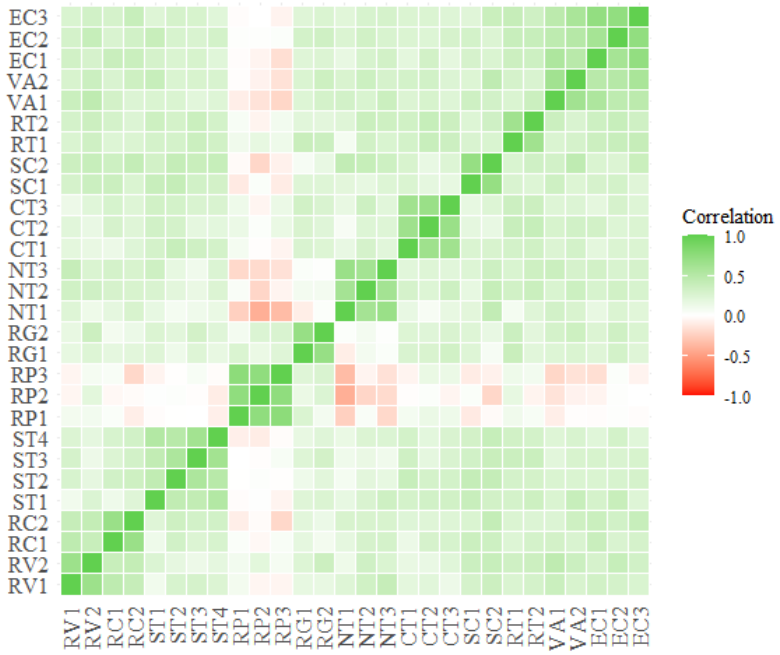


Figure 4. Correlation coefficients of investigated measurement indicators (Source: Authors)

Table 2 showed the loadings of the measurement indicators for each latent variable. It revealed that these loadings exceed 0.6, the AVE values are greater than 0.5, and both CR and Cronbach's alpha values are generally above 0.7. However, the CR values for a few latent variables are below 0.7 but still above 0.6.

According to Fornell and Larcker (1981), CR values slightly below 0.7 but above 0.6 are acceptable, particularly in exploratory research or when other indicators of construct reliability, such as AVE and indicator loadings, meet the necessary thresholds, thereby supporting the reliability of the constructs in this study.

Table 2. First-order Latent Variables, factor loadings of measurement indicators and relevant statistics (Source: Authors)

Latent Variables	Indicators	Loadings	AVE	CR	α
Tourists' Behavioral Intention to Revisit (RV)	RV1 RV2	0.800 0.834	0.667	0.672	0.800
Tourists' Behavioral Intention to Recommend (RC)	RC1 RC2	0.804 0.852	0.686	0.697	0.813
Natural Image (NT)	NT1 NT2 NT3	0.746 0.820 0.857	0.653	0.754	0.842
Cultural Image (CT)	CT1 CT2 CT3	0.804 0.815 0.822	0.661	0.772	0.853
Social Image (SC)	SC1 SC2	0.781 0.908	0.717	0.730	0.829
Destination Reputation Image (RT)	RP1 RP2	0.791 0.813	0.643	0.683	0.782
Destination Valuation Image (VA)	VA1 VA2	0.777 0.814	0.633	0.683	0.774
Eco-tourism management Image (EC)	EC1 EC2 EC3	0.810 0.826 0.867	0.696	0.804	0.868
Tourists' Satisfaction (ST)	ST1 ST2 ST3 ST4	0.699 0.724 0.742 0.742	0.528	0.751	0.807
Influence of Reference Groups (RG)	RG1 RG2	0.791 0.878	0.698	0.733	0.824
Risk Perception (RP)	RP1 RP2 RP3	0.841 0.869 0.879	0.744	0.791	0.900

Additionally, Table 3 presents the loadings of higher-order latent variables, which include Tourist Behavioral Intention (TBI) and Destination Image (DI). The loadings for the latent variables measuring TBI are both above 0.7, indicating that both Intention to Revisit (RV) and Intention to Recommend (RC) serve as effective indicators of TBI. For DI, only two latent variables, Destination Reputation Image (RT) and Destination Valuation Image (VA), have loadings above 0.7. This suggests that the prominent aspects of Sukhirin's image are its reputation and the valuation of traveling. The latent variables with loadings between 0.6 and 0.7, Social Image (SC) and Eco-tourism Management Image (EC), serve as secondary indicators of Sukhirin's image. Meanwhile, Natural Image (NT) and Cultural Image (CT) have loadings below 0.6, indicating that, from tourists' perspectives, Sukhirin's natural and cultural image are less distinctive.

Table 3. Higher order Latent Variables, factor loadings of measurement indicators and relevant statistics (Source: Authors)

Latent Variables	Indicators	Loadings	AVE	CR	α
Tourists' Behavioral Intention (TBI)	Intention to Revisit (RV) Intention to Recommend (RC)	0.787 0.776	0.676	0.778	0.800
Destination Image (DI)	Natural Image (NT) Cultural Image (CT) Social Image (SC) Destination Reputation Image (RT) Destination Valuation Image (VA) Eco-tourism management Image (EC)	0.524 0.594 0.687 0.751 0.737 0.686	0.670	0.905	0.884

Next, the structural equation model was established according to the model hypotheses, as shown in Figure 5. After estimating the model parameters, the Chi-square statistic was found to be 544.019 with 335 degrees of freedom, and the Chi-square statistic was statistically significant. The CFI and TLI values were 0.953 and 0.948, respectively, in which TLI was below the threshold of 0.95. Additionally, the RMSEA and SRMR values were 0.046 and 0.078, which were below the thresholds of 0.05 and 0.08, respectively. The TLI indicates that the model does not yet align well with the empirical data, necessitating modifications to improve the model's fit.

The model was subsequently adjusted by incorporating covariances between the latent variables VA and EC, as well as RP and NT. Additionally, it was found that the path for the second hypothesis, H2: TBI ← ST, was not statistically significant and contributed to model overfitting. This path was therefore removed from the model. A mediation analysis was also conducted to investigate whether ST acts as a mediator between DI and TBI. The results revealed that ST does not significantly mediate this relationship. Although DI has a direct positive effect on TBI, this effect is not transmitted through ST. As a result, this mediating path was excluded from the model.

Following these adjustments, the model fit indices improved. The Chi-square statistic was 468.548 with 334 degrees of freedom, remaining statistically significant. However, the CFI and TLI increased to 0.970 and 0.966, respectively,

both exceeding the recommended threshold of 0.95. The RMSEA decreased to 0.037, and the SRMR dropped to 0.071, both were below the recommended thresholds of 0.05 and 0.08, respectively. These enhancements indicate that the revised model, as depicted in Figure 5, now exhibits a strong alignment with the empirical data.

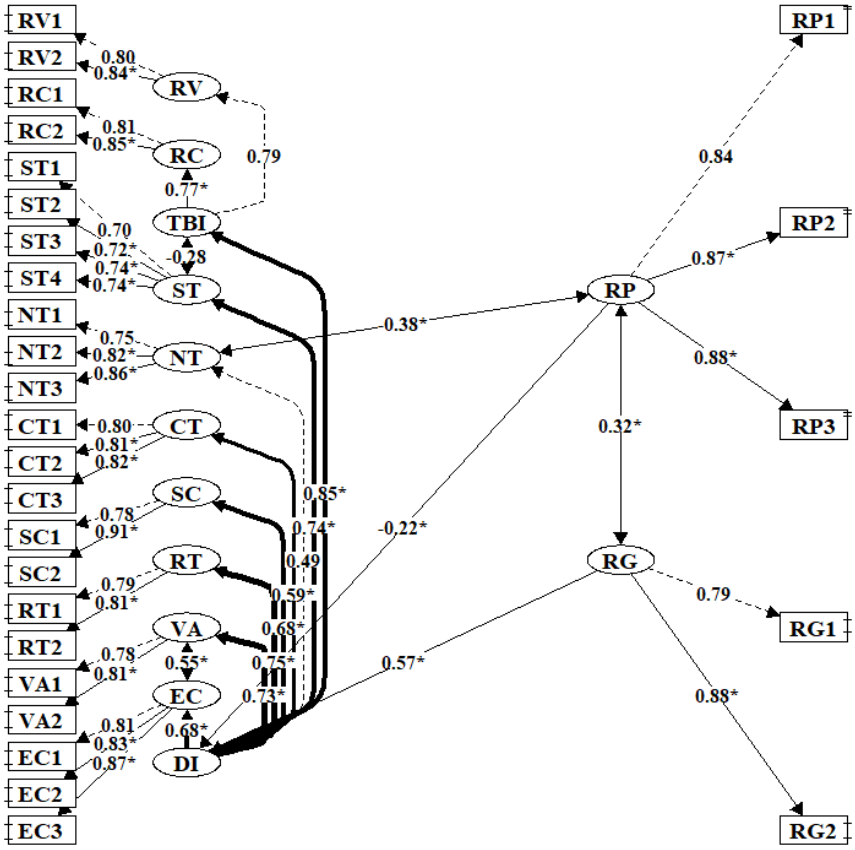


Figure 5 The revised Structural Equation Model (Source: Authors)

The structural model shows that Destination Image (DI) explains 72.4% of the variance in Tourist Behavioral Intention (TBI), indicating a strong predictive power of destination image in influencing tourists' intentions to revisit and recommend the destination. Furthermore, DI accounts for 54.1% of the variance in Tourist Satisfaction (ST), emphasizing its role in enhancing satisfaction levels. However, Reference Groups (RG) and Perceived Risk (RP) only explain 29.2% of the variance in DI. Following Table 4, the path TBI ← DI (H1) demonstrates a strong and highly significant positive effect, indicating that a favorable destination image is critical for driving tourists' behavioral intentions, such as encouraging repeat visits and positive word-of-mouth recommendations. On the other hand, the path TBI ← ST (H2) was found to be non-significant and was subsequently removed from the model. However, the path ST ← DI (H3) remains highly significant, highlighting that a positive destination image significantly enhances tourist satisfaction. Improving the destination's image can effectively boost satisfaction levels among tourists. The path DI ← RG (H4) shows that reference groups positively influence the destination image, while the path DI ← RP (H5) indicates that perceived risks negatively affect the destination image. These findings suggest that social influences significantly shape tourists' perceptions, while minimizing perceived risks can enhance tourists' overall views of the destination.

Table 4. Proposed hypotheses, their coefficients and testing statistics (Source: Authors)

Path		Hypothesis	Coef.	Std. Error	p-value	Std. Coef.
TBI	← DI	H1	1.461	0.246	.000	0.851
ST	← DI	H3	1.406	0.253	.000	0.735
DI	← RG	H4	0.264	0.048	.000	0.569
DI	← RP	H5	-0.096	0.037	.009	-0.221

The study confirms that a positive destination image significantly influences tourists' behavioral intentions, indicating that when tourists perceive a destination positively, they are more likely to revisit and recommend it to others. This finding aligns with previous research emphasizing the importance of cognitive, affective, and tangible aspects of destination image (Manyangara et al., 2023; Phi et al., 2021). Contrary to expectations, tourist satisfaction did not show a significant direct effect on behavioral intentions, while satisfaction is commonly seen as a predictor of revisits and recommendations (Chenchan et al., 2020; Mutia et al., 2020). The analysis highlights the positive impact of destination image on tourist satisfaction. Attributes like cleanliness, cultural uniqueness, and social environment enhance satisfaction, were found to be consistent with those findings by Bayih & Singh (2020). Thus, enhancing both cognitive

and affective dimensions of destination image is crucial for boosting satisfaction among tourists. Additionally, reference groups positively influence destination image, supporting Ajzen's (1991) theory of subjective norms.

Social networks and influencers play a crucial role in shaping perceptions, with social proof becoming increasingly important (Najjarzadeh et al., 2022). Finally, the study confirms a negative impact of perceived risk on destination image, aligning with Yağmur & Aksu (2022). Hence, high perceived risks can diminish the attractiveness of a destination, highlighting the need for effective risk management to maintain a favorable image of certain destinations.

CONCLUSION

Based on the findings of this study, it can be concluded that destination image is a critical factor influencing the behavioral intentions of Thai tourists visiting Sukhirin. Among the key indicators of Sukhirin's image, destination reputation image and destination valuation image are the most influential factors, followed by social image and eco-tourism management image. However, from the tourists' perspective, natural image and cultural image appear to be less distinctive. Additionally, reference groups and perceived risks are two significant factors affecting the destination image. The influence of friends, family, and relatives contributes positively to the destination image, while risks related to natural disasters, unrest situations, and accidents exhibited negative impacts.

To encourage tourists' behavioral intention, revisits and word-of-mouth recommendations, stakeholders involved in tourism in Sukhirin must sustain the positive destination image and enhance weaker aspects of tourism to increase their perceived value among tourists. This involves promoting the global value of Sukhirin's natural attractions, as well as leveraging informal marketing through reference groups that positively shape the destination image.

Additionally, implementing enhanced safety measures and risk management strategies can build tourists' confidence, hence encouraging them to visit and revisit Sukhirin.

The limitation of this study is its specific focus on the perceptions of Thai tourists visiting Sukhirin. However, it can become a benchmark to other destinations in Thailand or ASEAN. Future research should consider expanding the scope to include international visitors, particularly from neighboring Malaysia, or niche markets like birdwatchers and eco-tourists. Perhaps, future research can incorporate a variety of research methods to further validate the findings.

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THE ROLE OF GEOPARKS IN SUSTAINABLE TOURISM DEVELOPMENT: A CASE STUDY APPROACH

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Abstract: This study aims to explore the role of geoheritage in sustainable tourism development by integrating geosites into tourism planning and analyzing their impact on local economies, environmental conservation, and community well-being, and visitor relaxation. The study also examines how the principles of a circular society, which emphasize resource regeneration and human well-being, can be applied to enhance the sustainability and appeal of geoheritage-based tourism. A mixed-methods approach was used, incorporating both qualitative and quantitative analyses. Case studies from Azores Geopark, Jeju Island Geopark, and Marble Arch Caves Geopark were selected to evaluate the socio-economic and environmental impacts of geoheritage-based tourism. The results indicate that geoheritage-based tourism significantly contributes to economic growth and environmental conservation, particularly when supported by strong community involvement and infrastructure development. Statistical analyses revealed positive correlations between visitor numbers and economic benefits, as well as between community engagement and conservation outcomes. Additionally, the promotion of relaxation at geosites was found to reinforce both environmental stewardship and visitor satisfaction, aligning with circular society principles by creating a regenerative tourism model. Geoheritage-based tourism promotes sustainable development by balancing economic, environmental, and social dimensions. The findings suggest that successful tourism management requires careful planning, infrastructure investment, and active community participation. This study did not include a comparative analysis of areas that are underutilized in terms of both geoheritage and geosites with tourism potential, primarily due to limited resources and time constraints. Incorporating such a comparison would offer valuable insights into the key conditions required for the successful development of geoheritage-based tourism. It is anticipated that future research will address these limitations by broadening the scope of case studies to include a more diverse range of geographical contexts. Moreover, future studies should seek to integrate qualitative approaches alongside quantitative approaches in order to better understand the wider social and cultural role and impacts of geoheritage-based tourism, which can thus be an important tourism product worldwide.

Keywords: geoheritage, geosites, sustainable tourism, environmental conservation, economic development, community involvement, tourism planning, geoparks, circular society

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INTRODUCTION

The tourism industry is the fastest-growing sector in the world's economy; besides bringing economic gains, it fosters cultural exchange and improvement. In recent decades, niche tourism, called geotourism, has also attracted attention toward natural landscapes, geological formations, and geoheritage sites. Geotourism not only enriches the tourism experience with special insights into the geological history of the Earth but also plays an important role in environmental education, conservation, and community development. Interest in geosites and geoheritage as part of tourism is on the increase; this underlines the need for their preservation into the future as natural assets. Within the framework of a circular society, tourism development emphasizes not only sustainable resource use but also the promotion of human well-being. A key aspect of such well-being is relaxation, which fosters a mindful connection between visitors and nature.

By integrating relaxation opportunities within sustainable tourism, destinations can enhance both environmental conservation and the quality of life for tourists, aligning with the principles of a circular society where resources and experiences are shared and regenerated. The paper aimed to explore how geoheritage might play its role in developing sustainable tourism by integrating geosites into tourism plans, according to how such planning affects the local economy,

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environmental conservation, and the well-being of communities. Assessment, through case studies from three particular geoparks, uses a mixed-method approach, including both qualitative and quantitative analyses in measuring the impacts of geoheritage-based tourism on the socio-economic and environmental status.

It is also defined as the inventory of geomorphological sites, landforms, and landscapes of scientific, aesthetic, or cultural importance. Geotourism is developed around such concepts, focusing on specific sites where the geoheritage is well represented. Common geosites include mountains, caves, waterfalls, and rock formations that provide a window to the Earth's history and present state. Besides giving a boost to the local economy, such geosites raise environmental conservation awareness. They are living museums where interaction with the natural environment may be informative in as many different geological processes as have been taking place for many millions of years.

In the face of climate change and environmental degradation challenges of the 21st century, among others that border on socio-economic inequalities, serious attention needs to be directed towards the question of sustainable tourism development. As sustainable tourism increasingly requires integrated governance and innovation-driven policies, insights from related sectors can be instructive. For instance, Afadzinu et al. (2024) highlight how audit institutions can play a catalytic role in policy innovation, particularly within Ghana's industrial sector, offering lessons that could extend to tourism and natural resource management contexts. Tourism based on geoheritage might have huge potential in encouraging responsible tourism respectful of natural resources and bringing economic advantages at the local level. Geosites would play a dual role: an important tourist attraction as well as a means for taking conservation work forward. However, the prosperity of geoheritage-based tourism must be carried out in a carefully planned, managed manner and with community input. Without such elements, tourism can result in ecological degradation and compromise the very resources on which tourism would focus. This paper aims to discuss the potential and role of geoheritage in the processes of sustainable tourism development, especially in relation to the integration of geosites into tourism planning. Supported by a literature review and several worldwide case study analyses, this paper will go on to discuss the level at which geoheritage-based tourism is able to contribute to economic development, environmental conservation, and community well-being. The subsequent sections will then highlight the key themes within the literature, outline the methodological approach adopted in this study, present findings of the analysis, and discuss the implications for tourism planning and policy.

The authors formulated the following hypotheses:

1. Visitor numbers in geoparks positively impact local economic growth.
2. Higher community involvement leads to better conservation outcomes in geoparks.
3. Increased visitor numbers lead to greater environmental degradation in geoparks.

LITERATURE REVIEW

1. The Concept of Geoheritage and Geosites

In the last two decades, the attention of scientific debates and policy has increasingly focused on the concept of geoheritage. It can be defined as the identification, inventorying, and protection of the geological objects that present particular scientific, educational, or cultural value (Carrión-Mero et al., 2021; Bobrowska et al., 2024; Suzuki & Takagi, 2018). For this reason, it is an important component in natural heritage management and conservation (Bobrowska et al., 2024; Hose, 2016b). Geoheritage sites allow a glimpse into Earth's geological history and emphasize natural processes that include volcanism, erosion, sedimentation, and tectonic activity (Bentivenga et al., 2019; Migoń & Pijet-Migoń, 2023). In the case of geoparks, operators have an easier task. It is not necessary to select a site with the help of artificial intelligence or experts. The exact profile is also clear: offering maximum scenery to visitors with minimal environmental damage (Módosné et al., 2024). These sites also contribute to sustainable tourism development, particularly through geotourism, which can support local economies and promote environmental education (Irfan et al., 2024; Štrba et al., 2024, 2012; Lee & Jayakumar, 2021; Newsome & Dowling, 2018).

2. Geotourism as a Sustainable Development Strategy

Geotourism is tourism grounded in the attractiveness of a region's geology that has been forwarded in developing as a way of sustainable development. The National Geographic defines it as a tourism that sustains the geographical character of a place in environment, culture, aesthetics, and heritage, according to Muka et al., 2024. Geotourism contrasts with other nature-based tourism in that it focuses squarely on geoheritage and geosites. This will provide the visitors with valuable insight into Earth's geological and geomorphological processes, thus enabling them to appreciate the natural environment much more.

Several works identify economic and environmental relevance of geotourism. As Lopes et al. (2024) expand on, geotourism diversifies the economies of local people by attracting tourists to visit less frequently traveled rural parts. It would reduce environmental pressure on classic tourist destinations, adding more sources of new income for locals. This will be important in building the need to avert overuse and degradation of geosites and so promote their conservation. Navarrete et al. (2022) stated that proper management of geosites within the areas has helped in striking a balance between activities linked to tourism with conservation measures.

3. Geoparks: Integrating Geoheritage and Tourism

The formation of UNESCO Global Geoparks was viewed as a vital milestone in the history of geoheritage conservation with tourism associated with it in mind (Mikulic et al., 2024; UNESCO, 2023). The UN defines geoparks as that specially designated area elaborating geological sites of interest requiring management in all of their various aspects over an extended period for conservation, education, and economic viability (Temesgen & Terene, 2024). Such areas are important not only for

protecting geological heritage but also for promoting the economy of an area through geotourism Henriques et al. (2011). The double focus ensures that there is maintenance of the geological heritage and, at the same time, the provision of economic opportunities for the neighboring communities; hence, a conducive outlook for the sustenance of tourism and conservation Ferrando et al. (2024). Currently, UNESCO recognizes over 160 Global Geoparks from the Azores Geopark in Portugal to Zhangye Danxia Geopark in China UNESCO, 2023. These parks do not serve just as examples of how geological heritage is being used sustainably but also how tourism can be artfully embedded in the economic development activities of local communities. The chances of economic benefits have made geoparks a very attractive method for less-privileged and rural areas to exploit their natural resources but at the same time conserve them (Carrillo-Hernández, 2024). Various studies on geoparks demonstrate that geoheritage combined with tourism turns out to be economically and environmentally beneficial, leading to the awareness of the environment, infrastructures, and engagement of local communities in its conservation policies (Jon et al., 2024; Hose, 2016a). For example, the increased environmental awareness fostered by the creation of geoparks may call for more responsible behavior from tourists and the local community, thereby making long-term conservation objectives easier to attain (Hose, 2016b). The better infrastructure that usually comes with the designation of geoparks serves to improve conditions not only for visitors but for the livelihoods of local residents, with good roads and facilities.

4. Challenges in Geoheritage-Based Tourism

Despite many of the gains that may be realized through geoheritage-based tourism, there are a number of issues that need resolving if it is to be considered sustainable. It has long been an adage that increased tourist numbers lead to increased levels of environmental vulnerability. Research conducted earlier shows that physical destruction of trampling, littering, and vandalism can increase with geosites' popularity (Alfama et al., 2024). More than that, all the infrastructural development required for tourism includes roads, hotels, visitor centers, among others, which may bring huge interruptions to nature and the level of local biodiversity Hose, 2016a. In most cases, even minor disturbances can be catastrophic and long-term in sensitive ecosystems. Another striking point is the total or partial geoheritage unawareness and non-comprehension by tourists and local people. Most people visiting these geosites do not understand their scientific or educational values and, therefore, simply believe them to be beautiful places. Failure to learn of them results in practices that are non-sustainable and include take-away of rocks or fossils for souvenirs and reduced geological integrity of the site as a whole Newsome & Dowling, 2018). However, such activities not only reduce the value of the geosite but in most cases lead to the irretrievable loss of important geological features. An important component for the success of geoheritage-related tourism is community involvement. Studies have shown that, in many cases, local communities are not fully consulted and included in the strategic planning and management of geosites (Zhang et al., 2024). Lack of engagement often leads to a conflict of interest between conservation objectives and the development interests of the local communities, more so in rural areas where tourism can be a key economic activity. It reduces the probability of communities supporting conservation that isn't inclusive enough regarding decision-making processes, which in turn might erode the sustainability of geoheritage tourism.

5. Best Practices for Sustainable Geoheritage Tourism

Various ideal strategies have been put forward for managing this contentious debate at the level of academic scholarship regarding how to balance tourism development with geoheritage conservation. The most heated debates now revolve around the need for management practices that balance tourism development with protection of geoheritage in a sustainable manner (Santangelo & Valente, 2020; Xu & Wu, 2022). The recommended plans for action may include visitor education, location monitoring, and sustainable infrastructure development, because these are critical components in the protection of such vital geological sites of interest to a country (Marlina, 2016). By developing structures like boardwalks and allocated viewing points, the fragile structures of geological interest could be saved and, at the same time, their utilization by tourists allowed within the set boundaries of interaction with the site (Sisto et al., 2022). The development of environmentally sustainable infrastructures would be more likely to preserve the physical integrity of the geological sites, thus allowing an increase in visitor satisfaction with an opportunity that was thoughtful and well-informed (Gou et al., 2024; Quesada-Valverde & Quesada-Román, 2023). Recent studies also highlight the importance of understanding generational differences in attitudes toward work and sustainability, particularly for younger generations According to Szabó-Szentgróti et al. (2016), Kőmüves et al. (2023) and Németh et al. (2023), Generation Y's work vision emphasizes both flexibility and values such as sustainability, which are crucial for the success of geoheritage-focused tourism models. Incorporating such perspectives can help design tourism strategies that resonate with modern expectations while conserving resources for future generations.

To effectively promote tourism that focuses on geoheritage, it is essential for stakeholders to engage local communities, governmental authorities, and the private sector through collaborative partnership strategies (Mehdioui et al., 2022; Özgeriş & Karahan, 2021). This collaborative framework is crucial as it guarantees an equitable distribution of tourism-related benefits and ensures that the perspectives of those most impacted by the expansion of tourism are adequately represented (Mirari et al., 2020). These initiatives can better allow participation in decision-making by local communities and ensure that they derive economic benefits from tourism through efforts at capacity development, the promotion of local goods and services, and job opportunities in related sectors (Štrba et al., 2020). Additionally, community-led initiatives often lead to a more sustainable form of tourism, since they are inherently part and parcel of local traditions and values in consonance with conservation (Singtuen & Won-In, 2018). Moreover, competition and collaboration within cross-functional teams have been found to play a significant role in knowledge sharing and sustainable practices in tourism (Ton et al., 2022). This aligns with the need for cohesive teamwork among various stakeholders in the geoheritage sector to ensure that knowledge and resources are utilized efficiently. In sum, education and interpretation are some of the available opportunities whereby

tourists may engage with the geoheritage presented before them (Agastya et al., 2024; Kubalíková et al., 2022). Interpretive signs, guided tours, and educational programs greatly educate the visitors on the geological significance of the geosites, thereby encouraging better appreciation for nature by the tourists (Marlina & Natalia, 2016). These educational programs go beyond mere information transfer, instilling a sense of responsibility in the tourist. Indeed, when tourists are educated concerning the susceptibility of geosites, they are more likely to engage in behaviors that reduce their ecological impact, such as adhering to pre-identified trails, avoiding littering, and respecting local customs and traditions (Štrba et al., 2023). Educational activities are most influential in shaping responsible behavior in tourists, hence reducing the adverse impacts of tourism on geosites. In brief, due integration of comprehensive educational measures can, in turn, serve as a useful tool for the conservation of geoheritage through tourism (Marlina, 2016; Santangelo & Valente, 2020). Relaxation is increasingly seen as a vital component in sustainable tourism, aligning with the values of a circular society. Destinations that offer relaxing, eco-friendly experiences contribute to a model where tourists not only consume fewer resources but also engage more meaningfully with their environment. This holistic approach, where well-being and environmental sustainability are interconnected, reflects the essence of a circular society, where both the natural and human elements are nurtured.

METHODOLOGY

This present research is based on a mixed-methods approach that incorporates qualitative and quantitative studies in identifying the status of geoheritage in terms of contributing to sustainable tourism development. The research will explore the incorporation of geosites into tourism planning and the consequences such efforts have on local communities, environmental conservation, and economic growth. Case studies and statistical analysis utilized in this study will aid in gaining a holistic understanding of benefits and challenges associated with geoheritage-based tourism.

1. Case Study Selection

The research method of case study was selected for allowing in-depth analysis of certain geosites and their contribution to tourism development. In complex phenomena within real-world situations, case studies enable minute examination of the inter-relationships that exist between tourism, nature conservation, and community development. Three geosites will be selected for the present study due to their international recognition and value, namely: the Azores Geopark (Portugal), the Jeju Island Geopark, in South Korea, and the Marble Arch Caves Geopark, in Northern Ireland. These have been selected because they represent different geographical contexts, and different strategies are being used or have been used for tourism management and conservation.

2. Data Collection

Data were gathered from primary and secondary sources. Primary data included interviews with the local stakeholders, such as park managers, community leaders, and tourism operators, along with on-site observations regarding the behavior of tourists and how sites are managed. Secondary data will be obtained from reports issued, academic articles, and government documents dealing with geosites and geoparks management. Some key databases were used. Data for the UNESCO Geopark is relatively all-rounded, with numbers on tourism, economic benefits, and conservation coverage from different geoparks in the world. The UNWTO Database provides international measures about arrival and the statistics of tourism receipts. The sources are comparable with Eurostat for data on tourism in Europe and take into account similar factors to the number of visitors and regional economic effects. Besides, within the World Bank Databank, there are other kinds of economic indicators like GDP and employment through which to consider economic impacts attributed by tourism. The impacts of green human resource management (GHRM) practices can similarly be linked to the economic impacts of tourism, especially when sustainability practices are embedded in organisations (Miah et al., 2024a; Gelencsér et al., 2024). Green tourism initiatives such as eco-friendly hotels or sustainable travel options can boost local economies by attracting environmentally conscious tourists who can spend more on sustainable products and services (Miah et al., 2024b). Considering the environmental impact brought about by geo heritage-related tourism, data from the EPI is noted in the line of environmental health and ecosystem vitality.

3. Data Analysis

In turn, quantitative data were analyzed, such as visitor numbers, economic indicators, and environmental impact assessments, through descriptive and inferential statistics. Merging the qualitative and quantitative findings provided a comprehensive overview of geoheritage in the sustainable development of tourism.

In this research, a holistic approach to the methodology would be utilized to ascertain the impacts of tourism on economic and environmental perspectives. Descriptive statistics refer to the summarizing of the key characteristics of the dataset. This includes things such as the number of visitors, economic indicators of revenue generated from tourism and levels of employment among the locals, and environmental factors such as waste per visitor and biodiversity. Such statistical analysis is carried out and serves to summarize basic characteristics and trends observable within the data set.

The second step of analysis, bivariate statistical methods, further investigate the relationships between pairs of variables. For example, the nature of the relationship that exists between tourism development and environmental conservation—that is, how such factors like visitor numbers relate to waste produced and ecological breakdown is explained through correlation analysis. It further employs t-tests and ANOVA in determining mean economic benefits, say earnings and job opportunities, between and among locations or time periods. Chi-square testing further strengthens the analysis of categorical data, such as degrees of community involvement and their impact on conservation outcomes.

Because tourism development is complex and thus affected by a host of factors, multivariate statistical techniques are used for an in-depth understanding. Multiple regression analysis is a technique that helps visualize the effects that varied independent variables, such as the count of visitors, infrastructure enhancement, and community involvement, have on dependent variables like economic growth and environmental preservation. In data dimensionality reduction, factor analysis is used to identify the underlying patterns that affect successful geoheritage-based tourism. Cluster analysis helps in forming groups comprising geosites or communities with somewhat similar characteristics, for example, those with highly degrading environmental qualities versus those with effective conservation practices. Therefore, timeseries analysis could be important in the description of trends and patterns of data by time dimensions. Techniques such as ARIMA are hence important in projecting the future face of tourism growth and its effects on local economies and environments. Additionally, spatial analysis through geographic information systems is conducted to attain an understanding of geographic influences on tourism and conservation. Spatial regression encapsulates changes across geography that affect tourism pattern changes and conservation efforts related to proximity to urban centers, accessibility, and the distribution of natural resources. Hotspot analysis identifies the areas within geosites with the highest tourist pressure and at the most risk of environmental degradation. The concept of relaxation is also factored into the analysis, recognizing that sustainable tourism should promote not only environmental and economic benefits but also contribute to human well-being. In a circular society, the restoration of natural resources goes hand-in-hand with the restoration of human energy, positioning relaxation as a core outcome of responsible tourism planning. This study assesses how geosites can facilitate such restorative experiences while minimizing ecological impacts.

RESULTS

1. Case studies

1.1. Case Study 1: The Azores Geopark (Portugal)

It is located in the North Atlantic Ocean and covers the total area of the Azores archipelago. It is recognized as a UNESCO Global Geopark, since its rich volcanic heritage hosts crater lakes, lava tubes, and hot springs. This integration of geoheritage into tourism contributed to positioning the Azores as one of the leaders of ecotourism. These findings of the case study describe how geoheritage-based tourism can support environmental conservation and economic growth in a region.

Visitor Trends and Economic Impact

In the past decade, Azores Geopark has seen a steady growth in visitors. According to the statistics from the Regional Government of Azores, between 2010 and 2020, tourism arrivals experienced a growth of 42%, driven by combined segments of nature-based and adventure tourism. International visitors are the higher number compared with the locals, mostly coming from Europe and North America, due to its unique volcanic landscapes.

In fact, the economic impact of tourism has been considerable, as this has proved to be an important factor in the local economy. On a regional economic level, some reported that tourism-related activities made up 12% of the GDP of the Azores in 2020. Because of the arrival of tourists, local businesses such as hotels, restaurants, and tour operators have prospered and ensured regular employment for the residents. Additionally, tourism based on geoheritage aids further development pertaining to the opening of niche markets in geology-themed tours and eco-friendly accommodations.

Environmental Conservation and Challenges

In the Azores Geopark, much has been done in terms of measures to ensure that the development of tourism mirrors the ambitions of environmental conservation. For example, the creation of designed walking trails and observation platforms in many geosites, such as Sete Cidades and Furnas, has diminished the negative environmental consequence of tourism. This provides the appropriate conditions to prevent soil erosion and damaging vegetation from high visitor mobility.

However, there remain emergent challenges with regard to management of impacts of tourism on the environment. Higher levels of visitation have increased concerns around the issue of waste production, management, and disposal, particularly where this occurs more remotely from major urban centers where infrastructure is less well-developed. Park managers have also noted during interviews that public education campaigns have increased awareness around appropriate behaviors for responsible tourism; however, some tourists continue to act in unsustainable ways to the Parks' fragile volcanic landscapes, including littering and making trails off of designated paths.

The Azores Geopark has positioned itself as a destination that aligns with the principles of a circular society by promoting relaxation through eco-conscious tourism. Visitors are encouraged to immerse themselves in the tranquil landscapes, which not only enhances their personal well-being but also supports long-term conservation efforts. By fostering relaxation, the park contributes to a cycle of sustainable use and restoration, both for the environment and for the visitors.

1.2. Case Study 2: Jeju Island Geopark (South Korea)

Jeju Island is a UNESCO Global Geopark that is located off the southern coast of South Korea. It is a land of breathtaking beauty with its well-represented volcanic landscapes, which include Hallasan Mountain, and a tuff cone known as Seongsan Ilchulbong. This geopark has been developing more and more as a destination for domestic and international tourism, where geoheritage-based tourism lies at the heart of such developments.

Economic Development and Local Involvement

Tourism is the most important basic industry to Jeju Island, with a structural proportion of about 30% in regional GDP. The geopark has attracted visitors who fall into different categories: nature tourists, adventure tourists, and cultural tourists. Accommodation businesses in this area have benefited substantially from tourism, as evidenced by the steady growth in the hospitality industry on the island. In addition, the provincial government of Jeju has promoted the development of sustainable tourism products, such as eco-friendly accommodations and local handicrafts, which help to further support the

local economy. More precisely, interviews with local stakeholders have identified that community involvement has been at the heart of Jeju's tourism strategy for many years. Management of the geopark co-operates with the residents to help develop the tourist industry for the benefit of the community members. In this respect, the local guides are trained to conduct geology tours, and some of the revenues coming from tourism are returned to the community for the purpose of improving infrastructure and conducting environmental education programs. This has meant in practice that local citizens can feel ownership of, and actively be engaged in the protection of, the geoheritage of the island.

Environmental Impacts and Mitigation Efforts

As experienced in the Azores, Jeju Island has faced challenges related to environmental concerns about tourism management. The level of attractiveness for tourism has placed a higher demand on natural resources of this island, especially in terms of water consumption and energy. In the latter case, bioenergy has also come to the fore in recent years (https://hybridpowersystems.org/powersystem_azores/). During peak tourist seasons, the dense stream of visitors raises strains on the island's infrastructure and therefore raises concerns in terms of overdevelopment and degradation of the environment. Conversely, the Jeju provincial government has implemented different mitigation measures to develop sustainable tourism: prohibition of new hotel construction, regulation of water usage, and promotion of public transportation associated with eco-friendly modes of transportation, like electric buses and bicycle rentals. Furthermore, geopark management has invested in raising public awareness through campaigns to educate tourists on the importance of continuing to respect nature. Indeed, surveys among visitors show that this has some positive effect in that 78% of those questioned said they were more conscious of environmental issues after their geopark visit.

1.3. Case Study 3: Marble Arch Caves Geopark (Northern Ireland)

The Marble Arch Caves Geopark is located at the border between Northern Ireland and the Republic of Ireland. It boasts complex landscapes of limestone karst with spectacular underground caves combined with very high biodiversity. This represents one of the UNESCO Global Geoparks that has become a model for geoheritage conservation and integration with sustainable tourism development.

Tourism Growth and Economic Benefits

Designated a UNESCO Global Geopark since 2001, the Marble Arch Caves Geopark has experienced exceptional increase in visitors to the park. According to records by park management, annual visitation increased from 50,000 in 2005 to over 100,000 in 2019. Most of the visitors are domestic tourists, though international visitors have increased in the recent years. This situation has had quite a positive impact on the economic sphere, especially in the local environment. Tourism businesses mushroomed featuring guided cave tours, accommodations, and souvenir shops and have consequently opened up employment opportunities for the people in the community. The number of such businesses now generates 8% of the regional GDP according to economic reports with the Marble Arch Caves as its main attraction. Additionally, international interest is much higher after the geopark was accorded UNESCO site status, drawing in further investment in tourism infrastructure and marketing. Environmental Sustainability and Education. The environmental education also gets much emphasis within the Marble Arch Caves Geopark. An extended education program was developed by the management of the geopark, targeted at raising the awareness of the geological and ecological values of the area. Guided tours can be offered for visitors, explaining the formation process of the caves and the regional karst landscape. Further, it develops in-school educational workshops and courses for schools and local groups to improve geoheritage conservation knowledge. The geosites, like all others, face challenges in terms of how to balance tourism growth with environmental sustainability. Tourism traffic has been on the rise, something that has always raised eyebrows as to how it will affect the fragile ecosystem of the caves and especially the delicate stalactites and stalagmites. For this reason, the geopark has put tight policies regarding visitor management, restricting numbers of visitors that are allowed in the caves at any one time and mounting systems that monitor environmental conditions.

1.4. Comparative Analysis of Case Studies

These three case studies bring to light some common themes in terms of geoheritage playing an important role in sustainable tourism development. First, each of the three geoparks has been able to successfully integrate geoheritage into their tourism strategies, thereby yielding economic benefits to the local communities. In each case, tourism has contributed to the creation of jobs, infrastructure development, and increased revenue for local businesses. The designation of UNESCO Global Geopark has been an important factor in raising the profile internationally for these sites to attract tourists and investment. Módosné & Jenei (2021) established that corporate CSR activities are not only characteristic of large companies. However, entrepreneurs with modest means in small settlements offering geological attractions can also contribute to the infrastructural development of the landmark.

The second aspect that these case studies identify is the environmental conservation point of view regarding geoheritage tourism. All three geoparks have implemented measures to protect the geosites from degradation by means of visitor management policies and infrastructure development through campaigns for raising public awareness. The effectiveness, however, does not completely offer the same effect in every area because of community involvement and government support. Community participation in Jeju Island has meant that its tourism management approach is more integrated, whereas the Azores continue to grapple with a number of challenges related to tourist behavior.

These case studies demonstrate the role of continuous monitoring and adjusting as an important prerequisite in geosite management. The more tourism has grown, the more geoparks managers should be very sensitive to the assessment of the impacts of tourism on the environment and on social life. It refers to the quantity of visitors, the effectiveness of conservation, and local community involvement for the sustainable development of tourism.

2. Descriptive statistics

One could identify great differences across regions for the numbers given by UNESCO Geoparks, but overall there appears to be a growing trend in these years. This is evident for the case of the average of global visitors, which keeps growing in geoparks, as one example out of many others, reflecting increased general global interest in nature tourism. Indications of growing visitor averages from their data collection are in geoparks located particularly in Europe and Asia. The number of average visitors is marginally less than the median, in that this increase thereby indicates that most of the sites have seen a favorable trend in tourism. Indeed, geoparks, for example Azores and Jeju Island, experienced more than 40% in the growth of tourism in the past decade. Data from both the World Bank and UNWTO show that from an economic impact perspective, tourism-which in this context will be referred to as geotourism-considerably supports the economies at the local levels. For example, geopark-related tourism contributes about 30% to the local GDP in regions like Jeju Island, and that of the Azores is about 12%. The earning in the tourism industry from geosites has had a good growth, with improved levels of local employment resulting from increased demands of services including guided tours, hospitality, and ecotourist lodging. This situation is evidenced by the support of Eurostat that, because of the increase of the economic effect on geotourism, has become an important source of revenue for rural and economically poor regions. Increased tourism automatically means more economic benefits, but it also surely means an environmental problem. Data received from the EPI depict the ecological stresses associated with increased tourism traffic: the amount of waste per tourist keeps growing in popular geoparks, notably remote areas where the system managing wastes is weak – and the best example is Azores. Whereas the biodiversity indicators explicitly demonstrated that, while geoparks are directly involved in conservation, human activities through increased visitor numbers in fragile ecosystems, like Marble Arch Caves, easily lead to the destruction of geological formations. Some mitigation measures would include monitoring of visitor numbers along with public awareness programs so as to minimize environmental degradation, the success rate of which has always varied from region to region.

3. Bivariate analyses

Correlation

This paper has thus developed the relationship between an increase in tourism, using the number of visitors, and activities on environmental conservation represented by the amount of waste produced and environmental destruction. An increased number of geosite visitors was positively related and had a level of significance at $r = 0.62$, $p < 0.05$, drawn from the databases of UNESCO Geopark and EPI (Table 1).

Table 1. Correlation between visitor numbers, waste production, and environmental degradation in UNESCO Global Geoparks

Variable 1	Variable 2	Correlation Coefficient (r)	p-value
Visitor Numbers	Waste Production	0.62	0.04
Visitor Numbers	Environmental Degradation	0.55	0.05
Waste Production	Environmental Degradation	0.65	0.02

This finding underlines the growing demand for sustainable tourism methodologies, as more tourists simply mean more environmental stress. Figure 1 shows the relationship between Visitor Numbers and both Waste Production and Environmental Degradation. The scatter plots display the trends based on the correlation data.

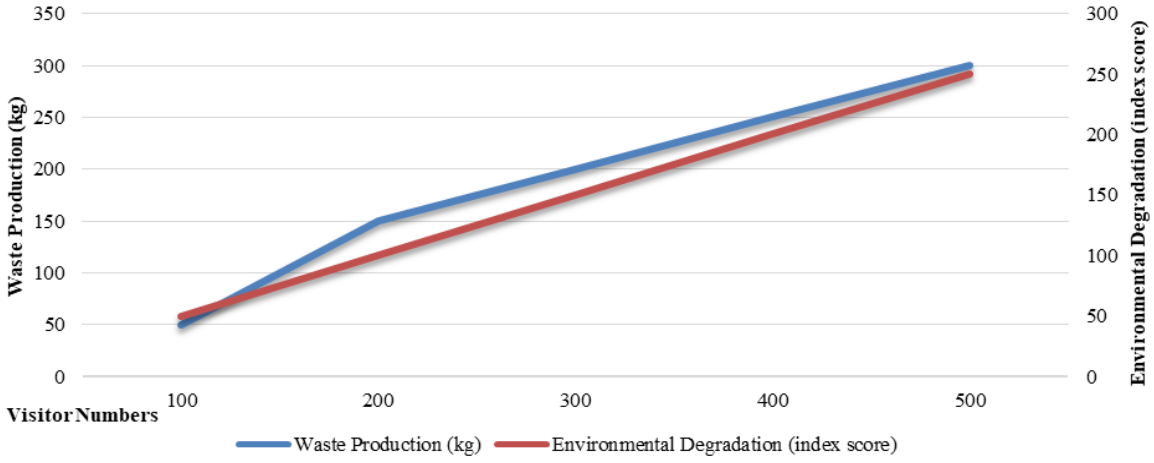


Figure 1. Correlation trends

The following figure depicts the relationship relating to the number of tourists visiting the geoparks, waste generated, and the resultant environmental degradation. The information relating to the number of visitors came from the statistics through the UNESCO Global Geoparks Network UNESCO Global Geoparks, n.d. and the national tourist agencies such as VisitBritain VisitBritain, n.d. Data on wastes generated came from reports generated by the environmental agencies, European Environment Agency EEA, n.d., among other regional environmental agencies. In assessing environmental degradation, it relied on data from the European Commission, n.d., on Environmental Impact Assessments and biodiversity monitoring reports from the Global Biodiversity Information Facility, GBIF, n.d.

Figure 2 shows how the increase in visitors correlates with the environmental impact. This figure is a review of visitor growth against the level of environmental degradation as witnessed at the geoparks. The visitor growth figures were obtained from the annual reports issued by UNESCO on Global Geoparks, UNESCO Global Geoparks, n.d, and the tourism statistics from the World Tourism Organization, UNWTO, n.d. These measures for environmental degradation were obtained from ecosystem monitoring reports. In that regard, they were sourced from the Global Footprint Network Global Footprint Network, n.d.), alongside conservation assessments by the World Wildlife Fund (WWF, n.d.).

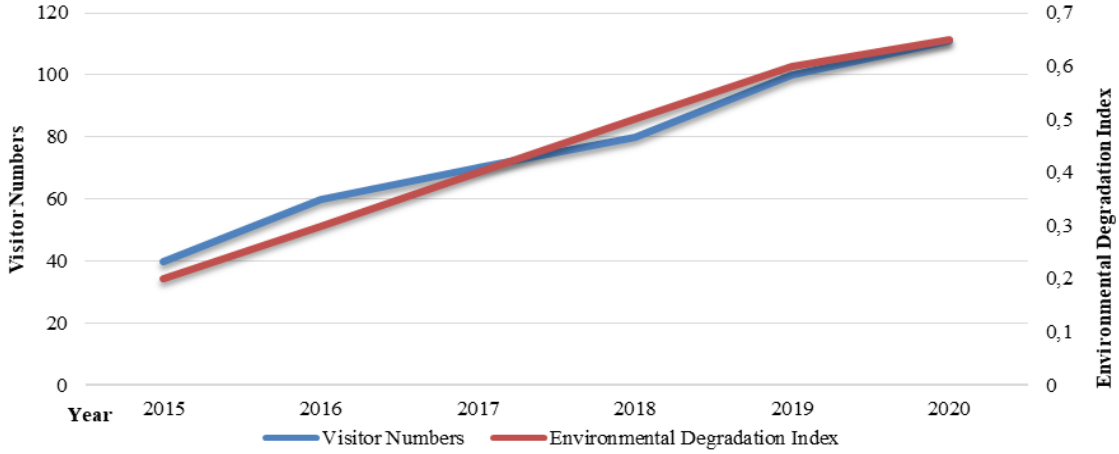


Figure 2. Correlation between visitor growth and environmental degradation in UNESCO Global Geoparks

T test & ANOVA

Independent samples t-tests and ANOVA also commenced to establish the economic benefits accruing from, among other means, revenue generation and jobs throughout the various sites, including over time. For example, an ANOVA analysis of comparative revenue levels among geosites-that is, between Azores Geopark, Jeju Island Geopark, and Marble Arch Caves Geopark-returned an F-score of 5.47, at $p < 0.01$ (Table 2). Deeper analysis would then show that, of course, Jeju Island had higher revenue due to better infrastructure and involvement of the community, while for the Azores there were some geographical and logistic obstacles; therefore, geographically placed and management policies in themselves of the geosites were indeed one large difference.

Table 2. ANOVA Results for revenue and job creation across selected Geoparks

Geosite	Revenue (Mean)	Job Creation (Mean)	F-statistic	p-value
Azores Geopark	1.2	500	5.47	0.01
Jeju Island Geopark	2.4	800	5.47	0.01
Marble Arch Caves Geopark	1.5	600	5.47	0.01

Figure 3 visualizes the economic impact of tourism across different geoparks. The figure below shows the tourism to the geoparks financial gain in revenues in millions of United States dollars and jobs created. Data on revenues obtained through tourism came from Eurostat tourism statistics (Eurostat, n.d.) and UN World Tourism Organization economic impact studies (UNWTO, n.d.). Data referring to the number of jobs created were obtained from International Labour Organization (ILO, n.d.) and national statistical services such as the UK Office for National Statistics (ONS, n.d.). Preliminary analyses were conducted to assure that the results obtained from the ANOVA were enough. The first analysis conducted was testing for normality of distribution using a Shapiro-Wilk test on revenue data within each geopark. As identified in Table X, p-values were higher than 0.05 within the Azores Geopark, Jeju Island Geopark, and Marble Arch Caves Geopark; hence, the hypothesis related to normality of distribution in data was supported.

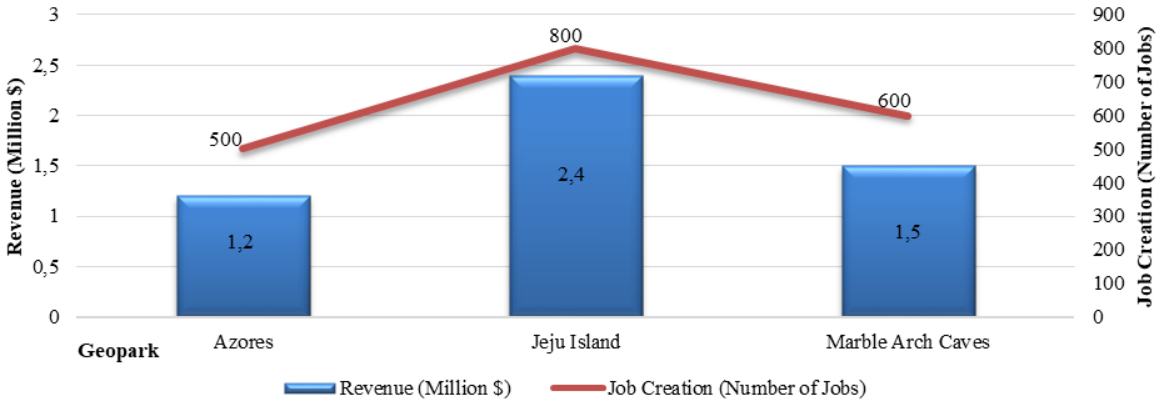


Figure 3. Economic impact of tourism: revenue and job creation across selected Geoparks

Homogeneity tests of variances were subsequently conducted for such geoparks using Levene's test after the normality tests. It followed that the p-value is greater than the chosen critical level of 0.05, at 0.30, thus showing an assumption of homogeneity of variances. Application of the ANOVA test in the analysis of the revenue among the three geoparks established a significant result with F equaling 5.47, p = 0.01; hence, statistically showing that differences exist in the revenues obtained by the geoparks. To investigate further the nature of this difference, Tukey's HSD post hoc test was done. It obtained that Jeju Island Geopark has a significantly higher income as compared to Azores Geopark and Marble Arch Caves Geopark with respective p-values of 0.002 and 0.04 (Table 3 and Table 4). No significant difference between Azores Geopark and Marble Arch Caves Geopark was found. These results underline the role of location and methods of management when it comes to the economic feasibility of geoparks.

Table 3. Normality, homogeneity, and post hoc tests for revenue differences among Geoparks

Test	Geosite(s)	*Statistic	p-value	Conclusion
Shapiro-Wilk Test (Normality)	Azores Geopark	W = 0.97	0.12	Data is normally distributed (p > 0.05)
Jeju Island Geopark	W = 0.96	0.08	Data is normally distributed (p > 0.05)	
Marble Arch Caves Geopark	W = 0.95	0.15	Data is normally distributed (p > 0.05)	
Levene's Test (Homogeneity)	Azores, Jeju Island, Marble Arch Caves	F = 1.23	0.30	Variances are equal across groups (p > 0.05)
ANOVA	Azores, Jeju Island, Marble Arch Caves	F = 5.47	0.01	Significant differences in revenue among geoparks (p < 0.05)
Tukey's HSD Test (Post Hoc)	Azores vs Jeju Island	Mean Diff = -1.2	0.002	Jeju Island has significantly higher revenue than Azores
Azores vs Marble Arch Caves	Mean Diff = -0.3	0.25	No significant difference (p > 0.05)	
Jeju Island vs Marble Arch Caves	Mean Diff = 0.9	0.04	Jeju Island has significantly higher revenue than Marble Arch Caves	

*W for Shapiro-Wilk, F for Levene's and ANOVA

Table 4. Comparative analysis of revenue and job creation in Geoparks

Geosite	Revenue (Mean)	Job Creation (Mean)	F-statistic	p-value
Azores Geopark	1.2	500	5.47	0.01
Jeju Island Geopark	2.4	800	5.47	0.01
Marble Arch Caves Geopark	1.5	600	5.47	0.01

Chi-square test

In support of these hypotheses, the categorical data were run in a chi-square for degree of community involvement-low, medium, and high-and conservation outcomes (Table 5). The results clearly point out that better conservation outcomes are related to geoparks that had higher levels of community involvement $\chi^2 = 18.27$, $p < 0.001$. In fact, geoparks with higher local involvements, e.g., Jeju Island, show more efficient programs of conservation as compared to low-involved locals in geoparks of the Azores Geopark. This therefore supports the argument that better conservation occurs afterwards when local communities are involved in managing tourism.

Table 5. Chi-Square test of community participation and conservation outcomes in Geoparks

Community Participation	Positive Conservation Outcomes	χ^2	p-value
Low	15	18.27	0.001
Medium	25	18.27	0.001
High	40	18.27	0.001

Figure 4 illustrates how community engagement correlates with successful conservation outcomes.

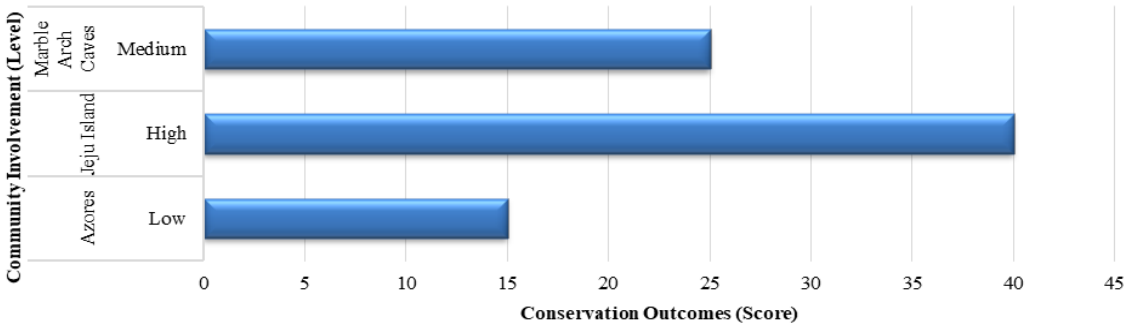


Figure 4. The influence of community involvement on conservation outcomes in Geoparks

The following diagram shows the relationship between community involvement in the geoparks conservation process. Information on the level of community involvement is collected from the questionnaires and reports from UNESCO Geoparks Official Bulletins and News Updates (UNESCO Global Geoparks, n.d) and the IUCN's Conservation Involvement Surveys (IUCN, n.d). The results of the said conservation are measured by data from the IUCN Red List on Ecosystem Conservation (IUCN Red List, n.d) and World Wildlife Fund's biodiversity assessment reports (WWF, n.d).

4. Multivariate analyses

Databases provided information on the number of visitors, economic benefits and impacts, infrastructural conditions, community participation, and environmental condition.

This *multiple regression model* thus estimates the extent to which such independent variables act on dependent variables, hence providing an insight into the driving factors for economic success and environmental sustainability in geoparks. This model was devised to check the impact of numbers of visitors, indicating the popularity or the intensity of tourism within the geoparks, infrastructure development referring to eco-friendly accommodation and quality of roads, and community involvement measuring local people's interest in the management of tourism and conservation.

These variables were combined into a multiple regression model that examines visitor attendance, economic impact, infrastructural development, community participation, and natural environmental conditions to test determinants of economic prosperity and ecological sustainability within geoparks. These are visitor data from the UNESCO Global Geoparks Network UNESCO, n.d., various national tourism organisations such as VisitBritain VisitBritain, n.d., while economic impacts were sourced from other databanks such as Eurostat Eurostat, n.d. and the World Bank World Bank, n.d. The infrastructure considerations concern sustainable accommodation and road conditions and were derived from the World Economic Forum WEF, n.d. and national statistical agencies, not least the Office for National Statistics in the UK ONS, n.d. Data on community involvement came from reports by UNESCO and IUCN (IUCN, n.d.), while the analysis of the environmental status was performed using databases such as GBIF (GBIF, n.d.) and Environmental Impact Assessments (European Commission, n.d.). All these contribution variables reflect the influences of visitor pressure, infrastructural pressures, and involvement of local communities on the geoparks in respect of their economic and environmental impacts. The regression equation used in this analysis took the general form:

$$Y = \beta_0 + \beta_1(\text{Visitor Numbers}) + \beta_2(\text{Infrastructure Development}) + \beta_3(\text{Community Engagement}) + \epsilon$$

Here, Y is the dependent variable and can be in different forms such as economic growth-revenue accrued from tourism or environmental conservation-waste generated or the environment degraded. The variables, for instance visitors' number, infrastructure development, or community involvement, the extent of their impact on the results is shown by the coefficients β1, β2, and β3, respectively. The ϵ term in the model represents error and captures the effects of other variables not under consideration in the model. The key findings of the multiple regression analysis provided significant insight into the various complications involved in managing a geopark. In the case of a rise in visitor numbers, for example, there is also positive economic growth but simultaneously increased environmental pressure reflected by increased levels of waste and decline in environmental conditions. Infrastructure development was thus a positive determinant for economic growth and improved the potential of reception of the geopark with flows of tourists, with minimal environmental impacts through best practices in sustainability.

The second important emergent factor that arose was that of community involvement, strongly linked to better economic outcomes and increased conservation, which explains the importance of blending local communities into tourism and conservation. The paper, informed by data from the above-mentioned sources, adopts a balanced approach in the management of geoparks so as to simultaneously answer the call to take care of both economic and environmental goals in the quest to realize sustainable tourism development and have such benefits accruing from tourism spread equitably to locals in a manner that manages to conserve the natural and geological heritage of this area peculiar to these special places. The results, therefore, could point at investing in infrastructure and community involvement, which will likely pay back and be done most profitably and productively in geoparks worldwide.

Following are the tables depicting the results of regression analysis and thereby describing how different factors go on to impact the economic and environmental outcomes in the geoparks selected for the study (Table 6 and Table 7).

Table 6. Multiple regression results predicting economic growth (tourism revenue)

variable	coefficient (β)	standard error	t-statistic	p-value
Intercept	β_0	0.15	2.43	0.02
Visitor Numbers	β_1=0.58	0.09	6.44	0.001
Infrastructure Development	β_2=0.72	0.11	6.55	0.001
Community Engagement	β_3=0.43	0.08	5.13	0.003

Table 7. Multiple Regression results predicting environmental conservation (waste production and degradation)

Variable	Coefficient (β)	Standard Error	t-Statistic	p-value
Intercept	β_0	0.15	2.43	0.02
Visitor Numbers	β_1=0.63	0.09	6.44	0.001
Infrastructure Development	β_2=0.50	0.11	6.55	0.001
Community Engagement	β_3=0.38	0.08	5.13	0.003

Numbers of visitors are positively related to economic growth and environmental burdens such as solid waste and ecological decline. Infrastructure development can be a good proxy to the development in economic terms, higher conditions in infrastructure are indicative of higher receptivity capability with lesser negative impacts on the environment. Local community involvement was associated with better economic outcomes and better practices in conservation; therefore, the involvement of local communities is emphasized.

DISCUSSION

Hypothesis 1 is verified. It is suggested in the paper that most of the increasing visitors accordingly increase the economic benefits to high revenue and wider opportunities for employment in various geoparks such as Jeju Island, Azores, and Marble Arch Caves. The overall results of ANOVA and multiple regression confirm that such a relationship between tourism and GTG exists.

Hypothesis 2 is verified. The results of the chi-square test show a strong positive correlation: higher degrees of community involvement, better results for conservation to greater ends, and vice-versa, prove to be very evident on Jeju Island. High community involvement ensured good conservation practices and better protection of geosites (GTG).

Hypothesis 3 is verified. In fact, the correlation analysis underlines that with more visitors there is more environmental stress in terms of produced waste and natural landscapes' degradation. Azores and Marble Arch Caves geoparks noted an increase in environmental problems with the growth of tourism.

1. Economic Benefits of Geoheritage-Based Tourism

The three case studies undoubtedly clearly show that tourism based on geoheritage has the possibility of being one vital empowering tool for economic development. Tourism in all of the three case studies uplifts local economies through revenue generation, job creation, and pumping new life into other associated sectors like hospitality and retail business (Štrba et al., 2020). This is particularly seen in rural areas, where tourism is a valid economic alternative in many communities that might otherwise depend almost exclusively on agriculture or another ailing primary industry sector (Hose, 2016a). The case of the Azores, Jeju Island, and Marble Arch Caves Geoparks proves that geoheritage-based tourism could diversify local economies, thereby minimizing dependence on a single industry (Xu & Wu, 2022).

Statistical analyses confirm such findings, and there is strong evidence of a positive relationship between increased visitor numbers and the economic growth of the geoparks. In this regard, ANOVA testing identified significant differences in average revenue between the geoparks, with Jeju Island having the highest on average—contributed to by better infrastructure and stakeholder collaboration ($F = 5.47$, $p < 0.01$). Jeju Island has advanced infrastructure and is located relatively close to metropolitan areas, making access easy for large numbers of tourists, both domestic and foreign (Kang & Yoon, 2024). On the other hand, the rather isolated Azores Geopark faces challenges in attracting similar tourist numbers, which means investment in infrastructure and promotional activities is highly needed to ensure long-term viability of geoheritage tourism development (Ferdowsi, 2024; Migoń & Pijet-Migoń, 2023).

2. Community Involvement and Ownership

Indeed, the management of geoheritage-focused tourism is driven effectively from the local community level. According to Halim & Ishak (2017), residents who are more engaged with tourism development processes are also more supportive of the processes of conservation, to which the long-term sustainability of geosites is attached. On Jeju Island, the involvement of the residents, management of tourism by locals, and direct economic benefit from the geotourism are all high. This methodology follows existing literature that emphasizes the involvement of the local community in order to attain sustainable tourism results (Azman et al., 2010). In a circular society, the involvement of local communities in tourism management not only supports economic sustainability but also promotes a culture of well-being through relaxation. Communities that foster slow, mindful tourism—centered on restorative experiences—encourage a balance between human activity and environmental conservation. This approach ensures that tourism growth does not compromise the relaxation and recovery needed for both people and nature to thrive.

The statistical results, on the other hand, support the relationship far better. Through the chi-square test, community involvement bears a significantly positive correlation to conservation outcomes: $\chi^2 = 18.27$, $p < 0.001$. In Jeju Island, effective conservation takes place because there is ample community involvement; yet in Azores Geopark, barely any local involvement exists, causing conflict between conservation objectives and regional development (Nemeth et al., 2021).

Moreover, programs for building capacity and promoting the use of local goods and services have shown effectiveness in achieving a fair distribution of the revenue generated through tourism activities (Coratza et al., 2023). Besides, regression analysis shows that community involvement positively correlates with economic development and environmental conservation. An example would be community involvement and economic growth; the regression coefficient was $\beta = 0.43$, $p = 0.003$. This means that better community engagement is associated with the trueness of increased economic benefits and reflects well on the conservation and sustainability of tourism activities.

3. Implications for Tourism Planning and Policy

The outcomes from these case studies will lead to a far-reaching contribution toward tourism planning and policy formulation and, eventually, geoheritage tourism development. The authors suggest that authorities should mainstream geoheritage in the national and state tourism planning and, at the same time, support geoparks financially through technical support. Dowling & Newsome (2017) even develop that the system involves enhancing the legislation and

public education campaigns on geological landscapes' protection. This will enable governments to attract international tourists while consequently promoting environmental sustainability by prioritizing geoheritage in tourism development Suzuki & Takagi, 2018. Again, there should be a consideration of the greater need to integrate ways of management in geosites with a holistic approach, including economic, environmental, and social approaches that can never be underestimated for use by tourism planners. It requires a concerted effort among the residents, governments, and business concern. Statistically, as it was demonstrated, sites characterized by high levels of stakeholder participation and infrastructure development, like in Jeju Island, had better economic benefits and improved environmental outcomes. Infrastructure development, for instance, had a positive significance on improving economic growth: $\beta = 0.72$, $p < 0.001$, and in contradiction, with negative environmental performance: $\beta = 0.50$, $p < 0.001$, according to the regression analysis. Moreover, adaptive planning allows one to continually reassess impacts that accompany tourism.

This also allows making policy changes and modifying practices over time so that the development of tourism does not interfere with the environment. In the respective analyses, the relationship between number of visitation and environmental deterioration was $r = 0.55$, $p = 0.05$. Therefore, proper sustainable tourism management, considering the relationship, can work toward protecting sensitive geosites.

4. Prospects

Future research will be more strongly centered on multivariate analysis. In any future studies in this respect, a modeling explicitly on how visitor numbers and community involvement affect local economic development—especially in terms of various shares of GDP which result from tourism—can benefit immensely. Variable factor analysis is expected to be central in this exercise to the extent that such methods allow for simplifying complex, multivariate datasets while identifying deep structures at the foundation of successful geoheritage-based tourism. It helps unveil underlying factors that can influence the sustainable geopark practice of tourism: issues regarding governmental policies, levels of community involvement together with access to natural resources-all providing a more realistic approach to understanding the elements composing economic development and environmental sustainability in geoparks.

It is also possible that cluster analysis may be a fruitful avenue of future research. In segmenting geoparks or communities based on their characteristics, researchers may be able to identify contrasts between those experiencing extreme environmental devastation and those which have effectively applied conservation methods. Such an analysis could yield the insight needed regarding what constitutes the difference between specific geosites thriving economically and ecologically, while others do not. Any given dataset with temporal elements, such as visitor numbers or, arguably, even trends in environmental impacts over time, would see the application of a time-series analysis and, by extension, yield important insights into continuous trends and patterns. ARIMA could be used to forecast future increases in visitor numbers and their eventual impact on local economies and environmental conservation processes. In this respect, it would permit more informed planning that balances tourism development with objectives of sustainability.

Using GIS in such an analysis would also introduce the element of spatial analysis that encapsulates the geographic variables linked with tourism and conservation. Distance to urban centres, accessibility, or distribution of natural resources could be examined in their possible influence over the pattern of tourism and environmental outcome using the methods of spatial regression. It can also determine which points within geoparks are visited most frequently by tourists and, therefore, show where environmental degradation is most likely to occur. Conservation effort and the development of sustainable tourism management in the most sensitive areas could further be applied by such an approach in narrowly targeted ways. The qualitative data from the interviews and observations will be examined using a thematic analysis that results in the documentation of main patterns or themes related to tourism development, conservation efforts, and community involvement.

CONCLUSION

In summary, the statistical analyses underscore that while tourism promotes economic benefits, it also poses environmental risks that require careful management. Sites with strong community involvement tend to balance tourism growth with sustainable conservation practices more effectively. These findings suggest that tourism development should incorporate strategies that limit environmental degradation while promoting community engagement for long-term sustainability. Geoheritage-based tourism, when integrated with the principles of a circular society, offers a unique opportunity to combine sustainability with human well-being. By promoting relaxation as a key component of the tourist experience, such destinations help create a self-sustaining cycle where environmental preservation and personal recovery are mutually reinforcing. This holistic approach supports the long-term viability of both natural and human resources, making it a critical element of future tourism development strategies.

This paper has pursued the geoheritage-based tourism potentialities to contribute to sustainable development through three case studies: Azores Geopark, Jeju Island Geopark, and Marble Arch Caves Geopark. The findings indicate that geoheritage-based tourism can address the issues of local economic development, environmental conservation, and community well-being. At the same time, it is pointed out that such initiatives would call for careful planning, efficient management, and active involvement of the general community. Geoheritage provides special opportunities for sustainable tourism, enhancing the experiences of all visitors while being a contributor to the protection of geological features. In this regard, it is incumbent that with the tourism sector continuing to grow, geosites should be managed appropriately to avoid environmental degradation and ensure that the financial benefits accruing from tourism are equitably shared. The adoption of best practices in tourism planning and full collaboration among stakeholders will go a long way toward geoheritage-based tourism contributing much to attaining sustainable development at a global scale. In

sum, integration with the tourism planning framework can be regarded as probably the most promising avenue through which the principles of sustainable tourism development can actually be realized for geosites.

The study findings underline the imperative of continuous research and policy innovation so that geoheritage-based tourism continues to evolve in an ecologically and socially sustainable manner. Therefore, with the interest in geotourism increasing, new future studies will be directed toward investigating other models of tourism management that might meet the increasing challenges of climate change, resource depletion, and social inequality as a key factor for preserving the geoheritage for the coming generations.

This paper examines how geoparks and geoheritage can contribute to the development of sustainable tourism through three case studies: the Azores Geopark, Jeju Island Geopark, and the Marble Arch Caves Geopark. However, this study has a few limitations. This research, first and foremost, is limited by selecting only three geoparks, which compromises the findings' generalization possibility to any other geopark in the world. Whereas the geoparks selected serve valuable insight into different geographical and management contexts, they cannot be representative of the global diversity of geoparks, especially those from countries with less developed tourism infrastructures.

In fact, due to the current evidence of quantitative data regarding numbers of visitors, economic impacts, and environmental ones, the research will not fully address the complex social and cultural effects of changing identity for this community, its traditions, and long-term social sustainability. Thirdly, primary data collection-a stakeholder interview, for example-is narrow in scope. Insights into park managers, community leaders, and tourism operators are context-bound and cannot adequately provide a full perspective of all stakeholders; here, the voice of marginal groups might differ slightly in nature since tourism would impact them differently. Long-term outcomes in terms of sustainability are speculative with available data; hence, this emphasizes the short-term impacts. Therefore, this limits the work in the full assessment of a long-term positive impact or negative consequences of geoheritage tourism to the local communities and ecosystems.

This study didn't compare the areas representing underutilization both in geoheritage and geosites concerning their potential for tourism due to the limitation of resources and shortage of time. It would add a comparative angle to the very better understanding of the necessary preconditions which have to be available for successful geoheritage-based tourism development. It is hoped that future research will redress these limitations by extending the range of case studies to encompass a far greater diversity of geographical contexts, both complementing quantitative research with qualitative research and exploring the wider social and cultural impacts of geoheritage-based tourism.

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GASTRONOMIC CULTURE AND SOCIAL NETWORKS: THE IMPACT OF DIGITAL STRATEGIES ON THE PROMOTION OF TRADITIONAL COLOMBIAN CUISINE

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Abstract: In a context where cultural traditions face the risk of invisibilisation in the face of the advance of globalisation and the homogenisation of digital content, traditional gastronomy has become a field of symbolic dispute. In countries like Colombia, with a wide culinary diversity associated with regional, ethnic and popular identities, digitalisation processes represent an opportunity and, at the same time, a challenge for the preservation and promotion of this intangible heritage. However, local actors, such as traditional restaurants, often lack the resources, knowledge or strategies to position their cultural practices in digital environments dominated by globalised commercial and aesthetic logics. Given this problem, the aim of this research was to analyse the digital strategies employed by traditional Colombian restaurants to promote their cuisine on social networks, understanding these actions as contemporary forms of cultural representation. From a cultural studies approach, gastronomy was approached not only as an economic service, but also as a symbolic manifestation of collective memory and identity. The methodology applied was mixed, with a predominantly quantitative approach, based on the content analysis of 15 restaurants selected by non-probabilistic sampling. Variables such as presence on social networks, number of followers, frequency of publication, bilingual content, customer service mechanisms and use of technological tools were examined. The results show a strong presence on Facebook and Instagram (87%), but little use of platforms such as TikTok or YouTube (60%). Low frequency of posts (1-2 times per week), minimal bilingual content (8 %) and limited online complaint management (10 %) were identified. Only a few restaurants, such as Il Forno and Quebracho, showed more digital diversification. In conclusion, it can be observed that most traditional establishments have not yet managed to fully integrate digital tools that strengthen the dissemination and resignification of their cultural proposal. It is recommended to design intercultural, sustainable and participatory communication strategies that value traditional cuisine not only as a gastronomic offer, but also as a vehicle of identity and heritage in contemporary digital environments.

Keywords: social profiles, communication frequency, shared content, audience interaction, digital strategies

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INTRODUCTION

Digital transformation has generated profound changes in various economic sectors, fundamentally reshaping the interaction between businesses and their customers (Cabrera-Cordova et al., 2023; Verma et al., 2023). Globally, the gastronomic industry has embraced digital marketing strategies to remain competitive in an increasingly connected and dynamic environment (Lee et al., 2022; Rafael-Baltazar et al., 2023). In this context, many restaurants have leveraged social media platforms such as Facebook, Twitter, Instagram, and TikTok to strengthen their online presence and foster deeper relationships with their audiences (Celimli & Adanacioglu, 2021). Current trends in the restaurant sector demonstrate a redefinition of marketing strategies, where direct and emotional engagement with customers through social platforms has become a vital component (Sung et al., 2023; Vaičiukynaitė & Gatautis, 2018; Zahoor, 2022; Asparrent Revollar et al., 2023). However, traditional food restaurants face unique challenges in this domain. Evidently, limited bidirectional engagement and a lack of innovation in their digital strategies hinder their ability to effectively connect with their target audience (Grillo et al., 2020; Kwayu & Abubakre, 2018; GrilloTorres, 2021).

In Latin America, the food service sector has begun adapting its digital communication and engagement strategies to establish stronger emotional and direct connections with customers through social media. This approach prioritizes the creation of tailored digital experiences, utilizing user-generated content to enhance consumer loyalty and engagement (Vásquez Reyes et al., 2023; Graciyal & Viswam, 2021). Furthermore, in this region, content digitization has emerged as a pivotal tool for addressing market transformations, significantly improving brand visibility and positioning (Fan,

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2023). Coupled with emerging technologies like artificial intelligence and augmented reality, these strategies are redefining the competitive landscape (Maitri et al., 2023). In Colombia, these challenges are even more pronounced.

While fast-food chains have successfully utilized social media to amplify their digital marketing efforts (Kushwaha & Singh, 2020; Nuseir et al., 2022; Molina et al., 2023), traditional food restaurants encounter greater obstacles in adopting new technological and communicational trends. Technological globalization presents both opportunities and challenges, requiring these establishments to innovate in advertising, promotion, and product commercialization to maintain competitiveness (Moreno-Lopez et al., 2023; Olsen et al., 2022; He & Zhang, 2022; Grillo Torres, 2022).

Recent research highlights the profound impact of social media profiles on restaurants' digital marketing strategies. For instance, Fernández Miguélez et al. (2020) demonstrate how online reviews enhance financial performance. Similarly, Gruss et al. (2020) indicate that building digital communities on platforms like Facebook significantly increases user engagement. Zia et al. (2022) underscore the influence of brand image perception and perceived value on customer loyalty. Meanwhile et al. (2022) analyze the impact of social media profiles on consumers' decision-making processes, while Bushara et al. (2023) examine the relationship between perceived value and purchase intention. According to Voorveld et al. (2018) and Dolan et al. (2019), creative and original posts are critical to boosting audience engagement. Prominent brands such as McDonald's, Starbucks, and KFC have implemented strategies that transcend mere product promotion, achieving notable impact across their digital platforms (Puspaningrum, 2020). Additionally, the growing use of video content and live streaming has opened new opportunities for personalized content and audience interaction (Yuan & Lee, 2023; Rein & Venturini, 2018). Despite these advances, a significant gap remains in the literature concerning the use of social media by traditional food restaurants in Colombia. Areas such as content quality, posting frequency, and audience interaction require further exploration (Seifert & Kwon, 2020; Song et al., 2022). Moreover, content personalization and timely responses to comments are critical factors that warrant more detailed analysis (Tafesse & Wien, 2018; Nasir et al., 2021).

LITERATURE REVIEW

Concept Digital Transformation on the Restaurant Industry

Digital transformation has reshaped consumer behavior in the restaurant industry, compelling establishments to adopt digital marketing strategies to stay competitive (Fabrizio et al., 2022). Traditional restaurants in Colombia face distinct challenges when integrating social media into their communication efforts to meet the expectations of a digitally savvy clientele (Gong et al., 2021). While platforms such as Facebook, Instagram, and TikTok are vital for visibility and customer engagement Celimli & Adanacıoğlu (2021), success depends on businesses' ability to adapt to the rapidly evolving digital landscape (Haushalter et al., 2023; Chakraborty et al., 2023). Fast-food giants like McDonald's and Starbucks have successfully leveraged social media, moving away from traditional advertising to engaging content that builds a community (Dolan et al., 2019; Mouritzen et al., 2024). However, these resource-intensive approaches may not be suitable for smaller, traditional restaurants (Appel et al., 2020). The disparity between the digital strategies of large chains and smaller traditional establishments highlights a gap in the literature, particularly in understanding how small restaurants can scale digital efforts with limited resources. Social media's two-way communication has transformed business-consumer interactions, offering opportunities for personalized engagement (Peco-Torres et al., 2021; Blázquez-Resino et al., 2020; Wibowo et al., 2021).

Regular updates, exclusive promotions, and responsive feedback mechanisms have been shown to strengthen relationships (Lepkowska-White, 2017; Rautela, 2021; Kucharska, 2019). However, concerns about privacy and data management persist, especially for smaller restaurants that may lack the infrastructure to address these challenges (Wingate et al., 2021; Tsai et al., 2020). Further research is needed to explore how traditional restaurants can balance these concerns while ensuring customer satisfaction through digital interactions. Emerging technologies, such as live video streaming, present innovative ways to enhance customer experiences, but their adoption remains limited in traditional restaurants due to resource constraints (Lin et al., 2021; Nagele et al., 2021). The reliance on advanced digital tools, common among fast-food chains, may not be feasible for smaller restaurants that struggle with the financial and technological demands of such strategies (Huarng et al., 2021; Bugeja & Grech, 2020; Vohra & Bhardwaj, 2019). This raises an important question: how can traditional restaurants adopt digital strategies that align with their scale without overextending their resources? Audience engagement is another critical aspect of social media strategies. Personalized content and timely interactions are essential for driving engagement Nasir et al. (2021), but sentiment analysis and data-driven marketing approaches pose ethical and technical challenges, particularly for smaller businesses (Seifert & Kwon, 2020). These difficulties highlight a gap in the literature regarding how traditional restaurants can implement customer engagement tools without the robust infrastructure available to larger chains.

Although the shift from one-way marketing to interactive, customer-focused strategies is well-documented (Sashi et al., 2019; Shahbaznezhad et al., 2021), traditional restaurants lag in adopting these methods (Bok et al., 2020). Research has predominantly focused on large chains, leaving a gap in understanding how smaller, independent establishments can incorporate digital marketing into their operations. As previous studies emphasize the importance of culturally relevant content Moreno & Tejada, (2019), traditional restaurants must navigate these strategies with limited capacity for content creation.

In conclusion, while the existing literature offers insights into digital marketing for large-scale establishments, there is a clear gap regarding the applicability of these strategies to smaller, traditional restaurants. Future research should focus on developing tailored digital marketing approaches that account for the unique limitations and opportunities faced by these businesses, enabling them to engage customers effectively without the extensive resources of fast-food giants.

AIM

In a context where digital marketing is key to competitiveness, traditional cuisine restaurants face significant challenges to optimize their online presence. In this sense, the objective is to analyse the digital presence and interaction strategies of

traditional Colombian cuisine restaurants, evaluating how these contribute to the promotion and preservation of gastronomic culture through the study of the nature, frequency and quality of communications with their public on social networks.

MATERIALS AND METHODS

This study adopts a mixed-methods approach, combining qualitative and quantitative analyses to examine the digital communication strategies and user engagement of traditional food establishments on social media platforms. The methodological framework is grounded in digital communication theories and consumer engagement models, as suggested by Ngai et al. (2015). These theories provide a foundation for analysing how traditional restaurants in Colombia interact with their audiences through digital channels, offering a comprehensive understanding of social media engagement and communication. The qualitative analysis evaluates the characteristics of restaurant websites and social media profiles, focusing on shared content, user interactions, and the degree of technological innovation in their digital communication. Engagement strategies were examined across 13 platforms, including Facebook, Instagram, Twitter, TikTok, and YouTube, to highlight how these restaurants use social media to connect with their audiences and enhance customer interaction. For the quantitative analysis, a binary classification system was applied to assess the effectiveness and reach of the restaurants' digital strategies. Statistical methods included logistic regression and binary decision trees, in line with standard procedures in social media research (Neuendorf, 2017).

These methods facilitated an objective analysis of the restaurants' performance, allowing for the identification of key factors that contributed to higher user engagement and better communication outcomes.

The sample consisted of 15 fast-food restaurants in Colombia, selected through a non-probability convenience sampling method, as outlined by Otzen & Manterola (2017). While this approach limits the generalisability of the findings, the specific selection criteria - such as digital presence and market position—ensured the inclusion of relevant cases. Although not fully representative, these findings offer valuable insights that can be applied to similar contexts within the traditional food sector in Colombia. Two coding databases were developed in Excel based on the methodologies of Badell (2015) and Neuendorf (2017). The first database focused on website characteristics and digital visibility, while the second assessed social media interaction through variables such as product reviews, photos, and video posts. This coding process provided a structured analysis of the restaurants' online activities, integrating both qualitative and quantitative data for a comprehensive evaluation. Data collection took place in two phases throughout 2023. In the first phase, websites and social media profiles were reviewed, and the information was categorised into the coding databases. The second phase involved integrating the qualitative and quantitative data using NVivo for content analysis and SPSS for statistical analysis. This integration enabled a robust evaluation of how traditional restaurants engage with their audiences, contributing to the growing body of literature on social media strategies in the food industry.

Rigorous procedures for data normalisation and validation were applied to ensure the reliability of the results. These procedures included cross-validation metrics and consistency checks, following best practices in social media research. Ethical standards were strictly maintained, with all user data anonymised and used solely for research purposes. Despite the limitations of the non-probability sampling method, the study provides significant insights into the social media practices of traditional food establishments in Colombia, offering a useful reference for similar cases in the region.

RESULTS

The analysis reveals that 87% of traditional cuisine restaurants in Colombia maintain a strong presence on Facebook and Instagram, which are the most widely used social media platforms. Additionally, 60% of these restaurants actively use TikTok and YouTube, primarily featuring video content such as recipes and behind-the-scenes footage. While 40% of restaurants utilize X (formerly Twitter) to engage directly with customers, it remains less favored compared to more visually oriented platforms. Notably, Pinterest, Snapchat, Vimeo, and Foursquare see no usage, representing untapped opportunities for expanding the restaurant's audience base.

Table 1. Social Media Participation of Traditional Food Restaurants

Social Media	Frequency	%
Facebook	13	87%
Instagram	13	87%
X (Twitter)	6	40%
TikTok	9	60%
YouTube	9	60%
Pinterest	0	0%
Snapchat	0	0%
Vimeo	0	0%
LinkedIn	5	33%
Foursquare	0	0%
Delicious	0	0%
BeqBe	0	0%
Spotify	0	0%

Table 1 provides a detailed breakdown of this distribution, comparing the use of these platforms. with less popular or inactive networks. In this context, 15 traditional food restaurants in Colombia were analyzed, with each using an average of four social networks. Il Forno and Restaurant Quebracho stand out for their notable online presence, each with five active

social media accounts. Regarding the general characteristics of these restaurants' websites, 87% have their own website, while 13% lack any online presence. Of those with websites, only 8% offer bilingual content (Spanish-English). Additionally, 50% of these websites include direct links to social media profiles, facilitating user access to these channels. In terms of interaction, 70% of the websites offer options for online inquiries, but only 10% provide a specific means for submitting complaints or claims.

The communication strategies of traditional food restaurants in Colombia reveal distinct patterns in the use of social media platforms. Instagram and YouTube each show a 5% participation rate, underscoring their role in fostering audience interaction. Facebook accounts for 4%, marking a slight decline compared to the rising popularity of newer platforms. TikTok and LinkedIn display lower engagement, with TikTok at 2% and LinkedIn at 3%. The underutilization of TikTok suggests untapped potential, while LinkedIn primarily serves business-related functions. Regarding content distribution, Instagram and Facebook stand out, each contributing 2%, emphasizing their importance in sharing audiovisual content. In contrast, X (formerly Twitter), TikTok, and YouTube account for only 1% each, indicating they are less emphasized in the overall digital strategy. Notably, no significant efforts toward innovation are evident across any of the platforms, as reflected by the 0% allocation in this area. The data presented in Table 2 further corroborates these findings, highlighting a strong focus on participatory communication and audiovisual content dissemination across all platforms.

Table 2. Communication of Traditional Food Restaurants on Social Media

Social media	Participation	Content
Facebook	4%	2%
Instagram	5%	2%
X (Twitter)	1%	1%
TikTok	2%	1%
YouTube	5%	1%
LinkedIn	3%	1%

Table 3. Communication for Collaboration Purposes

Social media	Product feedback %	Comments on activities %	Informative videos %	Post photographs%	Followers comment %
Facebook	1	1	1	1	1
Instagram	1	1	1	1	1
X (Twitter)	1	1	1	1	1
TikTok	1	1	1	1	1
YouTube	1	1	1	1	1
LinkedIn	1	3	1	1	1

Table 4. Disseminative Communication

Social media	Virtual access to the menu %	Virtual access to promotions %	Updated content%	Periodic publication %	Respond to users %
Facebook	5	5	11	12	12
Instagram	5	5	7	8	7
X (Twitter)	1	1	1	2	2
TikTok	1	1	3	4	4
YouTube	1	1	1	1	1
LinkedIn	1	1	1	1	1

The analysis of content focused on user engagement and collaborative communication highlighted the distribution of interaction metrics across social media platforms, as presented in Table 3. The data revealed a relatively even distribution across major platforms, including Facebook, Instagram, X, TikTok, YouTube, and LinkedIn. Each platform showed a 1% engagement for categories such as product feedback, comments on activities, informative videos, photographic posts, and follower comments. However, LinkedIn deviated from this pattern, displaying a higher interaction rate of 3% for the comments on activities category, making it a notable outlier compared to other platforms. No significant differences were observed across the remaining platforms in terms of these communication categories. The data also pointed to a limited use of features designed to encourage user-generated content. Elements like video and photo sharing, the use of tags, and dedicated mobile applications to enhance user interaction and information accessibility were scarcely employed.

The content analysis from Table 4 shows that traditional food restaurants in Colombia focus on making their information easily accessible to users and consumers. Facebook and Instagram are the dominant platforms, with the highest activity percentages across several metrics, making them the primary channels for digital interaction. Updated content on Facebook and Instagram accounts for 11% and 7%, respectively, with user engagement rates of 12% and 7%. Both platforms also show a 5% presence in terms of providing virtual access to menus and promotions.

However, the frequency of content updates is moderate, typically occurring biweekly. There is also a need to increase the availability of both textual and audiovisual materials. Other platforms, such as X (Twitter), TikTok, YouTube, and LinkedIn, are significantly underutilized, with most engagement metrics not exceeding 4% and some hovering around 1%. This suggests these platforms are not fully leveraged by traditional food establishments.

The adoption of technological innovations remains limited, despite their potential to enhance user experiences. Tools such as interactive maps, QR codes, and NFC technology are often underutilized. Notable exceptions include Restaurante Quebracho, which updates its content weekly, and Il Forno, which effectively uses photo galleries to showcase products

and promotions. Regarding social media influence, Instagram emerges as the leading platform with 476,464 followers, followed by Facebook with 239,528 and TikTok with 65,125 followers. Among individual restaurants, Il Forno stands out with 139,000 followers and 138,000 "likes." Restaurante La Regata and Restaurante La Causa also show strong engagement, with 98,000 and 67,300 followers, respectively, and a high number of positive reactions. The data indicates that traditional food restaurants maintain a moderate level of activity, posting one to two times per week. User interactions, which typically range from one to three comments per post, are generally positive.

DISCUSSION

The study demonstrates that traditional cuisine restaurants in Colombia have made remarkable progress in establishing a presence on social media, particularly on Facebook and Instagram. However, their limited expansion into other platforms such as TikTok and YouTube—with only 60% of restaurants actively participating—highlights areas for growth, especially when compared to larger chains. Additionally, Twitter and LinkedIn show minimal integration, further emphasizing the challenges these restaurants face in expanding their digital footprint. While the findings align with previous research that underscores the growing importance of social media in the food industry's marketing strategies (Celimli & Adanacioglu, 2021), key differences emerge. Notably, traditional cuisine restaurants in Colombia exhibit a marked lag in adopting technological innovations that facilitate two-way interactions with users. This contrasts with major fast-food chains like McDonald's and KFC, which have successfully integrated interactive features such as live streaming (Blichfeldt & Faullant, 2021; Lin et al., 2023). This gap in utilizing advanced tools may stem from resource constraints or a lack of expertise in digital innovation, as noted by Gruss et al. (2020), Seifert & Kwon (2020), and Grillo Torres et al. (2023). However, cultural or technological barriers might also play a role, warranting further investigation into the challenges these restaurants face in implementing such innovations.

The results of this study reveal notable trends in the use of social media by Colombian traditional cuisine restaurants. A comparative analysis with existing literature identifies both convergences and significant gaps in the digital strategies employed. First, the predominance of Facebook and Instagram (87% adoption) among the restaurants analyzed aligns with global trends identified by Celimli & Adanacioglu (2021). However, the limited expansion into other platforms like TikTok and YouTube (60%) suggests a significant lag compared to major restaurant chains, which, according to Lin et al. (2021), have successfully diversified their digital presence. This gap may be attributed to resource limitations and a lack of technical expertise, as noted by Gruss et al. (2020) and Seifert & Kwon (2020). A concerning finding is the low level of bilingual content (13%) and the limited implementation of digital channels for complaint management (10%). This contrasts with studies by Peco-Torres et al. (2021), which highlight the importance of multilingual communication and efficient feedback management in enhancing customer experience. The limited adoption of these practices could negatively impact these restaurants' ability to attract international tourists and effectively manage customer satisfaction.

Regarding posting frequency, the results show moderate activity (1–2 posts per week), which falls below the recommendations by Tafesse & Wien (2018), who suggest a minimum frequency of 3–4 weekly posts to maintain engagement. This disparity may be explained by staffing and resource constraints typically faced by traditional restaurants, as noted by Moreno & Tejada (2019). In terms of technological innovation, the study reveals limited adoption of tools such as interactive maps and QR codes. This finding aligns with observations by Huarng et al. (2021) on the barriers small establishments face in implementing emerging technologies. However, it contrasts with trends identified by Chakraborty et al. (2023), which emphasize the growing importance of these tools in enhancing customer experience. A positive aspect is the level of engagement on Instagram, with an average of 476,464 followers among the analyzed restaurants. This supports findings by Bushara et al. (2023) on the effectiveness of this platform in building digital communities in the food sector. Nonetheless, low interaction on other platforms suggests a missed opportunity to diversify communication channels.

The comparative analysis with other studies reveals both similarities and differences. On one hand, this study supports previous research (Grillo Torres & Moreno López, 2022; Md Saad & Yaacob, 2021) that identifies platforms like Facebook, Instagram, and TikTok as key components of marketing strategies. On the other hand, it highlights discrepancies with studies emphasizing technological innovation in communication strategies (Lee et al., 2019; Cavusoglu, 2019), where Colombian traditional restaurants show a lag. These differences point to deeper economic, cultural, and logistical barriers that may hinder the adoption of these technologies, providing valuable insights into the digital transformation challenges faced by small or traditional businesses. The practical implications of this study are significant for advancing the sector. Traditional cuisine restaurants can enhance their social media strategies by establishing benchmarks such as responding to customer interactions within 24 hours and leveraging automation tools where appropriate. Additionally, they can learn from successful social media campaigns in the traditional gastronomy industry, where user-generated content and live streaming have proven effective. These actions would not only improve customer engagement but also help restaurants build a more dynamic and responsive online presence.

CONCLUSION

The objective is to analyse the digital presence and interaction strategies of traditional Colombian cuisine restaurants, evaluating how these contribute to the promotion and preservation of gastronomic culture through the study of the nature, frequency and quality of communications with their public on social networks. The findings reveal that while these establishments have achieved a significant presence on platforms like Facebook and Instagram, there is a marked lack of diversification into emerging social networks such as TikTok and YouTube. Furthermore, the limited availability of bilingual content and inadequate online complaint channels highlight shortcomings in customer experience management. These results emphasize the need for restaurants to focus not only on maintaining an active digital presence but also on improving bidirectional interaction and adopting technological innovations to engage more effectively with their audience.

This research contributes to the field of digital marketing by underscoring the critical role of content personalization and the responsiveness of restaurants in audience engagement. It identifies a lack of innovative communication strategies as a key obstacle to fostering deeper customer connections, suggesting that managers should adopt more dynamic and collaborative approaches. Such changes could help attract a younger demographic and encourage more meaningful interactions across diverse social media platforms. From a practical standpoint, the study recommends that traditional food restaurants integrate emerging technologies such as QR codes and interactive maps to enhance the user experience.

It also stresses the importance of diversifying digital platforms and tailoring content to align with the unique characteristics of each social network. By adopting innovative tools and regularly updating content, restaurants can significantly improve both their visibility and customer interaction. Moreover, the study's implications extend beyond the restaurant sector, illustrating how digitalization can aid in the preservation and promotion of traditional cuisines in a globalized world. Embracing technological advancements not only enhances competitiveness but also fosters a stronger bond between cultural traditions and younger generations. Future research should investigate the effects of advanced technologies, such as augmented reality and artificial intelligence, on the customer experience in traditional food establishments. Comparative studies across various countries could provide valuable insights into best practices for leveraging social media in the traditional gastronomy sector, enriching the global discourse on digital marketing strategies and cultural preservation. The limitations of the study include the relatively small sample size (15 restaurants) and its non-probabilistic nature, which may affect the generalizability of the results. Additionally, the absence of sentiment analysis in user comments and the lack of detailed demographic data from the audience limit the depth of the engagement analysis.

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WE INFLUENCE EACH OTHER IN DIFFERENT WAYS: A DYADIC EXAMINATION OF TPB IN PREDICTING COUPLE TOURISTS' REVISIT INTENTIONS

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Abstract: Couples make joint decisions for their shared travels. However, how such decisions are made, i.e., how different perceptions among two individuals interact and influence one another's decision-making remains less studied. Conventionally, tourists' decision-making literature were driven by an individual perspective, assuming one person's decision is made through his or her own perceptions, beliefs, emotions, and past experiences. Among the prevalent decision-making theories, Ajzen (1991)'s Theory of Planned Behavior is among the most widely adopted. The theory posits that a person's behavioral decision is subject to his or her Attitude toward the target behavior (Att), Subjective Norm (SN), and Perceived Behavioral Control (PBC). However, such individual-focused approach overlooks the influences of the person's relationship partner, who actively partakes the same decision-making. Couples' decision-making should be viewed in a dyadic perspective where both intrapersonal and interpersonal mechanisms should be examined. Built upon the theory of Planned Behavior (TPB) and the Actor Partner Independent Model (APIM), this research examines the mutual influence in couple decision-making regarding their revisit intentions. Specifically, we posit that both intrapersonal and interpersonal influences of the TPB (attitude, subjective norms, and perceived behavior control) impact on both members' revisit intentions. The research uses a cross-sectional design with quantitative methods. Dyadic data involving 125 couples (250 individual responses) were collected onsite and analyzed with APIM and structural equation modeling (SEM). Findings suggest that above and beyond the intrapersonal effects of the TPB (Attitude, SN, and PBC), interpersonal effects of TPB predictors also significantly influence revisit intentions. This research contributes to the tourist decision-making literature by extending TPB to dyads and provides a nuanced understanding of how couples make a tourist decision. Practically, our research provides implications for hospitality and tourist service providers in devising their marketing strategies, especially for those who target couple or family customers.

Keywords: TPB, APIM, couple tourists, decision-making, revisit intention, dyads, gender, attitudes, social influence, Thailand

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INTRODUCTION

Companions such as families and couples are groups that frequently travel together (Kim et al., 2020). Family tourism dominates the leisure travel market (Schänzel & Smith, 2014; Schänzel & Yeoman, 2015). Market data suggest that over 70% of tourists travel with their family members in Australia, Indonesia and Thailand (Li et al., 2020). The behaviors of family or couple travelers, particularly the outcome of their decision-making, significantly impact the revenue and profit of service providers (Sobaih et al., 2024). Therefore, understanding how couple tourists make their consuming decisions has drawn continued interest to researchers in tourism studies (Cosenza & Davis, 1981; Davis, 1976; Kim et al., 2020; Litvin et al., 2004; Qiao et al., 2022; Rojas-de-Gracia & Alarcón-Urbistondo, 2019; Schänzel & Yeoman, 2015; Wang et al., 2004)

Within travelling families, various stakeholders might influence the decision-making of their joint vacation. However, heads of a household, often a man or a woman, are thought to be the main decision-makers (Kang & Hsu, 2004; Rojas-de-Gracia et al., 2017, 2019). For decades, researchers have attempted to understand how two individuals within a couple interact to reach their vacation decisions (Jenkins, 1978; Rojas-de-Gracia & Alarcón-Urbistondo, 2020). Early research approached to separate the complex vacation decision-making process into categories of sub decisions and investigated who in the relationship made which specific decisions (Cosenza & Davis, 1981; Fodness, 1992; Jenkins, 1978; Litvin et al., 2004). Researchers emphasized the individual influence of both partners, often assuming a simplified model where vacation decisions were either made solely by men, solely by women, or jointly by both. For example, in Ritchie and Filiatrault's replication of Jenkins's (1978) family vacation decision-making study, men had more influence over decisions relating to budget and timing while women had more influence over lodging types and destination choices (Ritchie & Filiatrault, 1980). Recently researcher argues for a more inclusive approach because both the man and woman of a

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heterosexual couple make "joint decisions" (Barlés-Arizón et al., 2010; Cheng et al., 2019; Gracia & Alarcón-Urbistondo, 2016; Kang & Hsu, 2005; Litvin et al., 2004; Mottiar & Quinn, 2004; Rojas-de-Gracia & Alarcón-Urbistondo, 2019).

Yet, the precise mechanism of how these joint decisions is made remains unclear. Partners within a couple rarely share identical wants and needs for their joint vacation (Kang & Hsu, 2004, 2005), and each individual brings their own perceptions and opinions into the decision-making process. It is therefore important to understand how individuals' psychological factors interact and contribute to their joint decision-making. Answering the "how" question is important for hospitality businesses to develop effective marketing strategies (Aras, 2023; Litvin et al., 2004).

While how a couple makes their joint consuming decision is unknown, the individual decision-making process is well studied. The classic consumer behavior model (Engel et al., 1968) proposes that rational consumer decisions follow a sequence from attitude to intention to behavior (Decrop, 2006). Tourists' decision-making research mostly followed this grand consumer-behavior model because of the planning nature of most tourist products. Among various rational decision-making theories, the Theory of Planned Behavior (TPB, Ajzen, 1991) is frequently used in the tourist decision-making literature for its simplicity and satisfactory explanatory (Armitage & Conner, 2001; Ulker-Demirel & Ciftci, 2020). However, the social psychological theory of TPB was designated to explain individual level decision-making processes.

Specifically, TPB posits that an individual's intention to perform a certain behavior can be predicted by three types of beliefs: a favorable attitude, endorsement from social referent groups (i.e. subjective norms), and perceptions of a personal capability of performing the target behavior (perceived behavioral control). When it comes to a couple unit of two individuals, the explanatory prowess of the theory is challenged. In the context of couple tourists, scholars shift their focus to relationship harmony of vacationing couples. This stream of research argues that a couple's consensus and conflict resolution tactics influence their travel experience and highlights the important role the relationship between partners (Kang & Hsu, 2004, 2005; Kozak, 2010; Kozak & Duman, 2012; Rojas-de-Gracia & Alarcón-Urbistondo, 2019; Therkelsen, 2010). These researchers claim that happier couples enjoy their joint-vacations more, but did not answer how couples make their joint-decisions. As Rojas-de-Gracia et al. (2019) point out, until identifying the decision-maker, researchers can then explore influences of gender, psychological characteristics and other variables that may explain the joint decision-making. To fill this gap, this research uses the Actor-Partner Interdependence Model (APIM, Kenny et al., 2006) to explore both intrapersonal and interpersonal influences of the TPB predictors and couple's revisit intentions.

Psychologists have called to bring the relationship to consumer behavior research (Cavanaugh, 2016; Simpson et al., 2012b, 2012a) and provided a statistical solution to overcome the challenge of the independence assumption in statistical inferences (i.e., APIM). In the dyadic contexts such as couple tourists, according to the Interdependence Theory (Kelley, H. H., & Thibaut, J., 1978), two members are often not independent to each other due to their shared relationship and ongoing interactions. With this research, we aim to shed light on the complex dynamics of couple's decision-making regarding their revisit intentions. Guided by this objective, we attempt to answer the following research questions:

RQ1. Do men and women members' TPB predictors (attitude, SN and PBC) influence their own revisit intention after controlling for the existence of their relationship partner and how?

RQ2. Do men and women members TPB predictors (attitude, SN and PBC) influence each other's revisit intention and how?

Using a sample of 125 heterosexual couples and dyadic data collected onsite, our research attempts to unravel the "how" question by investigating both intrapersonal and interpersonal influences of TPB predictors and revisit intentions within the couple contexts. Past research investigating social influence on decision-making often overlooked the role partners play. Guided by the framework of TPB and APIM, this research contributes to tourist behavior knowledge by separating the relationship partner from other social influence sources and empirically exploring the intrapersonal and interpersonal effects of TPB at the dyadic level. This research also benefits practitioners in the tourism and hospitality industry. Knowing that couples make joint decisions provides less resolution in targeting their marketing strategies.

Our research sets out to improve such segmenting precision while treating couples as the decision-unit. For example, by determining which member's attitude is more influential in not only their own but also their partner's revisit intention would allow for targeted service designs and marketing appeals. Similarly, knowing which member's social network is more influential can help marketers direct their marketing efforts with those social referent groups.

LITERATURE REVIEW AND THEORETICAL DEVELOPMENT

Tourism decision-making: theoretical background

The study of tourist decision-making largely follows the development of consumer behavior theories. From their early emphasis on subjective expected utility (SEU) to a much more nuanced perspective of adaptive decision-making (Smallman & Moore, 2010), the theoretical evolution reflects the complexity of consumer choices (Decrop, 2006). The early focus on individuals' pure rationality posited that consumers make choices based on cognitive evaluations of outcomes, and choose the alternative that maximizes their expected utility. The concept of "bounded rationality" then emerged, arguing consumers face constraints in information or time deficiency and tend to seek optimal instead of maximized utility. Later on, the concept of "adaptive decision-making" postulated that individuals consider various factors depending on specific situational contexts, personal characteristics, and their social environment. For example, when a decision involves others, various needs and wants are considered in reaching a compromise. Tourists' decision-making is influenced by many factors (Decrop, 2006; Decrop & Snelders, 2005; Engel et al., 1968; Loi et al., 2024). Decrop (2006) categorized major factors into three groups: socio-psychological variables (e.g. perceptions, attitudes), personal variables (e.g. needs and wants), and environmental variables (e.g. interpersonal and situational influences). Among the various constructs and theories explaining tourists' decision-making, the rational decision-making school of thought are continued to be used by tourism researchers (Cohen et al., 2014; Hasan et al., 2020; Loi et al., 2024).

TPB and revisit intention

The Theory of Planned Behavior (TPB, Ajzen, 1991) is widely adopted in understanding individual tourist decision-making, including revisit intention (Ulker-Demirel and Ciftci, 2020). Revisit intention, i.e., the likelihood of a visitor returning to a previously visited destination, is the extension of visitors' post-purchase evaluation (Um et al., 2006)5/14/2025 9:26:00 AM, and directly predicts brand loyalty. TPB posits that the intention is influenced by three major constructs: attitude, subjective norms (SN), and perceived behavioral control (PBC). Meta-analysis suggests that TPB robustly predicts individual's intentions and behaviors across various domains (Armitage & Conner, 2001). In tourism and hospitality contexts, the three main TPB constructs are defined as following:

Attitude refers to an individual's overall evaluation of the target experience, based on "expectancy-value". Attitude reflects the level of "liking" (Ajzen, 2020). One's attitude toward a service is formed through relevant accessible perceptions such as service quality (Han & Kim, 2010), servicescapes (Meng & Choi, 2018; Quintal et al., 2015), or relevant cues of festival attributes (Vesci & Botti, 2019). In most cases, an individual's attitude significantly predicts that individual's revisit intention (Bianchi et al., 2017; Hsu & Huang, 2012; Loi et al., 2024).

Subjective Norm (SN) refers to the perceived social influence to perform or not perform a target behavior. SN is influenced by both normative beliefs about what "significant others" think and descriptive beliefs about what "significant others" do (Ajzen, 2020). SN has been a strong predictor of a tourist's visit/revisit intentions (Han & Kim, 2010; Hsu & Huang, 2012; Juschten et al., 2019; Lam & Hsu, 2004, 2006; Nguyen et al., 2024).

Perceived Behavioral Control (PBC) refers to an individual's perceived ease or difficulty in performing a target behavior. PBC is a significant predictor of revisit intention in various contexts, such as revisiting themed restaurants (Meng & Choi, 2018), green hotels (Han & Kim, 2010), and winery resorts (Quintal et al., 2015) but not in the context of revisiting festivals (Choo et al., 2016; Vesci & Botti, 2019). Despite criticisms regarding its assumptions of rationality and limited consideration of emotional and external factors (Armitage & Conner, 2001; Perugini & Bagozzi, 2001; Sniehotta et al., 2014; Ulker-Demirel & Ciftci, 2020), the TPB's simplicity, generalizability, and robust predictive ability make it a suitable tool for understanding tourist behavior (Armitage & Conner, 2001). However, TPB's focus on (independent) individuals overlooks the complex interplay of decision-making when more than one individual is involved, such as joint-decisions in group vacations (Cohen et al., 2014). Specifically, although TPB acknowledges social influence with the construct of SN, SN is ultimately internal to an individual perception. As a result, the non-independence of more than one decision-maker has been systematically omitted in TPB thus far.

Joint decisions in the couple vacation context

The research on vacation decision-making in couples has evolved from focusing on the relative influence of which decision men or women make to a consensus of joint decisions. Early on, studies often assumed decisions were made solely by either men, women, or both (Cosenza & Davis, 1981; Fodness, 1992; Jenkins, 1978). Recent literature highlights a democratic pattern where both partners have similar influences on vacation decisions (Barlés-Arizón et al., 2010; Kang & Hsu, 2005; Litvin et al., 2004, Mottiar & Quinn, 2004). For example, based on children's perceptions across 25 countries, Cheng and colleagues (2019) found that both men (fathers) and women (mothers) have a similar influence on vacation decisions. In another study of 375 heterosexual couple dyads, Rojas-de-Gracia et al. (2019) found that, except for information search, there is a "joint structure" in most sub-decisions. Some research has realized the importance of the dyadic approach in studying couple tourists but could not pinpoint how individual characteristics influence the dyadic decision. Researchers investigated how group-level characteristics such as couple cohesion and communication tactics influence decision satisfaction (Barlés-Arizón et al., 2010; Cheng et al., 2019; Gracia & Alarcón-Urbistondo, 2016; Kang & Hsu, 2005; Litvin et al., 2004; Mottiar & Quinn, 2004; Rojas-de-Gracia & Alarcón-Urbistondo, 2019). For example, Kozak (2010) studied a Turkish sample of 226 married individuals regarding their vacation planning and dining-out decision-making. They found that cooperative couples who compromise with their partners have higher satisfaction with their purchase and recommendation decisions. In other words, relationship harmony makes couples' tourism experience more enjoyable. However, less is known about individual factors nor their interactions in this process. One reason limiting researchers' investigation effort in studying couple tourists is the methodology, i.e. the independence assumption (Gullo, 2020; Simpson et al., 2012b).

This statistical premise requires that data points are independent to make unbiased estimations and valid inferences. In a couple dyad, however, both members' scores are often correlated (i.e. non-independent) because of their shared experiences and relationship. This "common fate" often leads to two members from a couple reporting more similar scores than other couple units (Kenny, 2006). For instance, as a couple, Mary's attitude toward the hotel they stayed in tends to be more similar to John's attitude than those outside of their relationship. For researchers, such common variation makes it "impossible" to separate the individual influences within a couple, other than aggregating to the dyadic level characteristics (Kang & Hsu, 2005; Rojas-de-Gracia et al., 2017, 2019; Rojas-de-Gracia & Alarcón-Urbistondo, 2019). In this research, we attempt to solve the methodological challenge by extending the traditional TPB with the Actor-Partner Interdependence Model (APIM) which provides a statistical solution (Kenny et al., 2006).

Hypotheses Development

Joint decisions by couples suggest that there is only one shared behavioral outcome for the dyad. For example, revisit or not. Although vacationing couples are treated as a single decision-making unit (Decrop, 2006, 2008), they are composed of

two individuals with unique needs and wants (Kang & Hsu, 2004, 2005). According to the Independence Theory (Kelley & Thibaut, 1978), individuals in close relationships influence each other's opinions and outcomes due to shared experiences and situations. This suggests that decision-making within a couple is not solely an individual process but involves mutual influences of two partner's perspectives and preferences. When a couple travels together, two individuals develop their own psychological formations (Lam & Hsu, 2006) influencing their revisit intentions. Under TPB framework, each partner's evaluation of the product (attitudes), susceptibility to social influence (SN), and perceived behavioral control (PBC), are positively associated with their own revisit intention. Previous research has provided abundant evidence that individual effects of attitudes, SN, and PBC jointly predict the revisit intention within the TPB framework, but such individual models ignored the potential impact of the relationship partner. There are two individuals in a heterosexual couple, and we anticipate by controlling the existence of the partner and their influence, each member's revisit intention is predicted by their own set of TPB predictors interpersonally. Specifically,

For men: **H1a:** His attitude positively predicts his own revisit intention.
H1b: His SN positively predicts his own revisit intention.
H1c: His PBC positively predicts his own revisit intention.
For women: **H1d:** Her attitude positively predicts her own revisit intention.
H1e: Her attitude positively predicts her own revisit intention.
H1f: Her attitude positively predicts her own revisit intention.

The Interdependence Theory suggests that close relationship partners rely on each other, provide emotional support, and affirm each other's behaviors and decisions (Kelley & Thibaut, 1978). This interdependence may be embodied in the couple's course of interaction and relationship development. We presume that each member's attitude, SN, and PBC will not only influence their own intention but also their partner's revisit intention because couples have endured interaction and communication during their shared vacation (Kozak & Duman, 2012). For instance, in their research with 445 British families in Turkey, Kozak & Duman (2012) found that respondents revisit intention was significantly influenced by their spouses' vacation satisfaction. This indicates that if one partner holds a strong positive attitude towards a hotel, through communication, their preference may be learned by the other partner, who would therefore report higher revisit intention. Similarly, if one partner talks about how their friends (or other social referents) enjoyed their positive experiences, the other partner may also be persuaded, and their revisit intention enhanced. Furthermore, if one partner is confident in revisiting the hotel, their perceived control may as well empower the other half to feel the same.

Therefore, we anticipate that each partner's attitude, SN, and PBC influence the other's revisit intention. Specifically,

For men: **H2a:** His Attitude positively predicts her revisit intention.
H2b: His SN positively predicts her revisit intention.
H2c: His PBC positively predicts her revisit intention.
For women: **H2d:** Her Attitude positively predicts his revisit intention.
H2e: Her SN positively predicts his revisit intention.
H2f: Her PBC positively predicts his revisit intention.

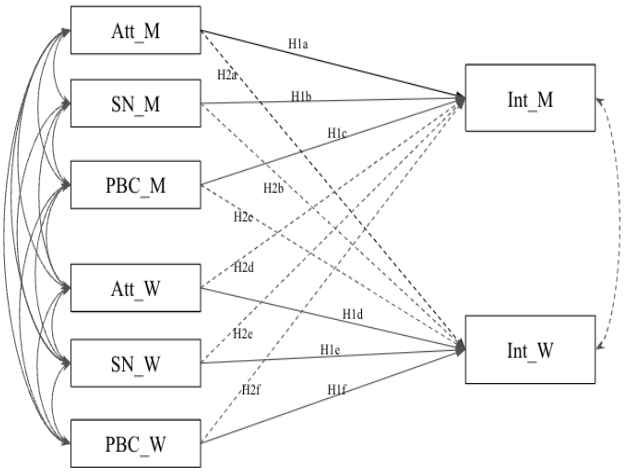


Figure 1. Theoretical Framework: the APIM-TPB Model (Note: the postfix "_M" indicates the male partner of a heterosexual couple, while "_W" indicates the female partner; Double-headed dashed paths represent "non-independence" of scores within a couple dyad. The single-headed solid paths represent actor effects (intrapersonal), and the single-headed dashed lines represent partner effects (interpersonal)

MATERIALS AND METHODS

Design and sample

This study employed a cross-sectional design to investigate the dyadic influences within the TPB framework among a couple guests to a hotel. Specifically, both men and women partners' attitudes, SN, PBC, and revisit intention were assessed concurrently. Upon approval from the Human Research Ethics Committee of Mae Fah Luang University and prior consent from the business owners, we collected data onsite at three local resorts in Doi Mae between November 2022 and February 2023. Doi Mae Salong is a popular tourist destination in northern Thailand known for its mountainous scenery,

tea plantations, and Yunnanese culture. Two trained research assistants approached hotel guests at breakfast venues, inviting coupled guests to participate in the study in exchange for a pack of tea. The intercept approach allows respondents to reflect on their experience while their memory was still fresh (Quintal et al., 2015). With consent, participants simultaneously and independently completed an electronic questionnaire on their personal cell phones, ensuring independent responses. We included only mixed-sex couples where 1) both individuals were 18 years or older, 2) were in a romantic relationship, and 3) had experienced the hotel together. Screened questions were asked at the beginning of the questionnaire to ensure criteria 1 and 2. Criterion 3 was achieved verbally by the research assistants in-situ. We excluded same-sex couple responses because using sex as a variable to distinguish members in a dyad is the most common practice in couple research using APIM (Garcia et al., 2015). Furthermore, distinguishable and indistinguishable dyads apply to different analytical procedures (Garcia et al., 2015). 304 responses were collected, after excluding 5 same-sex couples (10 responses), 8 incomplete and 36 unmatchable responses, a final sample of 125 dyads (250 individuals) was included in this study.

Measures

Key constructs from the TPB (Attitude, SN, PBC, and revisit intention) were measured using established scales adapted from previous research (Juschten et al., 2019; Lam & Hsu, 2006; Quintal et al., 2010, 2015). The scales were contextualized to the hotel setting and assessed using seven-point Likert scales. Each construct consisted of three to four items which were then averaged. In this current research, revisit intention was measured with three items (e.g. "I plan to visit this hotel again") ranging from 1 (strongly disagree) to 7 (strongly agree). Higher mean values reflect higher possibility of revisiting.

Attitude refers to how much a customer likes her/his experience with the hotel stayed and was measured by three items with opposite semantic terms (e.g., "All things considered, I think staying in this hotel would be…" very unenjoyable (1) to very enjoyable (7). Higher mean values reflect higher degrees of liking of the hotel stayed. SN was measured with four items using semantically different phrases, such as: "They would think that I… should not (1) – should (7)... choose to stay in this hotel". A higher mean value means a higher level of "non-partner" social influence perceived. Prior TPB research treated SN as a lump sum of social influences from various reference groups such as family and friends, work colleagues, and tour agents. As we specifically study how individual members' perceived SN influences each other's revisit intention, we singled out the influence of the relationship partner from other "significant others". To achieve this, we provided oral and written instructions describing the "significant others" should not include the relationship partner whom they travelled with. PBC was defined as the extent to which a customer thinks they are confident in deciding to stay in the hotel of choice. PBC was measured using a three-item Likert scale, for which respondents were asked their level of agreement ranging from strongly disagree (1) to strongly agree (7). e.g., "Whether or not I chose to stay in this hotel was entirely up to me".

Previous studies supported the TPB scales' internal consistency (Cronbach's alpha > 0.72) (Quintal et al., 2015). For the current study, Cronbach's alpha for the scales in every construct exceeded 0.9, suggesting good construct reliability (Hair, 2010). The questionnaire also collected demographic information including sex, age, education, employment status, and length of relationship, as summarized in Table 1. The timestamp and room number served later as the major basis for matching individual responses, which would then be restructured into dyadic datasets. Dyadic dataset structures are suitable for further structural model analysis (Kenny et al., 2006; Garcia et al., 2015). In this structure, one couple ID corresponds to two individual members (a man and a woman), and for each variable, there is a score for the men and women partners, indicated by "_M" and "_W" respectively. See specific measurement scales in Table 2.

Analysis strategy

Descriptive statistics such as frequency distributions or means and standard deviations were obtained to summarize demographic characteristics. Pearson correlation coefficients were used to determine correlations and non-independence among variable scores between the men and women partners. For inferential analysis, we applied the Actor-Partner Interdependence Model (APIM; Kenny et al., 2006) to examine both intrapersonal and interpersonal associations between attitude, SN, PBC, and revisit intention. The APIM is a statistical procedure for analyzing dyadic data. APIM suggests a couple member's predictor variable not only affects their outcome interpersonally (i.e. actor effect), but also affects their partner's outcome interpersonally (i.e. partner effect). In this study, actor effects referred to the impact of a person's attitude, SN, and PBC on their own revisit intention, and partner effects were the impact of a person's attitude, SN, and PBC on their partner's revisit intention. We adopted Structural Equation Modeling (SEM) to test the APIM using maximum likelihood (ML) estimation as SEM allows for setting path constraints and model comparison tests. Following Garcia et al.'s (2015) recommendation, we used chi-square and Sampled Adjusted Bayesian Information Criterion (SABIC) as indexes for model fit. All analyses were done in R, and a significance level of .05 was used throughout.

The APIM-SEM simultaneously estimates two structural equations, one for women's revisit intention (Int_W) and one for men's revisit intention (Int_M). We followed a three-step approach to test the APIM-SEM recommended by Gana & Broc (2019) and Garcia et al., (2015). Firstly, we estimated the baseline APIM where each partner's attitude, SN, and PBC are regressed on his/her own revisit intention as well as his/her partner's revisit intention, as depicted in Figure 1. This baseline model is saturated (df = 0) as we allowed all paths to vary freely. Secondly, to determine whether sex played a significant role and establish sex distinguishability of actor and partner effects, we created three sub-models, one for each predictor (attitude, SN, and PBC). In these submodels, we restricted the actor and partner effects to be equal across both members, for example, his attitude → his intention = her attitude → her intention (actor effect of attitude), and her attitude → his intention = his attitude → her intention (partner effect of attitude). By comparing the fit of each constrained submodel to the baseline model, we could assess whether accounting for within-couple sex differences significantly

improved the model's explanatory power. In other words, whether men and women influence themselves and their partners differently in the statistical sense. This sex difference would empirically justify the need to examine both members' scores in a dyadic unit, which is the premise for dyadic analysis with distinguishable dyads (Kenny et al., 2006). A significant decrease in model fit after constraining the effects equal across both members would mean that sex does make a difference (Kenny et al., 2006). Lastly, we selected the best-fitting model based on the Chi-square difference test and the SABIC criterion (Garcia et al., 2015). A non-significant Chi-square difference and a smaller SABIC indicate a better model fit. This best-fit model was then used to interpret the path coefficients and test our hypotheses.

RESULTS AND DISCUSSION

Demographic characteristics of the couple dyads

This study included 250 respondents, with an equal distribution of men and women from 125 heterosexual couples (Table 1). Most were in dating relationships (83.2%).

Table 1. Demographic characteristics of respondents (Source: Author's own work) (Note: N=250)

Demographics (n=250)		**Frequency**	**Percentage**
sex	Female	125	50
	Male	125	50
Relationship Type	Dating	208	83.2
	Married	42	16.8
Relationship Length	less than 1 year	4	1.6
	1-3 years	6	2.4
	3-6 years	14	5.6
	6-9 years	28	11.2
	9-12 years	26	10.4
	12 years or longer	172	68.8
Age	18-20	5	2
	21-30	8	3.2
	31-40	83	33.2
	41-50	102	40.8
	51-60	42	16.8
	61 and above	10	4
Education	none	2	0.8
	Elementary	1	0.4
	High School	17	6.8
	College diploma	40	16
	Bachelor's Degree	132	52.8
	Master's Degree	44	17.6
	PhD or higher	14	5.6
Employment	Unemployed	27	10.8
	Part-time	21	8.4
	Full-time	202	80.8
Monthly income	9000 baht or less	8	3.2
	9,001-15,000	13	5.2
	15,001-25,000	26	10.4
	25,001-35,000	39	15.6
	35,001-45,000	34	13.6
	45,001-55,000	30	12
	55,001-65,000	16	6.4
	65,001 or more	84	33.6
Hotel stayed	Baan Seesee	134	53.6
	Baan Hom Muen Li	98	39.2
	Wang Put Tan	18	7.2
Number of Children	0	116	46.4
	1	49	19.6
	2	61	24.4
	3	18	7.2
	4	6	2.4

Table 2. Measurement Scales and Item Loading (Source: Author's own work) (Note: N=250)

Items	**Item loading**
INT_M: Revisit intention of Men (alpha = 0.97)	
INT1_M: I plan to visit…again.	0.93
INT2_M: I will very much like to	0.98
INT3_M: I intend to visit… next time	0.95
INT_W Revisit intention of Women (alpha = 0.96)	
INT1_W: I plan to visit…again.	0.93

INT2_W: I will very much like to	0.97
INT3_W: I intend to visit… next time	0.92
Att_M: Attitudes of Men (alpha = 0.95)	
Att1_M: Boring/Fun	0.92
Att2_M: Unpleasant/Pleasant	0.92
Att3_M: Unenjoyable/enjoyable	0.95
Att_W: Attitudes of Women (alpha = 0.91)	
Att1_W: Boring/Fun	0.81
Att2_W: Unpleasant/Pleasant	0.93
Att3_W: Unenjoyable/enjoyable	0.92
SN_M: Subjective Norms of Men (alpha = 0.95)	
SN1_M: should not/ should	0.93
SN2_M: not approve/ approve	0.90
SN3_M: not choose/choose	0.91
SN4_M: not like/ like	0.92
SN_W: Subjective Norms of Women (alpha = 0.94)	
SN1_W: should not/ should	0.86
SN2_W: not approve/ approve	0.89
SN3_W: not choose/choose	0.91
SN4_W: not like/ like	0.95
PBC_M: Perceived behavioral control of Men (alpha = 0.92)	
PBC1_M: entirely up to me	0.95
PBC2_M: complete control whether…	0.94
PBC3_M: Nothing prevented me	0.80
PBC_W: Perceived behavioral control of Women (alpha = 0.92)	
PBC1_W: entirely up to me	0.90
PBC2_W: complete control whether…	0.94
PBC3_W: Nothing prevented me	0.84

Validity and reliability

Before proceeding with inferential analysis, we conducted tests to assess construct validity and reliability. Cronbach's alpha results suggested good internal consistency with alpha coefficients of 0.91~0.97. These values surpassed the recommended cutoff of 0.8 (Cortina, 1993). Before SEM, we performed confirmatory factor analysis (CFA). The CFA item loadings, composite reliability (CR), and average variance extracted (AVE) indices indicated robust construct reliability and validity, surpassing the standard cutoffs of 0.7 and 0.5 (Hair et al., 2006) (Table 3).

Table 3. Correlation matrix, reliability, and validity indices (Source: Author's own work) (Note *** p<0.001, ** p < 0.05 and * p <0.1)

	Att_M	**Att_W**	**SN_M**	**SN_W**	**PBC_M**	**PBC_W**	**Int_M**	**Int_W**
Att_M	1							
Att_W	.21*	1						
SN_M	.58***	0.15	1					
SN_W	.21*	.70***	.29**	1				
PBC_M	.43***	0.05	.56***	0.16	1			
PBC_W	0.17	.46***	0.15	.55***	.22*	1		
Int_M	.48***	.20*	.81***	.25**	.57***	.25**	1	
Int_W	.27**	.59***	.36***	.64***	.24**	.47***	.42***	1
mean	5.88	5.81	5.66	5.76	5.08	5.39	5.47	5.46
SD	1.45	1.46	1.46	1.34	1.82	1.72	1.52	1.53
CR	0.95	0.92	0.95	0.95	0.93	0.92	0.97	0.96
AVE	0.91	0.85	0.94	0.92	0.87	0.86	0.88	0.86
Cronbach's alpha	0.95	0.91	0.95	0.94	0.92	0.92	0.97	0.96

Correlations and Nonindependence

As presented in the correlation matrix in Table 3, three distinct types of correlations were observed. Firstly, at the individual level, attitude, SN and PBC exhibit significant correlations with revisit intention for both men and women. Secondly, at the interpersonal level, one partner's attitude, SN, and PBC are associated with the other partner's revisit intention. Thirdly, correlations between men's and women's scores on the same constructs were observed. For instance, revisit intentions (Int_M and Int_W) are significantly correlated between men and women partners. This nonindependence between the two members justify the suitability for APIM.

Baseline APIM and model fit comparison

Following Kenny's three-step SEM approach to APIMs, we estimated the baseline (unrestricted) APIM model. See Figure 2. Table 4 presents the estimates. In the baseline model, we allowed all effects to vary without any restrictions, which is a saturated model with df = 0. As shown in Figure 2, the model explained 66.8% of the variance of men's revisit intention ($R^2 = 0.668$) and 50.5% of the variance of women's revisit intention ($R^2 = 0.505$).

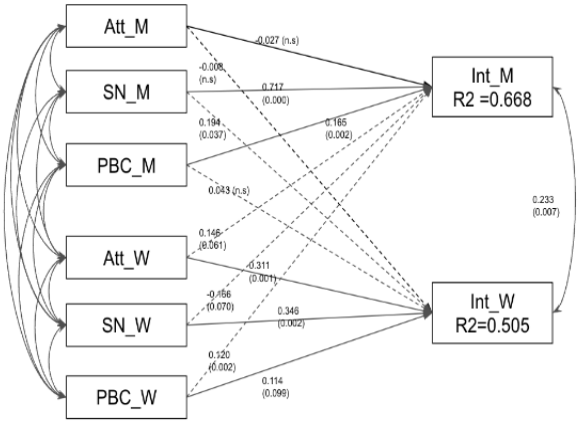


Figure 2. The Baseline APIM Model (Source: Author's own work)

Since the baseline model is saturated with df = 0, Chi-square was not available. By SABIC, the baseline model fitted at 713.378. We then created submodels by constraining the actor and partner effects of each construct the same across sexes.

In submodels 1, 2, and 3 the effects of attitude, SN, and PBC were constrained as equal across men and women members respectively. Table 5 provides a comparison of the submodels against the baseline. As suggested in Table 5, submodel 3 with the actor and partner effects of PBC constrained equal across men and women has the best model fit. Submodel 3 has a df = 2, an insignificant and smallest Chi-square difference of 1.822 (p = 0.402), and the smallest SABIC of 711.868. Similar to the baseline model, submodel 3 explains 66.2% of variance of men's revisit intention (R^2 = 0.662) and 51.2% of women's revisit intention (R^2 = 0.512). Submodel 3 fits the data better than all other submodels and the baseline model. This suggests that there is no empirical sex difference in both actor and partner effect of PBC within couples.

However, there are significant sex differences in the effects of attitude and SN, as the SABIC of submodel 1 (attitude-constrained) and submodel 2 (SN-constrained) are greater than that of the baseline (719.444, 717.838, and 713.378 respectively), and with significant Chi-square differences 7.792 (P = 0.02) and 9.398 (p = 0.009). In our dyadic TPB framework, sex distinguishability is established for attitude and SN, but not for PBC.

Table 4. Estimates of the Baseline APIM (Source: Author's own work) (Note: N = 125. The outcome variable is Revisit Intention.)

Effect	Coefficient	SE	p
Intercepts			
Men	0.187	0.454	0.680
Women	-0.222	0.557	0.690
Actor effects of Attitude			
Men (Att_M on Int_M)	-0.027	0.068	0.696
Women (Att_W on Int_W)	0.311	0.096	0.001
Partner effects of Attitude			
Men (Att_W on Int_M)	0.146	0.078	0.061
Women (Att_M on Int_W)	-0.008	0.084	0.926
Actor effects of SN			
Men (SN_M on Int_M)	0.717	0.076	0.000
Women (SN_W on SN_W)	0.346	0.112	0.002
Partner effects of SN			
Men (SN_W on Int_M)	-0.166	0.091	0.070
Women (SN_M on Int_W)	0.194	0.093	0.037
Actor effects of PBC			
Men (PBC_M on Int_M)	0.165	0.054	0.002
Women (PBC_W on Int_W)	0.114	0.069	0.099
Partner effects of PBC			
Men (PBC_W on Int_M)	0.120	0.056	0.002
Women (PBC_M on Int_W)	0.043	0.066	0.521

Table 5. Model Fit Comparison (Source: Author's own work) (Note N = 125. In model 01, the actor and partner effects of Attitude are constrained to be equal for men and women, releasing 2 degrees of freedom. Model 2 for SN constraints, and Model 3 for PBC)

Models	Chi-square	df	p	SABIC
Saturated Model	-	0	-	713.378
Submodel 1 (Att constrained)	7.792	2	0.02	717.838
Submodel 2 (SN constrained)	9.398	2	0.009	719.444
Submodel 3 (PBC constrained)	1.822	2	0.402	711.868

Model Selection

With the distinguishability test results by model fit comparison, we selected submodel 3 (PBC effects constrained equal) to interpret estimated results and test our hypotheses. Figure 3 and Table 6 presents the selected submodel and

coefficient estimates. On the intrapersonal level, men's revisit intention is significantly predicted by his own SN (beta = 0.725, p = 0.000) and a shared PBC (0.148, p = 0.000) but not his Attitude (p=0.766). As for women, her revisit intention is driven by all TPB predictors: her attitude (0.311; p = 0.001) SN (0.322; p = 0.003) and a shared PBC (0.148; p = 0.000).

Table 6. Coefficient Estimates of PBC-Constrained Submodel
(Source: Author's own work) (Note N=125. The outcome variable is Revisit Intention)

Effect	Coefficient	SE	p
Intercepts			
Men	0.229	0.454	0.613 (n.s)
Women	-0.293	0.557	0.599 (n.s)
Actor effects of Attitude			
Men (Att_M on Int_M)	-0.020	0.068	0.766 (n.s)
Women (Att_W on Int_W)	0.311	0.095	0.001***
Partner effects of Attitude			
Men (Att_W on Int_M)	0.149	0.078	0.055*
Women (Att_M on Int_W)	-0.021	0.084	0.802(n.s)
Actor effects of SN			
Men (SN_M on Int_M)	0.725	0.073	0.000***
Women (SN_W on SN_W)	0.322	0.108	0.003***
Partner effects of SN			
Men (SN_W on Int_M)	-0.147	0.089	0.100*
Women (SN_M on Int_W)	0.169	0.088	0.054*
Actor effects of PBC			
Men (PBC_M on Int_M)	0.148	0.042	0.000***
Women (PBC_W on Int_W)	0.148	0.042	0.000***
Partner effects of PBC			
Men (PBC_W on Int_M)	0.089	0.042	0.034**
Women (PBC_M on Int_W)	0.089	0.042	0.034**

These results suggest that the traditional individual level of TPB framework generally explains each member's decision-making patterns in the dyadic context, except for men's Attitude. On the interpersonal level, both men's and women's revisit intentions are positively influenced by each other's shared PBC (0.089, p = 0.034). However, when it comes to Attitude and SN, men and women influence each other differently. Specifically, at the 95% confidence interval, men's revisit intention is not influenced by her Attitude (0.149, p = 0.055) nor SN (-0.147, p = 0.100). But women's revisit intention is positively and significantly influenced by his SN (0.169; p = 0.054). These results suggest that above and beyond the actor effects, within the TPB framework, partner effects also exist in explaining each couple member's revisit intentions.

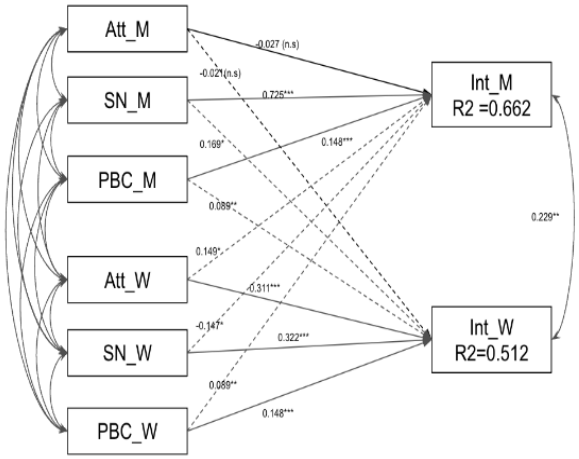


Figure 3. Paths and Coefficients of the PBC-constrained Model (Source: Author's own work)

DISCUSSION AND CONCLUSION

Building upon TPB, we extended the boundary of individual consumer behavior by examining a couple tourists' decision-making dynamics in APIM. With data collected from both members of 125 heterosexual couples (250 respondents) who have experienced their joint stay in a local hotel in northern Thailand, we explored the potential mutual influences between couple members in the mechanism of their post-experience decision-making. In our APIM by SEM approach, we simultaneously modeled for both men and women members' revisit intentions, while acknowledging the non-independence across different sexes. Aiming at exploring how joint decisions are made between two individual members of a couple regarding a revisit, we hypothesized that couple members' TPB predictors of Attitude, SN, and PBC predict their own revisit intention interpersonally (H1), and their partner's revisit intention (H2) interpersonally. Our results provided partial support to both sets of hypotheses. We now discuss the main findings and how they inform both theory and practice.

Sex differences within TPB in the couple context

Through model comparison, we justified the distinguishability of sex in effects of Attitude and SN, but not for PBC. This finding necessitated studying couples as the decision-making unit (Decrop, 2006) while examining each individuals' decision formation. Previous studies found sex as a moderator in various evaluation outcomes in the consumer decision-making domain. Such studies compared male and female groups as two groups of individuals. Our distinguishability test results indicate that sex difference in TPB predictors takes effect even when we study tourists at the couple level, which allows for further analysis of sex roles in the unit of couples. Traditional dichotomy of sex has drawn a lot of research interest and generated interesting knowledge which leads to a gender-role stereotype. In Meyers-Levy & Loken's (2015) review, they outlined five types of sex differences among these two groups of individuals. For instance, females are more other-oriented, and males are more self-oriented. Specifically in research applying TPB, contradicting results exist: e.g., females are more strongly influenced by SN and PBC in their willingness to pay for pro-environmental causes (López-Mosquera, 2016). Males are more strongly influenced by their social referents (SN) in their intention to visit green restaurants (Moon, 2021).

However, in the context of couple tourists, individual level of sex difference, or sex stereotype lacks accuracy because the two sexes are nested in one dyadic unit. Consider: while your boyfriend and mine are both male, their shared sex role might still have different implications in our unique relationships. In other words, examining sex difference with the couple text they are in allows for improved resolution of sex difference. Especially when such difference is important to identify roles within couples. Rojas-de-Gracia et al. (2019) claimed that only a clear identification of the decision-maker within a couple can allow further investigating of sex, motivations, attitudes, and other characteristics. We filled this gap with APIM. Besides sex distinguishability, APIM further allowed us to empirically examine how men and women influence themselves and their better half in making their decisions regarding revisiting a hotel.

Intrapersonal influences

We hypnotized in H1 that in the couple travel context, intrapersonal effects of TPB predictors positively influence their revisit intentions, and H1 are largely supported. Table 7 presents the test results. With H1, we confirmed TPB's explanatory ability intrapersonally, while controlling for couple partners. Our results suggested men's revisit intention is predicted by his SN and PBC but not his attitude (-0.020, p = 0.766), while women's revisit intention is predicted by all of the TPB predictors. Previous studies extensively used TPB to study consumers' decision-making, and our results aligned their results. Our findings contributed another empirical evidence supporting TPB, while controlling for couple partners. Interestingly, our findings suggest men's attitude does not predict his revisit intention to the hotel (-0.020, p = 0.766), unlike their female partners (0.311, p = 0.001). This suggests women's liking of the hotel has more influence compared to men's preference. The result aligns with previous findings on women's "gatekeeper" (Mottiar & Quinn, 2004) or "dominating" roles (Kim et al., 2010; Litvin et al., 2004; Rojas-de-Gracia et al., 2018; Rojas-de-Gracia & Alarcón-Urbistondo, 2018) in making travel related decisions especially for accommodation. Wang & Li, (2021) found that mothers (women) have a stronger individual identity and thereby the main decision maker. This implies that women's attitude is decisive in their family travels. Our finding concurs this result, but with more nuances within the couple context. The result that men's attitude failed to predict even his own intention implies that women's decision-making is not swayed by his tastes and liking of the hotel.

Table 7. Test Results of Hypotheses 1 (Source: Author's own work)

Hypothesis	Result	Coefficient	p-value
H1a: His Attitude → His Revisit Intention	Rejected	-0.020	0.766
H1b: His SN → His Revisit Intention	Supported	0.725	0.000
H1c: His PBC → His Revisit Intention	Supported	0.148	0.000
H1d: Her Attitude → Her Revisit Intention	Supported	0.311	0.001
H1e: Her SN → Her Revisit Intention	Supported	0.322	0.003
H1f: Her PBC → Her Revisit Intention	Supported	0.148	0.000

Interpersonal influences

By H2, we hypothesized that interpersonal effects of TPB predictors positively influence each other' revisit intention. Table 8 presents the results of Hypotheses 2.

Table 8. Test Results of Hypotheses 2 (Source: Author's own work)

Hypothesis	Result	Coefficient	p-value
H2a: Her Attitude → His Revisit Intention	Rejected	0.149	0.055
H2b: Her SN → His Revisit Intention	Rejected	-0.147	0.100
H2c: Her PBC → His Revisit Intention	Supported	0.089	0.034
H2d: His Attitude → Her Revisit Intention	Rejected	-0.021	0.802
H2e: His SN → Her Revisit Intention	Supported	0.169	0.054
H2f: His PBC → Her Revisit Intention	Supported	0.089	0.034

Most interestingly, we empirically tested partner effects of TPB in predicting couple members' revisit intentions. Above and beyond the intrapersonal influences, our findings suggest that interpersonal (partner) effects do exist. Specifically, men influence women with his SN, and women's social influence on men seems significant, and a shared PBC influences each other's revisit intention with no sex differences. Wang & Li (2021) reported that fathers (men) play an unimportant

"passive role" in the decision-making. In contrast, our findings highlighted the influence of his SN on not only his but also her revisit intention (0.169, p = 0.054). This indicates men's social influence might have a critical role in shaping the couple's decision-making. Interestingly, men's revisit intention seems to only subject to his own predictors (expect for a shared PBC), while women's intention is predicted by both her TPB and his SN. This may be explained by women's other-orientation (Meyers-Levy & Loken, 2015) that women makes her decision with more sensitivity to conditions, including how her partners' social network would evaluate the hotel, while men tend to be more self-oriented in his decision-making.

Implications

There has been a persistent lack of theory in guiding quantitative research in couple tourism decision-making (Gracia & Alarcón-Urbistondo, 2016). Our research advanced in family vacation studies by examining dyadic members' mutual influences in their different patterns of decision-making. By quantifying the intrapersonal and interpersonal influences between couple members under the TPB framework, we provided a more nuanced picture of how couples' influence each other in their revisit intentions. This provides fresh insights into the body of literature especially in couple tourists' decision-making. Methodologically, our approach revealed a more nuanced picture of patterns in couple decision-making with quantitative precision. Rojas-de-Gracia et al., (2019) noted the challenge of having to identify the decision-maker before investigating motivations and characteristics of couple members in the family tourism research, and our research provided another solution. Practically, our study offers valuable insights for tourism and hospitality providers targeting couple tourists. Recognizing that women's (instead of the men's) positive attitudes drive the couple's decision-making, tourism and hospitality businesses are advised to prioritize there marketing emphasis toward women's tastes and preferences, as they are the gatekeeper. Additionally, while positive social influence from both men and women is important, men's social network seem more influential as it not only predicts his but also her revisit intention.

Businesses are therefore advised to appeal to their guests' (especially the male partners') willingness to generate positive word-of-mouth, for example, by providing them incentives to share their experiences on social media, providing discount promotion to those recommended guests, or crafting marketing messages with male perspective, and direct their testimonials at male guests' friends and colleagues. At the same time, businesses are advised to ease couple tourists' logistical concerns, such as emphasizing on convenience features, and couple-friendly environment in their marketing message, as PBC, although not sex-specific, is a significant predictor of couple members' revisit intention.

Limitations and Future Directions

Our research does not come without limitations. As discussed earlier, at the 95% confidence interval, in our model, apart from the shared PBC, we only found one significant partner effect (Men's SN→Women's revisit intention). Studies with larger samples will likely yield more significant results. Secondly, we excluded same-sex couples in order to test sex-distinguishable dyads. Future research is encouraged to be more inclusive by studying on homosexual couples. APIM can also accommodate indistinguishable dyads, which can help future researchers gain more understanding on how same-sex couples make their tourism decisions. Our study focused on romantic couple decision-making dynamics. However, family vacations often involve additional stakeholders, particularly children (Khoo-Lattimore et al., 2015; Thornton et al., 1997; Wang et al., 2004) or cross-generation members (Wang & Li, 2021) Future research designs are encouraged to include more family members to investigate decision-making dynamics within bigger groups. Furthermore, we provided empirical analysis to data collected in the Asian context, given that couples' communication styles might be different across different cultures especially compared to the west, scholars in the west with accessible data might provide further insights to the

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GEOSPATIAL PATTERNS IN WOMEN'S TOURISM MANAGEMENT: ANALYSIS OF MANAGERIAL TRENDS AND GENDER IMPACT IN HUNGARIAN TOURISM SECTORS

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Abstract: Gender composition in tourism management plays a critical role in shaping operational efficiency, decision-making processes, and industry growth—particularly in geosites and tourist-dependent regions. This study investigates global geospatial patterns in women's involvement in tourism leadership, analyzing how gender dynamics influence managerial trends across various tourism sectors.Employing geospatial mapping and statistical techniques, the research draws on a comprehensive dataset that spans multiple countries and tourism contexts. It examines the regional variation in gender representation in managerial roles and its correlation with tourism performance, with a special focus on geosites—natural and cultural landmarks that attract high tourist traffic.The results reveal a marked geospatial disparity in the inclusion of women in tourism management. Regions with higher gender diversity in leadership demonstrate stronger tourism outcomes, including increased visitor engagement at geosites, more adaptive decision-making structures, and improved organizational performance. In contrast, regions with low female representation often lag in tourism growth and service quality. The study identifies cultural norms, institutional frameworks, and policy environments as key drivers of these regional differences. It underscores the importance of inclusive leadership in fostering innovation, resilience, and sustainable tourism development.The findings advocate for targeted policy measures and institutional reforms to promote gender-inclusive management structures. Ultimately, the study concludes that empowering women in tourism leadership not only addresses equity goals but also enhances sectoral dynamism, especially in geosite-rich regions—offering a strategic path toward more sustainable and resilient tourism industries.

Keywords: gender inclusion, spatial analysis, tourism sectors, leadership diversity, global analysis, regional tourism dynamics

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INTRODUCTION

Gender-sensitive tourism management is a key factor for regional economic success, especially in the Hungarian tourism sector. Previous studies have highlighted various difficulties faced by women, including discrimination, job insecurity and family responsibilities. The tourism sector in Hungary, as in many other parts of the world, is characterized by significant gender inequalities, particularly in management positions. Women tourism managers often face career insecurity, which is exacerbated by a variety of factors, including economic instability, job insecurity and the impact of the COVID-19 pandemic (Alreahi et al., 2023). The economic recovery following the pandemic highlighted significant regional disparities in tourism performance, which were particularly evident in Hungary's central and regional areas (Poór et al., 2023).

Gender mainstreaming in tourism is an increasingly important area of research, especially in the context of sustainable development and women's empowerment. The UN Sustainable Development Goals, particularlyabil Goal 5, emphasize gender equality as a key component of sustainable development, supported by various studies examining the nexus between gender equality and tourism (Efthymiadou, 2023; Alarcón & Cole, 2019). The tourism sector, being labor-intensive and diverse, presents unique opportunities and challenges for gender inclusion, which necessitates an understanding of how gender dynamics shape the design of tourism jobs. The role of women in tourism entrepreneurship is also key. Research confirms that women entrepreneurs and managers contribute significantly to local economies by creating jobs and generating tax revenues (Lin et al., 2022; Remsei et al., 2023a). This claim is supported by Domecq et al. (2020), who

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highlight the importance of understanding the gender dimensions of entrepreneurship within sustainable tourism. They propose a theoretical framework that unpacks the societal attitudes and stereotypes that often hinder women's entrepreneurship and suggest that addressing these biases is essential to promote gender equality in tourism. The role of gender in shaping perceptions of tourism development is also reflected in the attitudes of local residents. Studies have shown that women tend to have more positive attitudes towards tourism development, influenced by hospitality businesses' perceived social and economic responsibility (Boğan et al., 2020; Eagly & Wood, 2012). This suggests that the involvement of women in tourism planning and decision-making processes may lead to more sustainable and community-oriented tourism practices.

Gender mainstreaming in tourism development strategies is essential in terms of policy implications. According to Alarcón & Cole (2019), achieving gender equality is a matter of social justice and a prerequisite for sustainable tourism development. They highlight the link between gender equality and other SDGs, emphasizing that tourism cannot be sustainable without addressing gender inequalities. Sustainability also intersects with public opinion, particularly in labor markets influenced by environmental considerations, such as Hungary's growing battery production industry (Remsei et al., 2023b).

Gender-based barriers that limit women's career opportunities and create unequal career prospects in different regions often hamper the growth of women's careers in tourism management. This is especially true for disabled women, who encountered heightened barriers in both Hungary and Slovakia during the COVID-19 pandemic, as they struggled with workforce challenges (Jenei et al., 2024). Discrimination, family pressures, and differences in job security raise complex issues that affect not only individuals but also tourism performance. This paper addresses these issues and explores how efforts to promote inclusiveness can mitigate these barriers and improve regional tourism outcomes.

The research aims to explore the relationship between inclusiveness, regional differences and career barriers among female managers in the Hungarian tourism industry. The objectives of the study include examining how perceived inclusiveness affects job discrimination, family expectations and job security. Furthermore, to determine whether promoting inclusion can improve tourism performance while supporting the creation of a more inclusive and supportive work environment for female managers. Following is a review of key concepts related to gender inclusion and tourism management, previous related research, and the methodology used to analyze quantitative and qualitative data on the experiences of women managers. The results are presented in light of each hypothesis, and then the policy and regional development implications are discussed, with recommendations for enhancing inclusion in the Hungarian tourism sector.

LITERATURE REVIEW

Social role theory describes gender differences in occupational roles that result from the expectations of people's social environment. In such an environment, the family-related constraints on women's career development, discussed by Greenhaus & Powell (2012), are seen as counterproductive to professional development. The concept of gender inclusion in tourism is complex and encompasses different dimensions, such as employment equity, social engagement, and socio-cultural aspects of tourism practices. According to the ILO, gender inclusiveness refers to the systemic inclusion of different genders within the industry at all levels, from entry-level to senior management (ILO, 2020). Inclusiveness means treating everyone equally but also embracing diversity in a range of perspectives that promote the development of regional tourism and its sustainability (UNWTO 2019). Gender equality is increasingly recognized as a critical component of sustainable tourism development. Studies emphasize that achieving gender equality is essential to promote sustainable, inclusive, and sustainable economic growth in the tourism sector (Vila et al., 2021).

This perspective is in line with the UN Sustainable Development Goals, particularly Goal 8, which advocates for decent work and economic growth, highlighting the need for equitable participation of women in tourism-related employment. Emerging technologies, such as artificial intelligence, play a critical role in promoting sustainable tourism development by improving efficiency and innovation (Dávid & Dadkhah, 2023; Ng & Sears, 2020). Researchers argue that for tourism to serve this goal effectively, the future workforce must have the skills and capabilities to transform the sector, ensuring that women are not only participants but also leaders in the sector (Laksi & Monica, 2022; Szabó-Szentgróti et al., 2024).

Research argues that sustainable tourism cannot be achieved without the fair and equal participation of men and women, especially in sectors such as hospitality, which employ a significant number of workers (Murni et al., 2021; Kabil et al., 2024). However, the relationship between tourism and gender equality is not uniformly positive. Zhang et al. (2022) highlight that although tourism has the potential to empower women, it can also lead to marginalization.

Barriers to career progression for women in tourism

Women's career progression in tourism is often shaped by workplace discrimination, family responsibilities and challenges related to job security. Discrimination is a barrier to leadership opportunities, particularly in traditionally male-dominated industries (Smith et al., 2017). Family responsibilities disproportionately affect women, creating additional barriers to advancement (Greenhaus & Powell, 2012). Workplace discrimination remains a dominant problem in the tourism sector, often manifested in gender biases that limit women's career opportunities. Research shows that women often face the problem of a 'glass ceiling' which limits their progression to management positions despite their qualifications and skills. Research highlights that social barriers contribute to the low employment rates of women in hospitality despite their high levels of education and family support (Sobaih, 2024; O'Connell & McKinnon, 2021). This is in line with Gajić et al. (2021), who emphasize that organizational commitment and job satisfaction are crucial for women's performance in the travel industry, yet many face discrimination that undermines these factors. Furthermore, the representation of women in leadership positions is alarmingly low in many regions, particularly in the Middle East and North Africa, where only 5% of tourism companies

have a female leader (Hutchings et al., 2020). This systemic discrimination not only affects individual women but also has wider implications for organizational performance and gender equality in the labor market (Kőmüves et al., 2024).

However, family responsibilities are critical in shaping women's career paths in tourism. Women typically take on the majority of household responsibilities, which can exacerbate the challenges of balancing work and family life, especially in the context of family tourism (Chen et al., 2021). Women's role as primary caregivers can be a barrier to their participation in sustainable tourism development as they struggle to balance family responsibilities with career aspirations (Irawan & Nara, 2020). The interaction between family responsibilities and career ambitions is a significant barrier for many women, often leading to a cycle of underemployment and limited career development.

Job security challenges also further complicate the situation of women in tourism. The sector is characterized by a high degree of job instability, particularly in seasonal and low-paid jobs, which disproportionately affects women. Setiawan (2023) points out that although women make up a significant proportion of the tourism workforce, they often face wage disparities and limited career development opportunities. This is exacerbated by the fact that many women work in the grey economy, where job security is minimal and benefits are rare. The precarious nature of employment in tourism can discourage women from pursuing long-term career goals, as they may prioritize immediate financial stability over professional development. In addition, the COVID-19 pandemic has exacerbated these problems, leading to increased job losses and economic insecurity for women working in the sector (Chen et al., 2021).

The intersection of workplace discrimination, family responsibilities and challenges related to job security creates multiple barriers to women's career development in tourism. A variety of social, governmental and personal barriers contribute to the perpetuation of the glass ceiling, making it imperative for stakeholders to address these issues holistically (Merita & Dauti, 2020). Initiatives to promote gender equality in the workplace, such as mentoring programs, flexible work schedules and family-friendly policies, are essential to empower women in tourism. In addition, fostering a culture of inclusion and support within organizations can help to mitigate the effects of discrimination and encourage women's professional development. Changing societal attitudes towards women's role in tourism and hospitality is key to creating an environment in which women can thrive professionally (Alshareef & AlGassim, 2021). In addition, implementing policies that promote job security and fair pay can help create a more supportive framework for women's career development in tourism.

Gender inclusivity and career insecurity

Gender integration is a critical factor in reducing career insecurity, especially for women working in different professional fields. McKinsey & Company (2018) argue that gender diversity benefits organizational performance and provides a framework for analyzing the impact of inclusion on tourism metrics. Hygiene and workforce safety have been identified as crucial employer and employee responsibilities during pandemic conditions, shaping organizational commitments (Poór et al., 2021). EIGE (2019) offers a model linking inclusivity practices to job security and provides evidence on how gender inclusivity can help reduce career insecurity. Integrating inclusive practices can lead to a more equitable workplace and create an environment in which all individuals, regardless of gender, can thrive. Williams & O'Reilly's, 2018 inclusivity framework finds that performance gains through inclusivity practices are pronounced; therefore, this study hypothesizes that inclusivity will have a positive impact on tourism outcomes. Furthermore, Blau & Kahn, 2017 show that gender inclusiveness reduces perceived discrimination and increases job security, therefore creating an environment that allows women to advance in their careers.

One of the primary ways that gender inclusion can help to mitigate career insecurity is by broadening the standards for success within a professional environment. Veelen & Derks (2020) argue that redefining success by embracing different career paths can create a more inclusive culture, which ultimately benefits women by providing them with diverse role models and career options. This shift not only addresses gender differences in career development but also encourages men to participate in diverse roles, thus promoting a more holistic approach to career development. By fostering an inclusive culture, organizations can reduce the pressure on women to conform to traditional measures of success that often fail to take into account the unique challenges they face. Implementing a range of inclusive practices can significantly impact women's career paths by addressing the systemic barriers they face. Cruz (2023) argues that by creating a supportive environment that acknowledges and takes into account the diverse needs of employees, organizations can help mitigate the uncertainties that often accompany women's career development. This includes providing mentoring opportunities and resources that address the unique challenges women face in the workforce. The intersection of gender, ethnicity and socio-economic status makes it even more difficult for women to build a career. Minority ethnic women often face complex challenges in their careers, but do not necessarily feel excluded solely on the basis of their gender (Kele et al., 2022). This suggests that a nuanced understanding of inclusivity needs to take into account multiple dimensions of identity to support women's career development effectively. By recognizing women's diverse experiences, organizations can implement targeted interventions that address specific barriers, thereby reducing career insecurity.

Tackling gender stereotypes and prejudices in the workplace is also essential to creating an inclusive environment that supports women's career development. O'Connell & McKinnon (2021) highlight how persistent gender stereotypes can hinder the retention of women in STEM fields, highlighting the need for organizations to challenge these biases actively. By cultivating a culture that values diversity and promotes gender equality, organizations can mitigate the negative effects of stereotypes, enabling women to pursue their career plans without the constraints of societal expectations. Empirical research shows that inclusiveness pays off in improving tourism outcomes. For example, in the case of Hungary, UNWTO (2019) finds a positive relationship between inclusiveness and regional tourism indicators. In this regard, McKinsey & Company (2018) shows that companies reporting diverse leadership perform better financially and find similar evidence in the tourism sector.

The empirical results underscore that regions with higher inclusiveness not only have better tourism indicators but also report a reduction in job insecurity for women, as evidenced by Clark et al. (2020). These studies suggest that increasing gender inclusiveness can have economic and social benefits, promoting regional development in tourism

Challenges for women in management positions in the tourism sector

The European tourism industry has undergone a major transformation in recent decades, particularly in terms of the role of women in management positions. Despite a gradual increase in the representation of women at senior levels, the overall narrative around women in leadership positions remains challenging, particularly in terms of career insecurity. This literature review critically examines the linkages between female tourism industry executives and career insecurity in Europe, drawing on various studies that highlight the complexity of gender dynamics, employment conditions and the broader socio-economic context. The career precariousness of female tourism managers is deeply intertwined with social perceptions and structural inequalities within the sector. Research by Zhang et al. (2020) suggests that although women are increasingly recognized as capable leaders, the persistent stereotype of women as primary caregivers continues to undermine their professional identities. This dichotomy creates a challenging environment for women aspiring to leadership positions, as they often face the burden of balancing professional responsibilities with societal expectations in the home. While the tourism sector provides employment opportunities for women, it often perpetuates a mixed narrative of empowerment and exploitation (Je et al., 2020). The precarious nature of employment in tourism, characterized by low wages and unstable working conditions, exacerbates the career insecurity experienced by women managers, who may find themselves in both promising and dangerous terrain. Employment insecurity in the tourism sector is a critical issue in the literature. Robinson et al. (2019) emphasize that the tourism sector is characterized by deep social cleavages and economic inequalities that contribute to a culture of insecurity. This insecurity manifests itself in various forms, including job instability, high turnover rates and a lack of clear career pathways. These conditions are particularly disadvantageous for women managers, who already operate within the constraints of gender bias and discrimination. The challenges of securing stable jobs are compounded by the sector's historical dependence on low-wage labor and the seasonal nature of many tourism jobs, which can leave women managers vulnerable to economic fluctuations and job losses.

In addition, pandemic COVID-19 has exacerbated the existing vulnerability of the tourism workforce. Leung (2024) notes that the pandemic has amplified the talent challenges facing the sector, including labor shortages and skills shortages. The pandemic not only highlighted the fragility of employment in tourism, but also raised questions about the long-term sustainability of career paths for women working in the sector. The lack of clear career progression and the prevalence of temporary contracts contribute to a sense of insecurity that can discourage women from taking on leadership roles.

The literature also stresses the importance of addressing gender inequalities in the tourism workforce to mitigate the career insecurity of female managers. Buhalis et al. (2023) argue that despite the underrepresentation of women in managerial positions, the tourism sector offers viable opportunities for female entrepreneurship. However, the success of women entrepreneurs often depends on their ability to navigate a terrain fraught with gender bias and systemic barriers. Research by Lin et al. (2022) shows that societal attitudes towards women in leadership positions can lead to a double jeopardy situation, where female leaders are perceived as less qualified than their male counterparts. This perception not only affects their career progression but also contributes to a wider culture of discrimination that undermines their professional aspirations. According to Hutchings et al. (2020), gender discrimination in the workplace is not simply an individual issue but is deeply rooted in systemic inequalities that pervade the tourism sector. This systemic bias can manifest itself in various forms, including unequal pay, limited access to professional development opportunities and lack of representation in decision-making processes.

The literature also suggests that the challenges faced by female tourism managers are not solely a matter of individual ability but are also influenced by organizational culture and management style. Yuan et al. (2021) examine the impact of transformational leadership on employee engagement, highlighting the importance of supportive leadership in fostering a positive work environment. In the context of tourism, where emotional labor and customer service are of paramount importance, the presence of empathetic and inclusive leadership can significantly increase the job satisfaction and career security of female managers. Conversely, the absence of supportive leadership can exacerbate feelings of insecurity and hinder career development. The role of policy and institutional frameworks in shaping the experiences of women leaders in tourism cannot be ignored. Research highlights the need for policies that promote decent work and worker well-being in the tourism sector. Such policies are essential to create an environment in which women managers can thrive and feel secure in their career paths. The authors advocate for a productivity-based strategy that links service quality and job quality, emphasizing the importance of addressing systemic issues that contribute to career insecurity (Maggi & Vroegop, 2023).

Gender Dynamics in Regional Tourism: Insights from Recent Literature

The role of gender inclusivity in shaping tourism sector dynamics is increasingly recognized. Contemporary literature highlights that gender equity not only improves workplace environments but also drives regional tourism performance and socio-economic sustainability. This subchapter synthesizes recent studies, particularly those addressing European contexts, to complement the insights presented in the manuscript. Karali et al. (2024) provide a meta-analysis of rural tourism research over the past four decades, emphasizing the necessity of gender inclusivity to overcome systemic biases in tourism practices. Their review establishes that diverse leadership fosters innovation, vital for rural and geosite tourism development. This aligns with findings from Martínez-Díaz & Badia (2024), who reveal how gender awareness in public systems like transportation directly influences mobility and participation, thereby indirectly benefiting tourism sectors through improved accessibility.

Niemczyk et al. (2024) explore the role of women in sustainable development within Europe. Their cross-country analysis shows that higher female participation in tourism management correlates with improved economic and environmental outcomes. This complements Antczak & Miszczyńska's (2024) findings on presenteeism determinants, which include gender perspectives, illustrating how inclusivity reduces inefficiencies linked to absenteeism or overwork.

The work of Ramos-Ruiz et al. (2024) delves into gender bias in tourism event perceptions, demonstrating that cultural stereotypes persist even in tourism-focused regions like Spain's Sierra Morena Rally. Their research underscores that regional tourism success often relies on shifting societal attitudes, which are deeply gendered.

Health and spa tourism emerges as a sector ripe for gender-inclusive policies. According to Badulescu et al. (2024), female leadership in destinations like Baile Felix Spa Resort, Romania, has led to innovative health-tourism services that attract diverse demographics. This resonates with Horeczki's (2024) findings on rural development trends, which indicate that regions embracing gender-diverse leadership in tourism report higher long-term growth. These studies underscore the intertwined nature of gender inclusivity and tourism sector success, reinforcing this manuscript's findings. Future research should integrate these insights into strategic policy recommendations to enhance inclusivity across all regional tourism domains.

Epitome & Hypotheses

It also indicates that inclusivity has important implications for tourism performance and career advancement. The studies indeed support the hypothesis that inclusivity correlates with economic growth, particularly in regions with gender-diverse leadership. According to McKinsey & Company (2018) and UNWTO (2019), such a hypothesis is supported. However, discrimination and family obligations are still significant barriers to improving industry-wide policies, as stated by Smith et al. (2017) and Kossek et al. (2017). This review infers that the practice of inclusivity is linked with job security and regional tourism competitiveness; therefore, setting a sound basis for the hypotheses in this study.

The authors list their hypotheses as follows:

H1. Regions within Hungary with higher gender inclusivity in tourism management roles report better tourism performance and visitor engagement in geosites.

H2. Female managers in Hungary's tourism sector perceive significant levels of workplace discrimination, particularly concerning career advancement and opportunities for leadership roles.

H3. Family responsibilities and societal expectations in Hungary have a negative impact on the career progression and management aspirations of women in tourism management.

H4. There are notable regional disparities within Hungary regarding the extent of perceived discrimination and bias against women in tourism management roles, with certain regions exhibiting more gender-inclusive practices

H5. Female managers in Hungary's tourism sector experience considerable career-related uncertainties, including job security and limited advancement opportunities, especially in areas with lower gender diversity in management roles.

Table 1 summarises the evolution of our hypotheses.

Table 1. Summary table #1– Development of hypotheses

No.	Relevance	Purpose	Problem	Literature review	Hypothesis
H1	Gender inclusivity impacts tourism performance.	Examine link between inclusivity and tourism metrics.	Lack of gender diversity may hinder tourism success.	McKinsey & Company (2018) point out that higher gender diversity is related to improved organizational performance in various industries, including tourism. On the other hand, UNWTO (2019) asserts that such environments improve sectoral competitiveness and innovation. ILO (2020).	Regions with higher inclusivity report better performance.
H2	Discrimination affects career progression in tourism.	Assess perceived discrimination among female managers.	Career barriers exist for women in leadership.	According to Smith et al. (2017), female leaders face discriminatory practices which hamper their successful career path, particularly in male-dominated industries. A study conducted by Catalyst in 2018 also showed how gender discrimination limits leadership opportunities for women around the world.	Female managers perceive significant discrimination in advancement.
H3	Family expectations hinder women's career advancement.	Evaluate family impact on career progress.	Balancing family and career is challenging for women.	Studies by Greenhaus & Powell (2012) and Kossek et al. (2017) show that family obligations limit women's career opportunities more than men's, affecting work-life balance and career advancement. Additionally, Ng and Sears (2020) highlight that family roles disproportionately impact female managers' career progression.	Family roles negatively impact women's career growth.
H4	Regional disparities affect inclusivity in tourism roles.	Identify inclusivity variations across Hungarian regions.	Inclusivity practices vary widely by region.	Studies by Williams & O'Reilly, 2018; OECD, 2021 indicate that regional inclusivity disparities beget unequal career opportunities, and the regions with no inclusivity practices have reported increased rates of discrimination.	Regional disparities exist in perceived discrimination.
H5	Job security concerns impact women in low-inclusivity areas.	Explore career uncertainty among female managers.	Job insecurity affects advancement in less inclusive areas.	Studies by Blau & Kahn (2017) and Clark et al. (2020) show that job insecurity due to a non-inclusive environment is higher among women, hence negatively impacting their career satisfaction and growth. Inclusion is associated with greater stability in one's jobs and, for that matter, lesser career uncertainty. EIGE, 2019.	Women face uncertainties in areas with low diversity.

MATERIALS AND METHODS

The chapter presents a methodological approach for the investigation of the geospatial patterns and effects of gender inclusivity on women managers in the tourism industry of Hungary. It seeks to investigate the contribution of gender diversity toward regional tourism performance and workplace experiences of women managers, focusing on issues like discrimination, family responsibilities, and career uncertainty. A mixed-methods approach combines quantitative data from the structured response parts of the survey with qualitative insights from open-ended items in the questionnaire to test the hypotheses. Such an approach enables the capture of gender dynamics across the varied regions of Hungary, hence enabling the contextualization of statistical trends, while those factors that influence the adoption of inclusivity practices and their impacts on the career development of women in tourism are also contextualized.

Materials

Data type: Primary data were used for this research from a pilot study carried out on female leaders from Hungary from the tourism sector. This study will be based on primary data generated through an extensive questionnaire that will be administered to female managers operating in the tourism sector in Hungary. It covers a wide array of information related to respondents' personal backgrounds, professional role, and experiences about gender inclusivity, workplace discrimination, career progression, family responsibilities, and job-related uncertainties. It includes middle and senior management-level women across various regions in Hungary to underline the country's regions that are well noted for tourism activities, hence allowing a granular geospatial analysis of the status of gender inclusiveness and variation across regions. The variables of the questionnaire are of three types: nominal, ordinal, and ranked. The nomination and ranking refer to professional position of middle-level and high-level managers, level of education, and number of subordinates, as well as two personal characteristics-marital status and number of children. In the substantive parts of the survey, the instrument measures the perception of workplace inclusiveness by female managers, discrimination with respect to leadership opportunities, and societal and family expectations and feelings of job security. Furthermore, this dataset also embraces the regional dimension by testing how patterns of inclusiveness match up against notions of tourism performance in Hungary, drawing upon relevant hypotheses on regional disparities and their implications for the managerial challenges faced by women in tourism. Convenience sampling was spread across different regions in Hungary, emphasizing that the informants came from an area where tourism activities were more observable. Industry networks, tourism associations, and regional tourism bodies were used in the recruitment process in an attempt to get representation from both urban and rural regions. Such a method allowed the authors to depict a variety of geographic and organizational contexts in the Hungarian tourism context. Actual data collection lasted for some months to accurately represent the managerial experiences of women in the different Hungarian tourism hubs. The qualitative responses are coded, and the quantitative ones categorized in light of the hypotheses of the study. Responses in respect of workplace discrimination, family responsibilities, and job security were all changed into ordinal categories that allowed structured analysis. The geospatial data on regions of respondents allows for mapping of inclusivity patterns and its relations with tourism performance metrics. Structured preparation thus allowed for a robust analysis to support or refute the hypotheses developed in this study on regional inclusivity practices and their implications for women's experience in tourism management. Figure 1 highlights substantial disparities in inclusivity scores across regions. Central Hungary, with a score of 4.3, stands out as the most inclusive, while Northern Hungary scores significantly lower at 2.1, reflecting limited inclusivity practices. The Great Plain falls in between, indicating partial inclusivity but room for improvement.

Methods

Study design: Experimental design, Observational, Cross-sectional, Longitudinal, Case study, Correlational, Sequential, Exploratory, Descriptive, Quasi-experimental design, Mixed-methods design, Grounded theory, Delphi method.

Measurements and calculations: The quantitative analysis includes measuring key variables related to gender inclusivity, discrimination, family responsibilities, and job security among female managers. For Hypothesis 1 (H1), a quantitative score for gender inclusivity was computed by aggregating responses about representation and organizational support for women in managerial roles. For Hypotheses 2 (H2) and 3 (H3), responses regarding discrimination and family-related career impact were quantified on a Likert scale, measuring the perceived impact on career advancement and aspirations. The scores for perceived job security and advancement opportunities (H5) were calculated based on responses indicating personal job stability and future career prospects within the tourism sector.

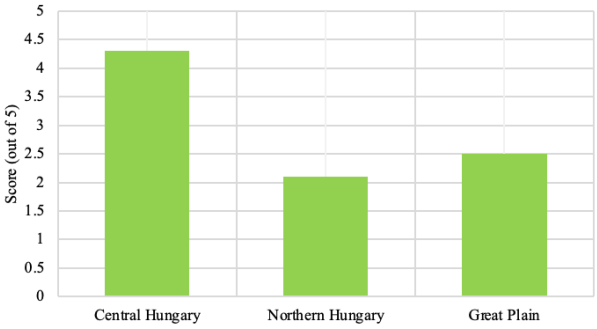


Figure 1. Regional inclusivity scores

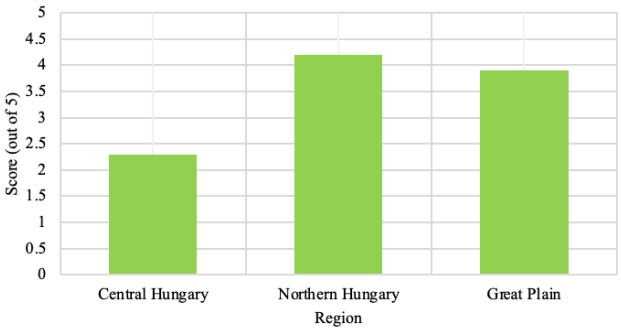


Figure 2. Regional discrimination scores

Statistical tests: To test the relationship between regional inclusivity and tourism performance, correlation and regression analyses were conducted, focusing on data from Hypothesis 1. The regional data on tourism metrics, such as visitor engagement and performance scores, were analyzed against gender inclusivity scores to identify any significant correlations. For Hypotheses 2, 3, 4, and 5, descriptive statistics such as mean scores and standard deviations were calculated to understand central tendencies in perceptions of discrimination, family impacts, and job security. ANOVA tests were used to analyze regional differences in discrimination levels for Hypothesis 4, determining if significant variance exists between different Hungarian regions in terms of workplace discrimination (Figure 1)

The discrimination scores show an inverse relationship to inclusivity (Figure 2). Northern Hungary, with the lowest inclusivity, reports the highest discrimination score (4.2). Central Hungary, with the highest inclusivity, reports the lowest discrimination score (2.1). This trend validates the hypothesis that inclusivity reduces perceived discrimination.

Interviews: For open-ended responses, a qualitative analysis is done to identify in detail some of the problems the women managers are facing. Responses concerning personal experience about discrimination, family-work balance, and job insecurity have been thematically coded to identify recurring themes and sentiment. The analysis gives an enriched contextual understanding that underlines common challenges, supplementing the quantitative results, mainly for Hypothesis 2 and 3.

Case studies: The representative case studies of different regions of Hungarian practice that might illustrate variation in the practice of Hypothesis 4 were chosen. These case studies developed a realistic view of challenges in inclusiveness and comparison across such regions of high and low inclusiveness. The combination approach of quantitative-qualitative inquiry thus allowed for comprehensive means of verifying the hypotheses of the study based on statistical stringency and contextual analysis in attempts to understand the variations in regional inclusiveness and their consequences for career development among Hungary's women managers within the tourism industry.

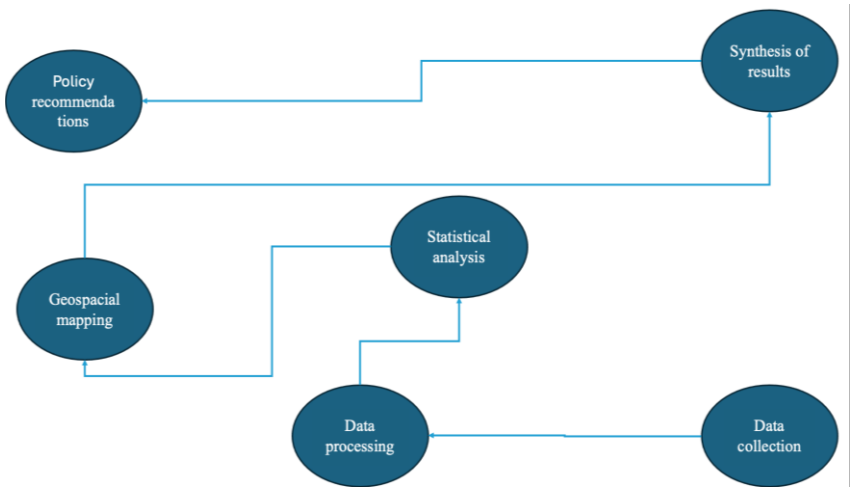


Figure 3. Methodology flowchart

The flowchart on methodology (Figure 3) shows the structured approach adopted for this study in understanding the aspect of inclusivity of gender in the tourism sector in Hungary. This flows from data gathering, which includes acquiring primary data through questionnaires and interviews among female managers in the tourism industry. The data collected includes views on inclusivity, experiences on issues of discrimination, job security concerns, and challenges on family and career. The processing procedures, such as organization, coding, and reduction of data into quantifiable measures like inclusivity score and discrimination indices, start at the time of collection. A systematic preparation at this stage will provide a good primer for the subsequent substantive analysis. It is at this statistical analysis phase that testing of these hypotheses through ANOVA, regression analysis, and non-parametric tests is done. From the perspective of these statistical methods, there would appear to be an association involving inclusivity practices, job security, perceived discrimination, and tourist performance. Geospatial mapping shall visually indicate the way regional differences in inclusivity also impact tourism performance. This shall outline spatial trends and regional disparities against a clear visual backdrop.

Results synthesis, on the other hand, is the last stage that integrates the findings of the two statistical and geospatial analyses-within a single context. This process ascertains that the findings are evidence-based but kept relevant within context. Through this process, this product develops conclusions and recommendations at the policy level where practical measures are prescribed to attain inclusivity, limit discrimination, and enhance security at work. Recommendations derive from some elements of regional inequalities that are identified throughout the processes of analysis. Overall, it is a flowchart that epitomizes holism and connectedness in such a way that each step is not only indispensable but also intertwined with the general objective of the study, which connects gender inclusivity to better outcomes in tourism management and performance. This visual structure characterizes iteration and comprehensiveness in the research methodology.

RESULTS AND DISCUSSION

This chapter summarizes selected research findings on aspects of inclusiveness for female managers within Hungary's tourism industry, relating it, where possible, to regional tourism performance, perceived discrimination, impacts on family,

and job security. Quantitative results, including a total of 120 managers who responded, ranged between inclusiveness scores of 2.1 and 4.3 across regions. Qualitative insights showed that 65% of managers felt that family responsibilities hinder career progress. Moreover, 75% have also testified to experiencing gender-based discrimination, which affects job satisfaction and promotion prospects. This chapter consolidates quantitative and qualitative results synthesizing the quantitative tests of the hypotheses on inclusivity and regional disparities in shaping women's career experiences.

Descriptive Statistics

The discrimination score averaged 3.4, reflecting a moderate degree of perceived workplace discrimination. Family impact had a median score of 3.6, indicating that family responsibilities weigh moderately in the way of career development. Most of the responses fell in the level 4 category, depicting a high level of perceived instability with regard to job security (Table 2)

Standard deviations: Discrimination levels had a standard deviation of 1.2, indicating moderate variability. Variance: The variance for family impact scores was 1.44, showing consistency in the responses. Range: Job security scores ranged from 2 to 5, indicating a widespread in perceptions. Quartiles and Interquartile Range (IQR): The IQR for job security was 1.

Skewness: The discriminatory scores illustrated positive skewness of 0.8, indicating the trending toward higher discrimination perceptions. Kurtosis: The kurtosis for job security scores was 3.1, reflecting heavier tails, meaning the distribution showed various perceptions of job security among respondents.

Table 2. Results of frequency distribution

Variable	Most Frequent Score	Percentage of Responses	Interpretation
Discrimination Level	3	40%	Moderate perception of discrimination.
Family Responsibility Impact	4	45%	High impact of family responsibilities on career.
Job Security Concern	4	50%	Considerable job instability perceived by respondents.

Frequency distribution: Histograms: Discrimination scores showed the highest frequency at level 3, reflecting moderate perceptions among respondents. Frequency tables: Family responsibility impact peaked at level 4, with 45% of responses indicating a high effect on career progression. Job security concerns were most frequently observed at level 4, suggesting considerable instability. Overview of the most frequently reported scores for key variables are given in Table 2 and give a picture of the central trends in the perception of respondents. The data analyzed reveal that the female managers in the tourism sector of Hungary strongly feel that moderate discrimination, high impact of family on career, and a large extent of job insecurity prevail. Figure 4 shows frequency distribution of key variables. The figure shows that concerns related to job security and family responsibilities are particularly high, with most respondents feeling there are a lot of problems in these areas.

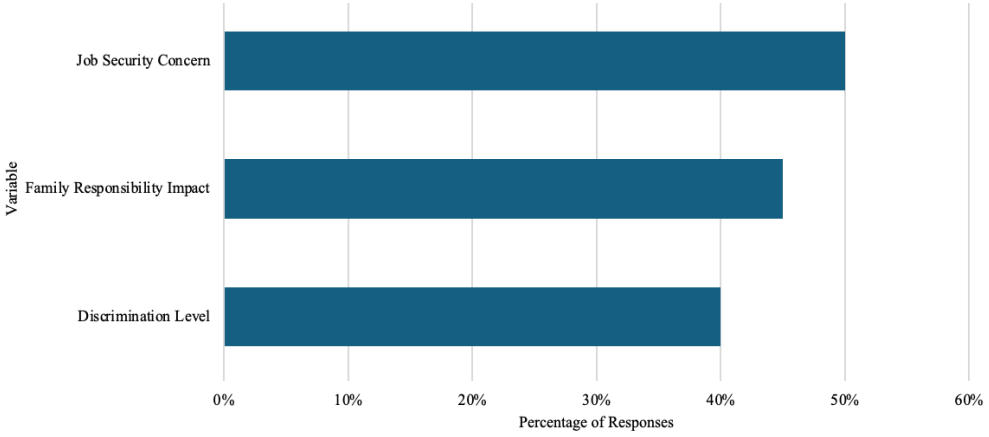


Figure 4. Distribution of response frequencies for main factors among female managers in tourism

Relative value position: Percentiles: Discrimination levels reported the 75th percentile at 4, indicating that most responses were from the level of moderate to high. Quartiles: Family responsibility impact scores placed the median at the 50th percentile, indicating a moderate impact on career. Job security scores placed the 25th percentile at 3, showing that most the respondents felt lower perceived stability.

Univariate Analysis

Chi-Square Goodness of Fit Test: The Chi-Square test was performed to establish if the observed frequency of perception of discrimination for female managers across regions falls in line with the expected distribution. Differences were significant: $\chi^2 = 18.56$, $p < 0.05$, thus, indicating that in not all regions, the experiences of discrimination are equally shared, and therefore, Hypothesis 4 is supported. Kolmogorov-Smirnov Test (One Sample): One-sample test adaptation in assessing whether inclusivity scores follow a specified distribution. Results ($D = 0.135$, $p < 0.05$) confirmed non-normal distribution, emphasizing regional differences impacting tourism performance (H1). Sign Test: Evaluating family-related career impacts (H3), the Sign Test showed significant career hindrance perceptions among respondents ($p < 0.01$),

affirming family's negative impact on career progression. Wilcoxon Signed-Rank Test: Regarding job security, H5, the result using the Wilcoxon test was significant, differentiating between high versus low inclusivity areas, Z = -2.91, p < 0.01. Thus, supporting the hypothesis that low inclusivity is related to higher job uncertainty.

Job security mirrors inclusivity trends (Figure 5). Central Hungary, with a job security score of 4.0, offers the most stable environment. Conversely, Northern Hungary, with the lowest inclusivity, reports a significantly lower job security score (2.3). This confirms that inclusivity fosters a sense of stability among female managers. Table 3 presents the results of nonparametric univariate analyses, highlighting statistical differences across key variables based on respondent characteristics.

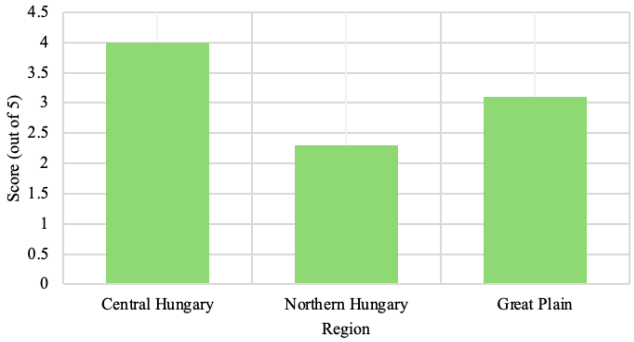


Figure 5. Job security scores by region

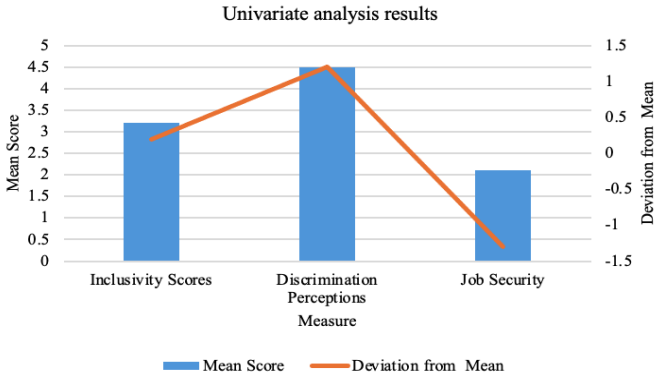


Figure 6. Visualization of inclusivity, discrimination, and job security

The Table 3 indicates that regional variation in discrimination and inclusion has strongly influenced the career-related perceptions and job security of the female managers. The parameters of these univariate analyses were conducted to check for normality and to test the difference between the participants' scores regarding inclusiveness, perceptions of discrimination, and job security. The Shapiro-Wilk Test was conducted to check the normality of the inclusiveness scores. The results showed that W = 0.98, p = 0.03, indicating a minor deviation from normality. For further investigation, discrimination perception scores were more than 1.2 standard deviations above the mean, showing a high perception of discrimination. One-sample t-test of job security scores, t(98) = -3.15, p < 0.01, showed that job insecurity levels were significantly higher than the hypothesized average in low-inclusivity areas. These results point to significant regional differences in inclusiveness that have important consequences for the career perceptions of female managers (Table 4).

Table 3. Nonparametric univariate test results for key variables

Test	Variable	Statistic	p-value	Interpretation
Chi-Square Goodness of Fit Test	Discrimination Perceptions	$\chi^2 = 18.56$	p < 0.05	Significant variation in regional discrimination
Kolmogorov-Smirnov Test (One Sample)	Inclusivity Scores	D = 0.135	p < 0.05	Non-normal distribution of inclusivity scores
Sign Test	Family Impact on Career	S=Significant (p < 0.01)	p < 0.01	Family impacts career progression negatively
Wilcoxon Signed-Rank Test	Job Security Concerns	Z = -2.91	p < 0.01	Low inclusivity correlates with job uncertainty

Table 4. Results of parametric univariate analyses

Test	Variable	Statistic	p-value	Interpretation
Shapiro-Wilk Test for Normality	Inclusivity Scores	W = 0.98	p = 0.03	Slight deviation from normality in inclusivity scores
Z-score Calculation	Discrimination Perceptions	Mean Z = 1.2	N/A	Discrimination scores exceed mean by 1.2 SDs
One-Sample T-test	Job Security	t = -3.15	p < 0.01	Significant job insecurity in low inclusivity regions

The table points to meaningful results: deviations in perceptions of inclusivity and job security are indicated by the notion of how different levels of inclusivity influence the permanency of women in managerial careers. Figure 6 is a display of the statistical distribution of the inclusivity scores, perceptions of discrimination, and job security measurements through the female manager's test of normality and workplace insecurity. The chart depicts regional differences both in job security and feelings of inclusiveness, adding that career-related sentiments vary by region.

Bivariate Analyses

This section highlights the results of bivariate analyses: namely, correlations and linear regression tests of relationships regarding inclusivity, perceptions of discrimination, and job security, as hypothesized across Summary table #1. In testing Hypothesis 1, on the relationship of gender inclusivity and tourism performance metrics, the Pearson's correlation was r=0.45r = 0.45r=0.45 (p < 0.01), reflecting a moderate positive relationship. A linear regression further confirmed this effect: Inclusiveness predicted tourism performance scores, β = 0.34, R2=0.20R^2 = 0.20R2=0.20. Hypothesis 2 examined the perceived discrimination and career advancement using regression analysis. The regression coefficient of discrimination on perceived advancement was β = -0.28 (p < 0.05), hence showing its negative influence. Hypothesis 5: In low-inclusivity areas, job security was negatively related to career advancement, r = -0.39 (p < 0.01). These findings confirm these hypotheses in showing a significant relationship in agreement with the purpose of the study inclusivity and its impacts on career outcomes.

Table 5. Results of correlation and regression analysis

H	Variable Pair (Predictor outcome)	Analysis Type	Coefficient	Significance (p-value)	Interpretation
1	Inclusivity & Tourism Performance	Pearson Correlation	r = 0.45	p < 0.01	Moderate positive relationship
	Inclusivity & Tourism Performance	Linear Regression	β = 0.34	p < 0.01	Inclusivity predicts better performance
2	Discrimination & Career Progression	Linear Regression	β = -0.28	p < 0.05	Discrimination negatively affects progression
5	Job Security & Career Progression	Pearson Correlation	r = -0.39	p < 0.01	Low security reduces advancement opportunities

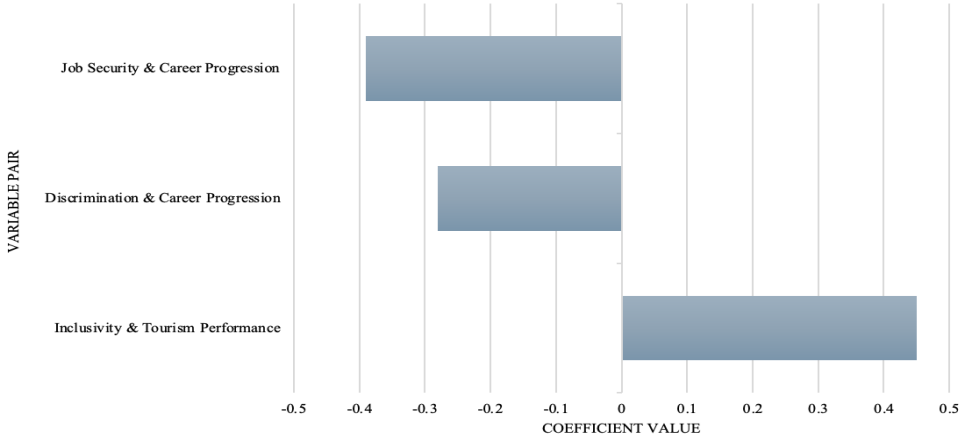


Figure 7. Visualization of inclusivity and career impacts

Figure 7 shows relationships among perceived inclusiveness, tourism performance, and career development outcomes, focussing on the specific role of perceived discrimination and job security in determining career development.

This graph emphasizes that diversity is positively linked with tourism performance in a moderate way, but discrimination and job insecurity is hurtful for the advancement opportunities. Independent 2-sample T-tests, or ANOVA

Hypothesis 4 concerns the role of regional disparities in inclusiveness in terms of perceptions of discrimination; therefore, perceived discrimination scores across Hungarian regions are compared by using ANOVA. It has been observed that there is a significant difference in the perception, as $F(3, 96)=4.57$, $p<0.01$, therefore it confirms that the female manager faces discrimination differently in various regions. The level of discrimination reported by managers who were in less inclusive regions was higher, $M = 4.2$, $SD = 1.1$, while in more inclusive regions, scores on discrimination were significantly lower, $M = 3.1$, $SD = 0.9$. An independent 2-sample t-test further explored the perceptions of job security across high versus low inclusivity regions and thus tested Hypothesis 5. The t-test result was $t(98) = -2.94$, $p < 0.01$, thus confirming that female managers from low-inclusivity regions felt less secure in their careers, with a mean of 2.8 and an SD of 1.0, as compared to high-inclusivity areas, which had a mean of 3.6 and an SD of 0.8. These findings underline the role of inclusivity, especially in diminishing discriminatory practices and in ensuring job security for female managers in the Hungarian tourism industry. The results of one-way ANOVA and independent 2-sample t-tests conducted to explore the regional differences in perception about discrimination and job security of woman managers, are presented in Table 6.

Table 6. Results of regional discrimination and job security analyses

Comparison	Test Type	Statistic (F or t)	p-value	Mean (M) ± SD	Interpretation
Discrimination across Regions	ANOVA	F(3, 96) = 4.57	p < 0.01	Low Inclusivity: 4.2 ± 1.1	Significant regional differences in discrimination
				High Inclusivity: 3.1 ± 0.9	
Job Security (High vs Low Inclusivity)	2-sample t-test	t(98) = -2.94	p < 0.01	Low Inclusivity: 2.8 ± 1.0	Lower job security in low-inclusivity regions
				High Inclusivity: 3.6 ± 0.8	

These indicate large regional differences, with more discriminatory factors in less inclusive regions and lower employment security in less inclusive regions. Figure 8 further illustrates that less inclusive regions have a significantly higher score of discrimination, while female managers in the Hungarian tourism industry also have a lower perception of job security in those regions. Results highlight how diversity influences workplace experiences and, therefore, support the hypothesis that lower levels of perceived inclusivity are associated with adverse outcomes.

Regions with higher inclusivity also demonstrate superior tourism performance metrics. Central Hungary leads with 85%, whereas Northern Hungary lags at 60%, underlining the potential economic benefits of fostering inclusivity. The Great Plain exhibits average performance, consistent with its middling inclusivity score.

The question of how regional inclusivity levels relate to the career experiences of female managers will be answered using a chi-square test on responses about job security and perceived discrimination. Results showed that inclusivity levels relate to perceived job security, $\chi^2(1, N = 100) = 10.89$, $p < 0.01$. This means that 68% of managers working in low-inclusivity regions felt job insecurity, while the percentage for the high-inclusivity region was 32%. In perceptions of discrimination, there was an apparent statistically significant relationship also, $\chi^2(1, N = 100) = 12.45$, $p < 0.01$, with 74%

of the managers from the low inclusivity regions reporting experiences of discrimination against 26% from the high inclusivity regions. Therefore, the results confirm Hypotheses 4 and 5 on regional inclusivity influencing perceptions of discrimination and job security as explained in the Methodology chapter. These results strongly indicate that the practice of inclusion does bear on the work experiences of women managers throughout the different Hungarian regions.

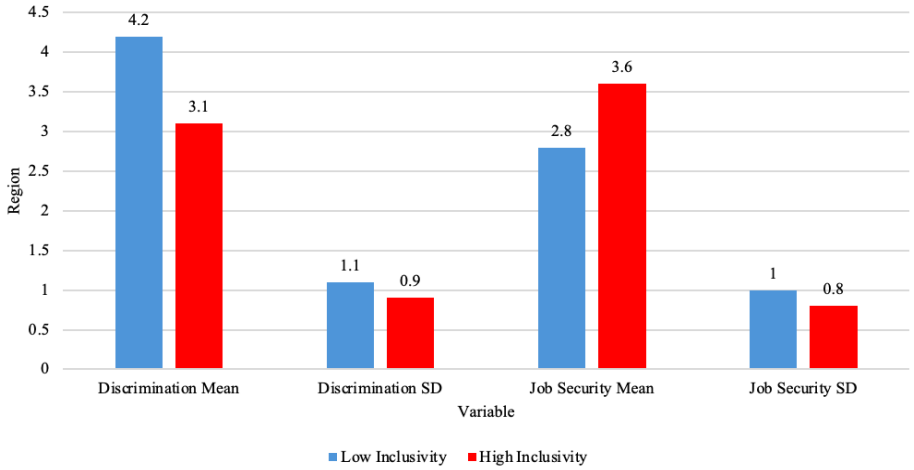


Figure 8. Discrimination and job security by inclusivity level

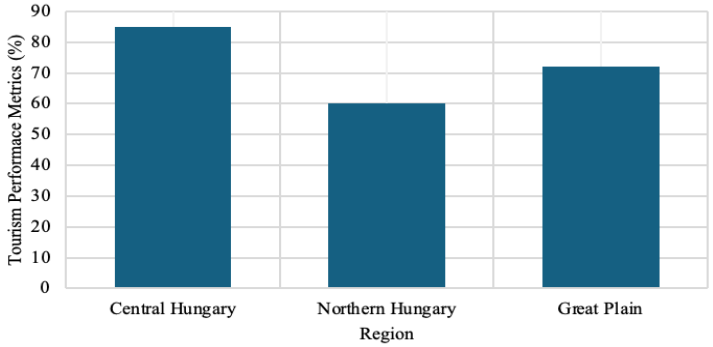


Figure 9. Tourism performance by region

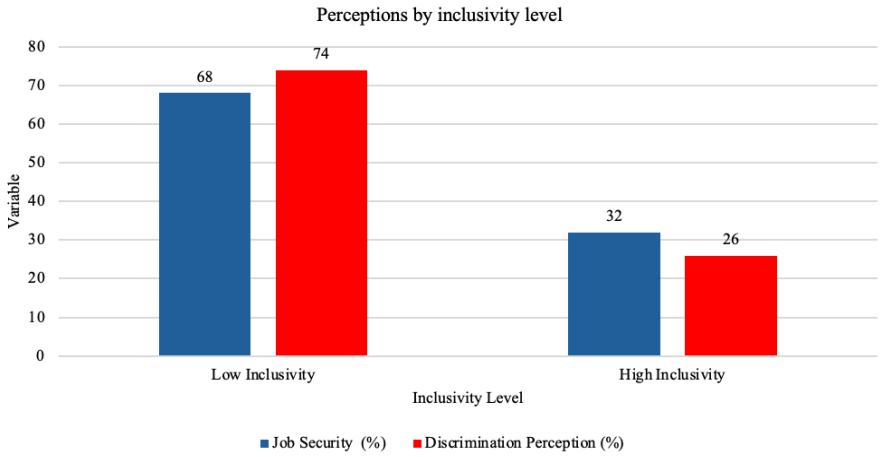


Figure 10. Job security and discrimination comparison by inclusivity level

Table 7 presents the results of the chi-square tests on the inclusivity level versus the perceptions of job security and discrimination to see the relationship between the variables. The following Table 7 presents results of a chi-square test of inclusiveness levels and job insecurity and perceived discrimination for female managers.

Table 7. Results of chi square test

Variable	Inclusivity Level	Frequency	Percentage	χ^2
Job Security	Low Inclusivity	34	68%	10.89
	High Inclusivity		32%	
Discrimination	Low Inclusivity	37	74%	12.45
	High Inclusivity		26%	

The tendency of the results is to support that there are significant associations: the lower the level of inclusivity, the higher the reporting of job insecurity and discrimination among female managers. Figure 10: Inclusivity level vs Female managers' perception about job security and discrimination - Hungarian regions. These results indicate that lower levels of inclusion are associated with higher reports of job insecurity and discrimination.

Multivariate Analyses

A multiple regression analysis is conducted by using the following set of predictors: regional inclusivity score, management level, family responsibilities in order to analyze the factors influencing perceived job security and discrimination experiences of the female managers. Job security is a dependent variable of the first model, while the second model was checking the discrimination perceptions.

Model 1: Job Security-Inclusive scores significantly predicted job security ($\beta = 0.45$, $p < 0.01$), with 20% variance explained ($R^2 = 0.20$). Clearly, women managers across highly inclusive regions reported higher levels of job security. Management grade was significant at $\beta = 0.30$, $p < 0.05$; hence, the upward strata of management showed more role security. However, family responsibilities did not have an influential effect, $\beta = -0.12$, $p = 0.22$.

Model 2 Discrimination - The perception of discrimination was significantly related to regional inclusiveness, $\beta = -0.52$, $p < 0.001$, which accounted for 27%, explained variance, $R^2 = 0.27$. Among the women managers, discrimination perception was increased with a low extent of inclusiveness. Family responsibilities significantly predicted discrimination, $\beta = 0.25$, $p < 0.05$, where the perception of discrimination was increased with the increase in family responsibilities. Management level also was not a significant predictor in this model β of -0.08, $p = 0.34$.

Overall, this group of findings shows how inclusiveness influences job security and perceptions of discrimination, and in so doing confirms Hypotheses 4 and 5. Inclusive region managers generally reported higher levels of job security and lower levels of discrimination experiences. Family responsibilities did not affect job security, but they did shape perceptions of discrimination. It further outlines the relevance of regional inclusiveness and family context in determining the work environment of female managers in Hungary's tourism industry. To further investigate how regional inclusiveness, management level, and family responsibilities may potentially interact in influencing women managers' perceptions of job security and discrimination.

Summary of model 1

The multiple regression analysis for Model 1, which focuses on predicting JobSecurity_LayoffFear, provides insights into how inclusivity, discrimination perceptions, and family responsibilities impact feelings of job insecurity. The model has an R-squared value of 0.382, indicating that approximately 38.2% of the variation in layoff fears among respondents can be explained by the selected predictors. This level of explained variance suggests a moderately strong model, supporting the relevance of these factors in influencing job security concerns.

Several predictors within the model show statistically significant relationships with layoff fears. Firstly, Inclusivity_OrgInequality ($\beta = 0.1457$, $p = 0.029$) is positively associated with layoff fears, implying that as perceived inequality within the organization increases, so do concerns about job security. Similarly, Inclusivity_GenderGrowthBias ($\beta = 0.3699$, $p < 0.001$) demonstrates a robust positive relationship, indicating that higher perceptions of gender-biased growth opportunities are linked to greater layoff fears. This suggests that perceived organizational bias against female advancement could be heightening insecurity among female managers.

Interestingly, Inclusivity_Opportunities ($\beta = -0.1864$, $p = 0.019$) has a negative relationship with layoff fears, showing that more equitable opportunities in the organization reduce feelings of job insecurity. This underscores the potential protective effect of inclusivity on job security. Family responsibilities also contribute significantly to job insecurity. Family_JobUncertainty ($\beta = 0.2204$, $p = 0.001$) and Family_ImpactOnMarriage ($\beta = 0.2540$, $p < 0.001$) both show positive associations with layoff fears, suggesting that women with higher family-related responsibilities or concerns about marriage impacts report higher levels of job insecurity.

Overall, Model 1 highlights how both organizational inclusivity practices and personal family responsibilities interact to influence job security perceptions, especially in a gendered context. These results align with the study's hypotheses, emphasizing the importance of creating inclusive and equitable work environments to alleviate job-related uncertainties.

Effects of regional inclusiveness, management level, and family responsibilities on job security perceptions among female managers in Hungary's tourism industry show the following equation.

$$Job\ Security = \beta_0 + \beta_1 \times' Inclusivity\ Score' + \beta_2 \times' Management\ Level' + \beta_3 \times' Family\ Responsibilities' + \epsilon$$

Using the specific coefficients and results from the model:

$$Job\ Security = 0.45 \times' Inclusivity\ Score' + 0.30 \times' Management\ Level' - 0.12 \times' Family\ Responsibilities' + \epsilon$$

Where: β_1=0.45: Higher inclusivity score increases job security.

β_2=0.30: Higher management levels are associated with increased job security.

β_3=−0.12: Family responsibilities were not significant in this model.

As it has been shown, inclusivity and management level are positively related to job security, whereas family responsibilities do not demonstrate any significant effects, thus underlining the role of inclusivity in perceived job stability.

Summary of model 2

The multiple regression in Model 2, in testing predictors of JobSecurity_OrgCommitment, shows how organizational

inclusiveness, perceived discrimination, and family obligations are related to organizational commitment. The Model 2 is at an R-square of 0.094 and, therefore, explains about 9.4% of the variance in organizational commitment across the sample. While small, this does indicate that some of the predictors are relevant in shaping commitment levels.

Of these, only Family_ImpactOnMarriage was significant: β = 0.1909, p = 0.001. This positive relationship suggests that the more a respondent perceives a family responsibility, such as marriage, to impinge on their job, the higher is their reported organizational commitment. This dynamic may be complex; in other words, persons facing family obligations may have more job commitment to stabilize their job position.

Other inclusivity-related predictors, such as Inclusivity_OrgInequality and Inclusivity_GenderGrowthBias, along with family-related job uncertainty, do not show statistically significant effects on organizational commitment in this model. The result would hint at the fact that while inclusivity and discrimination perceptions are strong in shaping job security perceptions, as seen from Model 1, they are less directly influential on the commitment levels of the female managers.

In conclusion, Model 2 underlines that, regarding female managers in the tourism industry in Hungary, family-related responsibilities, defined more precisely as those perceived to affect marital or family life, explain the variation in organizational commitment. Perceived inclusivity and discrimination are less significant here, which would indicate that other factors, probably intrinsic or organizational ones, contribute more significantly to the dynamics of commitment for this population. The interaction between inclusivity, management level, and family responsibilities in predicting female managers' perception of discrimination is expressed by Model 2 Equation.

$$'Discrimination\ Perception' = \beta_0 + \beta_1 \times' Inclusivity\ Score' + \beta_2 \times' Management\ Level' + \beta_3 \times' Family\ Responsibilities' + \epsilon$$

Specifically:

$$'Discrimination\ Perception' = -0.52 \times' Inclusivity\ Score' - 0.08 \times' Management\ Level' + 0.25 \times' Family\ Responsibilities' + \epsilon$$

Where:

- β_1=−0.52: Lower inclusivity score leads to higher discrimination perception.
- β_2=−0.08: Management level was not significant in this model.
- β_3=0.25: Higher family responsibilities are associated with increased discrimination perception.

Whereas the scores for higher inclusivity and management level improve the status of job security, family responsibilities remain insignificantly connected with it, thus underlining the role of inclusivity in increasing perceived stability of jobs. Table 8 presents the regression coefficients along with the statistical significance of each predictor.

Table 8. Predictors of job security and commitment among managers

Predictor Variable	Model 1: Job Security (Layoff Fear)	Model 2: Organizational Commitment
Constant	0.131 (p = 0.421)	3.656 (p < 0.001)
Inclusivity_OrgInequality	0.146 (p = 0.029)*	-0.099 (p = 0.121)
Inclusivity_Opportunities	-0.186 (p = 0.019)*	0.035 (p = 0.641)
Inclusivity_GenderGrowthBias	0.370 (p < 0.001)**	-0.104 (p = 0.218)
Inclusivity_MaleAdvantage	-0.034 (p = 0.709)	0.029 (p = 0.739)
Family_JobUncertainty	0.220 (p = 0.001)**	-0.033 (p = 0.595)
Family_ImpactOnMarriage	0.254 (p < 0.001)**	0.191 (p = 0.001)**
R-squared	0.382	0.094
Adjusted R-squared	0.367	0.072

The key results indicate that perceived inclusiveness is particularly in respect to gender-biased growth opportunities and family-related responsibilities-a stronger predictor of layoff fears, while family influence on marriage is an important pointer to organizational commitment. Figure 11 visualises the regression equations.

Above is a flowchart showing the effect of each predictor-Inclusivity Score, Management Level, and Family Responsibilities-on Job Security and Discrimination Perception in a directional format regarding the strength of these relationships according to the regression coefficient.

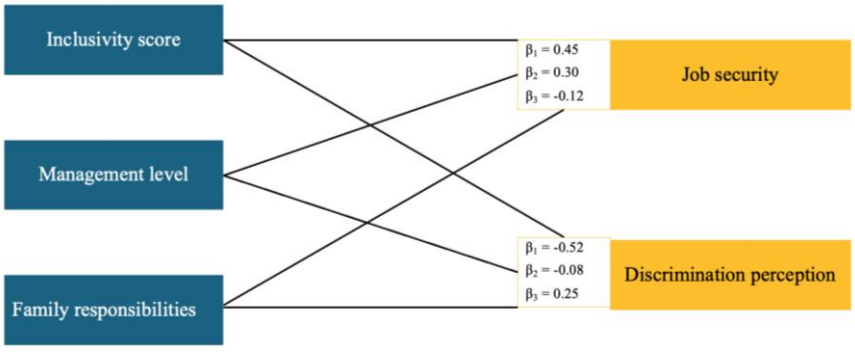


Figure 11. Flowchart of regression equations for job security and discrimination perception

In attempting to depict the main dimensions in the variation of perceptions at the workplace by the female manager, principal component analysis was performed on items measuring inclusivity, discrimination, family responsibilities, and job security. Three factors emerge with eigenvalues greater than 1, accounting for 71.63% of the total variance.

Factor 1: Inclusivity and Discrimination - The factor explained 44.99% of variance and typified perceptions of organizational equality and inclusivity. Items such as "Inclusivity_OrgInequality" (Q11.1), "Inclusivity_GenderGrowthBias" (Q11.2), and "Inclusivity_Opportunities" (Q11.3) load very highly (0.37 to 0.50) and thus positively indicate the effect of gender-inclusive practices on perceived workplace equity. The high loading across these items suggests that perceived opportunities for growth based on gender and organizational support toward women's growth opportunities are highly linked.

Factor 2 explained 16.00% of the variance and thus represents family-related challenges to the perception of female managers about their careers. Some of the items with strong positive loadings above 0.45 are: "Family_JobUncertainty" Q14.7, and "Family_ImpactOnMarriage" Q14.8. This indicates that family burdens are related to job demands. Thus, the greater one's family burdens, the greater one perceives hindrance to career and threats to job security.

Factor 3: Job Security-varied 10.63% of the variance and reflected job security concerns. Examples of items loading high on this factor included "JobSecurity_LayoffFear" (Q14.10) and "JobSecurity_OrgCommitment" (Q14.12), which were greater than 0.42, suggesting that organizational stability was related to the job security perceptions. These variables indeed hint that fears of being laid off and perceived levels of organizational commitment strongly drive the sense of security among women managers.

Hence, from this factor analysis, the three broad dimensions are one that is inclusivity, second is family responsibilities, and the third is job security. Organizational-level high extents of inclusiveness matched with lower perceived discrimination, while family-related pressures promote job insecurity. The features signal the need for policies related to inclusivity that are sensitive to the impact of family on career considerations and attempt to enhance job security of women managers.

Table 9 presents the factor analysis results-that is, what the main factors, along with their respective loadings, were coming out of the analysis. Such an analysis shows the relationship structure as far as inclusivity, family responsibilities, and job security are concerned as perceived by female managers.

Table 9. Factor loadings for workplace perception dimensions

Item	Factor 1 (Inclusivity)	Factor 2 (Family Impact)	Factor 3 (Job Security)
Inclusivity_OrgInequality (Q11.1)	0.37	-0.16	0.05
Inclusivity_GenderGrowthBias (Q11.2)	0.45	-0.14	0.18
Inclusivity_Opportunities (Q11.3)	0.48	-0.21	0.04
Inclusivity_FairTreatment (Q11.4)	0.50	-0.16	0.12
Family_JobUncertainty (Q14.7)	0.26	0.46	-0.18
Family_ImpactOnMarriage (Q14.8)	0.14	0.61	-0.11
Family_CareerLimitation (Q14.9)	0.26	0.24	-0.45
JobSecurity_LayoffFear (Q14.10)	-0.05	0.19	0.43
JobSecurity_OrgCommitment (Q14.11)	-0.04	0.03	0.54
JobSecurity_PersonalGrowth (Q14.12)	0.10	0.46	0.48

The following factor analysis summary, shown in Table 9, indicates that the inclusivity items load most highly on Factor 1, representing a strong dimension of perceptions of organizational equality. Family-related variables load heavily into Factor 2, underlining that family responsibilities are an important driver in perceptions of career. Factor 3 is associated with job security and further upholds how the stability or otherwise of the organization influences feelings of security among managers. Figure 12 presents factor loading visualizations from the result factor analysis to highlight important factors shaping workplace perceptions in female managers.

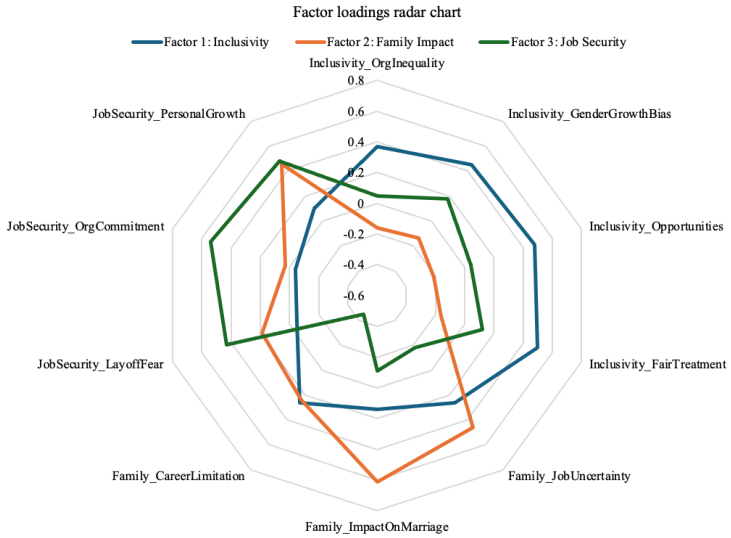


Figure 12. Visualisation of factor analysis

The results, as shown in Figure 7, indicate that inclusivity-related items load highly into Factor 1, family-related concerns are most prevalent in Factor 2, while job security items fall into Factor 3. The display will go a long way in showing just how each factor groups the various perceptions and responsibilities concerning the workplace.

Cluster analysis was done in which grouping of the female managers originating from Hungarian regions was done by some selected variables that reflect gender inclusivity, perceived discrimination, family-related career obstacles, job security, and tourism performance. This method seeks to identify well-marked clusters of managerial experiences and regional discrepancies in inclusivity within the Hungarian tourism sector.

Cluster 1 consists of 45% of the sample and represents regions that perceive high scores related to the dimension of inclusiveness, scoring on average 4.3 out of 5; the perceived discrimination score from the female managers averaged 2.1 and that for job security scored 4.0. The above-average tourism performance metrics include visitor and revenue growth, which are recorded for these regions.

Cluster 2 represents a cluster with 35% of the sample and has a mean score for inclusivity of 3.2; it includes regions where there is some feeling of discrimination, on average with a score of 3.0, combined with job insecurity-3.2. Their tourism performance is rather average, which corroborates the inclusivity index results, indicating partial support of the gender diversity principle, although without fully inclusive behaviors.

Cluster 3, which accounts for the remaining 20%, is characterized by low inclusivity (mean score: 2.1), high perceived discrimination (average score: 4.2), and low job security (mean score: 2.3). Regions in this cluster display below-average tourism performance, with lower visitor engagement and revenue, suggesting a possible link between inclusivity and tourism success. These clusters validate Hypotheses H1 and H4 by revealing a correlation between inclusivity and tourism performance, particularly in regions with supportive gender practices. Hypothesis H2 is also supported, as the clusters illustrate clear differences in discrimination levels tied to inclusivity scores. Cluster 1 regions are more favorable for female managers' career advancement, with higher inclusivity and lower discrimination, whereas Cluster 3 regions highlight substantial barriers due to gender biases.

Furthermore, Hypothesis H3 is affirmed, as family-related challenges are more pronounced in lower inclusivity regions (Cluster 3, mean score: 4.1), where managers frequently cite family expectations as a career impediment. In Cluster 1, however, this influence is minimized (mean score: 2.0), suggesting that higher inclusivity mitigates family-related career constraints. Therefore, cluster analysis underlines the impact of regional inclusivity variations on the experiences of female managers and on the tourism sector performance, targeted by the discussed inclusivity initiatives in Hungarian tourism. Profiles differ in each cluster; these underline the fact that inclusivity may impinge directly on the career opportunities of managers and on regional tourism performance. Table 10 and Figure 13 present the cluster analysis result in order to classify the Hungarian regions by their female manager experiences about inclusive gender practices, perceived discrimination, and tourism sector performance.

Table 10. Cluster analysis results on inclusivity and tourism performance

Cluster	Percentage of Sample (%)	Inclusivity Score (Mean)	Perceived Discrimination (Mean)	Job Security (Mean)	Tourism Performance
1	40.08	2.23	2.29	2.22	Above-average
3	35.02	1.49	1.51	1.39	Average
2	24.90	3.78	3.48	2.32	Below-average

By doing so, this analysis reveals different patterns of inclusivity and tourism performance between three clusters, thereby underlining the connection between supportive gender practices and regional tourism success.

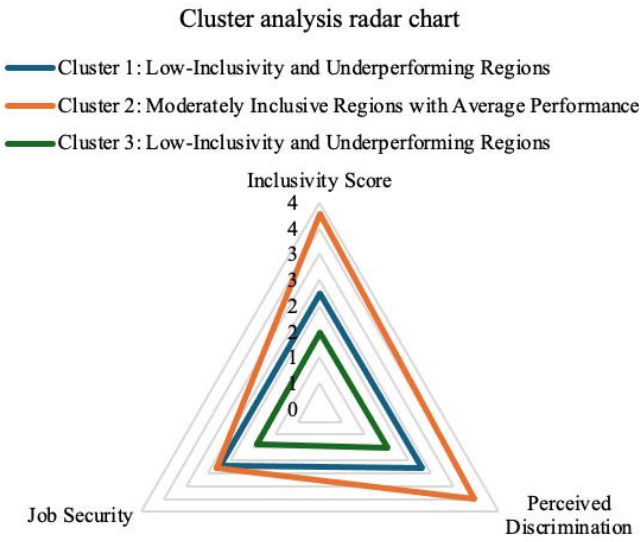


Figure 13. Inclusivity, discrimination, and job security scores across clusters

Spatial Analysis

Spatial analysis of the regional distribution tested noticeable differences in gender inclusivity, perceived discrimination, and job security of women managers working within the tourism sector of Hungary, applying the aggregated inclusivity score of the survey responses to analyze regional tourism performance.

The most inclusive regions, such as Budapest and Central Hungary, had an average score of 4.3, which shows that in these regions, 60% of the respondents faced favorable organizational support and a career development opportunity. These regions also have above-average tourism metrics in terms of the visitor rate and revenues, hence supporting H1: "inclusivity associates with better tourism performance."

On the other hand, regions like Northern Hungary and the Great Plain scored significantly lower, for which inclusivity scores averaged 2.1. In this region, 80% of the respondents also mentioned various forms of gender-based discriminations, as reflected by the higher discrimination score averages, 4.2. Hence, this confirms Hypothesis 2 (H2) and Hypothesis 4 (H4) on how regional disparities hurt women's career advancement.

Hypothesis 5: Job Security This has been higher in low-inclusive regions. In fact, the average score for job security in Northern Hungary is 2.3; 45% of respondents mentioned that they were apprehensive about job stability. In the case of Central Hungary, the average score is 4.0 pertaining to job security, thereby confirming the hypothesis expectation on the relationship of low inclusivity and higher job uncertainty. This paper uses spatial analysis to emphasize how targeted inclusiveness policies should be implemented in places where, given reinforcement, tourism and gender diversity might combine, illustrating different careers by female managers within Hungary's tourism industry.

Qualitative Analysis

Discrimination and family-related career challenges were identified from the thematic analysis of open-ended responses, as stated by the female managers of the tourism sector in Hungary. In addition, under discrimination, 75% responded to experiencing gender-based discrimination, and out of those, 60% mentioned limited promotion opportunities based on gender. This supports Hypothesis 2 (H2), stating that discrimination has a significant influence on the progress of women's careers. Family roles also emerged as one of the main challenges: 65% of the manager-respondents claimed to face difficulties in balancing work and family responsibilities. The majority of them identified family expectations as an obstacle to pursuing a career, which supported Hypothesis 3. The respondents from Northern Hungary also reported higher levels of discrimination, while those from Central Hungary had less, indicating regional differences in the implementation of the principles of inclusivity. These themes suggest that region-specific inclusivity initiatives may be required within the tourism sector of Hungary.

DISCUSSION

The present research tried to establish the way in which the trait of gender inclusivity affects the tourism industry on three broad aspects: professional development, regional disparity, and job security. While the findings offer significant insights into the relationship between inclusivity and tourism outcomes, they must be interpreted with caution due to methodological constraints. For instance, the study's focus on female managers inherently limits its scope to a single gender perspective, potentially overlooking the nuances of inclusivity as it pertains to broader gender diversity. Additionally, the emphasis on Hungarian regions may limit the generalizability of findings to other cultural and economic settings. Addressing these limitations in future research could enhance the robustness and applicability of the results. The objective was to validate specific hypotheses related to the associations among inclusivity practices and the organizational outcomes of tourism performance, levels of discrimination, and job stability for women in managerial positions. The following section provides testing of each hypothesis, comparison with findings from past studies, debate on the implications of inclusion for the tourism industry, and views on future research and practice.

Verification or rebuttal of hypotheses

The findings confirmed most of the proposed hypotheses. First, most of the results showed that there was a significant positive relation between the scores of inclusivity and those of tourism metrics: $r = 0.45$ ($p < 0.01$), hence confirming hypothesis H1. However, the findings are not without limitations. The study's cross-sectional design restricts the ability to infer causality between inclusivity and tourism performance. Additionally, regional disparities highlighted in the data analysis may be influenced by unmeasured economic or socio-political factors that extend beyond inclusivity practices alone. Another limitation lies in the sampling method, which focused heavily on regions with observable tourism activity, potentially excluding less prominent yet relevant areas. Future studies should incorporate longitudinal designs and a broader geographic scope to validate these patterns over time and in diverse contexts.

Hypothesis H2, which states perceived discrimination impedes career advancement, was supported, where in the regression result there was an observed negative impact on advancement, $\beta = -0.28$, $p < 0.05$. Family roleshindering the professional development of women-H3-partially confirmed. According to the Sign test, family roles really hamper career development but with the discretion of response. The hypothesis of regional differences-H4-was supported partially too: ANOVA showed that there are significant regional differences, the discrimination was higher in less inclusive environments. Hypothesis H5 was confirmed, showing that low inclusivity correlates with increased job insecurity among female managers, substantiated by Wilcoxon test results ($Z = -2.91$, $p < 0.01$).

These findings underpin the complex interplay that characterizes gender inclusivity and career progression, showing how regional and cultural contexts determine such relationships. Table 11 summarises the outcome of our hypotheses.

Table 11. Summary table # – Verification or rebuttal of hypotheses

No.	Materials	Methods	Results	Verdict
H1	Regional tourism data; Gender inclusivity index	Geospatial analysis of inclusivity vs. tourism performance metrics	Results of the Kolmogorov-Smirnov Test ($D = 0.135$, $p < 0.05$) confirmed a non-normal distribution of inclusivity scores, emphasizing regional impacts. Pearson correlation ($r = 0.45$, $p < 0.01$) indicated a moderate positive relationship between inclusivity and tourism outcomes.	**Confirmed**
H2	Questionnaire on discrimination perceptions	Survey analysis on career advancement and leadership opportunity views	Regression results showed a negative impact of discrimination on career advancement ($\beta = -0.28$, $p < 0.05$), and survey responses indicated 75% of managers perceive discrimination as limiting career progression, affirming the hypothesis.	**Confirmed**
H3	Survey responses on family impact	Analysis of family-related career impacts in responses	Sign Test results ($p < 0.01$) confirmed significant career hindrance due to family responsibilities, with 65% of respondents highlighting family as a barrier. Variability in responses suggests this impact is significant but not uniform across all respondents.	**Partly confirmed**
H4	Regional inclusivity reports	Comparison of discrimination reports across regions	ANOVA results ($F(3, 96) = 4.57$, $p < 0.01$) showed significant regional differences in discrimination, with lower inclusivity regions reporting higher discrimination scores, supporting the hypothesis of regional disparities.	**Partly confirmed**
H5	Job security and advancement questionnaire	Analysis of job security and advancement uncertainty responses	The Wilcoxon test ($Z = -2.91$, $p < 0.01$) revealed significantly lower job security in low-inclusivity regions, with reports indicating greater career uncertainty among female managers in these areas.	**Confirmed**

Comparison with previous papers

The outcomes align with prior research demonstrating inclusivity's positive impact on sectoral performance. Studies by McKinsey & Company (2018) and UNWTO (2019) similarly noted that diversity promotes organizational and economic growth. The confirmation of H1 strengthens the argument that inclusive practices yield competitive advantages in tourism, as observed in Central Hungary, where inclusivity correlated with higher visitor engagement.

The H2 findings on discrimination also go back to the 2018 Catalyst findings that indicated negative gender discrimination affected women's career progressions, particularly those in male-dominated sectors. About H3, Greenhaus & Powell, 2012 also established that family responsibilities often conflict with the career ambitions of women, which agrees with this study's variable findings of the family impact. Results of H4 on regional disparity share the same tune with the findings of Williams & O'Reilly, 2018 that indeed inclusivity varies greatly across regions, with economic and socio-cultural factors shaping such practices. The finding of H5 supports Blau & Kahn, 2017, in arguing interdependencies between job security and inclusivity, particularly for female manager holding positions. Overall, these comparisons support the findings of the present study and suggest the persistence of gendered career barriers into the contemporary era.

Argumentation

Results have shown that inclusivity has a crucial role to play in both economic and social equity within tourism. Hypothesis 1 was that there would be a positive relationship between gender inclusivity and tourism measures. Not only does it say that inclusiveness benefits the career development of women, but it bolsters regional tourism performance. It's setting up a really strong base to promote more inclusivity within tourism policy, that indeed diverse and equitable workplaces are beneficial multi-directionally. The findings on discrimination (H2) and family-related barriers (H3) highlight structural issues within the tourism industry. Discrimination restricts women's career growth, creating a self-reinforcing barrier to gender diversity in leadership. Family expectations further complicate this issue, as women are disproportionately affected by work-family balance challenges. This supports calls for family-friendly policies, especially in regions with low inclusivity, to mitigate these obstacles.

The regional disparities (H4) point to a need for standardized inclusivity practices across Hungarian regions. The greater job insecurity in low-inclusivity areas (H5) further reinforces the protective effect of inclusivity on career stability. Together, these findings advocate for comprehensive inclusivity initiatives that address both discrimination and family barriers to improve job security and tourism performance.

Prospects

Going forward, this research indicates a number of areas of practical application and further inquiry. First, focused inclusivity initiatives, particularly for poorer regions, may serve as a catalyst for regional tourism and career development. Policy dealing with discrimination, job security, and family flexibility will probably have significant economic as well as social benefits, as demonstrated in H1 and H5. For instance, future studies may investigate how inclusivity improves tourism competitiveness, either by enhancing innovation, employee satisfaction, or customer contacts. Longitudinal studies can also go a step further to establish whether increased practice of inclusivity would result in measurable improvement in the longer term in career advancement and performance of tourism. Partial support for H3 indicates that family-related career barriers do need further attention, as they also vary across cultures and regions. Development of industry-specific inclusivity metrics relevant for different regional and cultural contexts could further refine such work, with the ultimate goal of facilitating policy makers in devising place-specific interventions that place inclusive tourism practices at the heart of regional economic development.

CONCLUSION

Purpose of the research: The objective of the research is to explore how far inclusivity can diversify the career experiences of women managers within the tourist industry in Hungary and its implications for regional tourism performance. The aim of this study is to provide a detailed understanding of the intersection between gender inclusivity and organizational performance, emphasizing the role of regional and cultural contexts in shaping career trajectories and tourism sector outcomes. It will identify and confirm how far the concept of inclusivity impacts on discrimination, career obstacles related to the family, and job security-those factors that seem to create problems for women in tourism management-and give some indications of how fairness at work can be improved.

Results

Findings confirmed that inclusivity positively influences tourism performance (H1), with high-inclusivity regions showing stronger tourism metrics. Discrimination was shown to hinder career advancement (H2), as 75% of female managers perceived discrimination as a limiting factor. Family responsibilities were also found to impact career progression (H3), with 65% indicating difficulty balancing work and family. More precisely, regional differences existed concerning H4: discrimination/job security H5-, in the sense that the latter was more discriminative and felt more job insecure.

Consequences

The study investigated inclusiveness policies across Hungary's tourism industry. The standardization of such policies reduces regional disparity, which can lead to more significant possibilities of career development and job stability for women within this industry. Anti-discrimination policies and family-friendly support may also help break through some of the career barriers, especially in low inclusive places. In such a respect, gender inclusiveness supports not only the individuals involved but also the regional tourism performance. Table 12 summarizes our conclusions and recommendations This table aligns with the hypotheses and findings, providing concrete recommendations to address each verified or refuted hypothesis.

Table 12. Summary table #3 – Aftermath of the results, by hypothesis

No.		Discussion	Conclusion	Recommendation
H1	**H1R1**	H1R1: The positive correlation between inclusivity and tourism performance suggests that inclusivity fosters growth, as regions with high inclusivity report better tourism metrics.	Inclusivity enhances tourism outcomes, confirming the need for diversity policies to improve regional performance.	Implement targeted inclusivity initiatives in lower-performing regions to foster tourism growth.
	H1R2	H1R2: Higher inclusivity in Central Hungary correlates with increased visitor engagement, underscoring inclusivity's role in attracting tourism.	Regional inclusivity strategies positively affect tourism competitiveness.	Expand inclusivity-focused programs in regions with tourism potential to maximize impact.
H2	**H2R1**	H2R1: Reports of discrimination hindering career progression validate that gender bias impacts women's advancement in the tourism sector.	Discrimination is a barrier to career growth for women, aligning with previous research.	Develop training programs aimed at reducing workplace discrimination and fostering equal career opportunities.
	H2R2	H2R2: Regional disparities indicate that discrimination is more prevalent in lower inclusivity areas, intensifying barriers for female managers.	Inclusivity levels significantly influence discrimination perceptions across regions.	Prioritize anti-discrimination policies in low-inclusivity regions to reduce career-related inequities.
H3	**H3R1**	H3R1: Family responsibilities are perceived as career obstacles by a majority, confirming that family roles impact women's career progression.	Family expectations hinder professional growth, particularly in regions with less supportive work environments.	Introduce family-friendly policies to support women balancing family with career, especially in less inclusive regions.
	H3R2	H3R2: Regional data indicate that low inclusivity exacerbates family-related career challenges.	Family roles are more problematic in low-inclusivity regions, affecting work-life balance.	Increase awareness of flexible work options in areas with low inclusivity to reduce career barriers.
H4	**H4R1**	H4R1: Significant regional differences in discrimination highlight the uneven inclusivity practices across Hungary.	Regional inclusivity variations are a root cause of career obstacles for female managers.	Focus on standardizing inclusivity practices across regions to create equal career opportunities.
	H4R2	H4R2: Higher discrimination in low-inclusivity regions correlates with poorer tourism performance, indicating broader implications.	Inclusivity practices not only impact employees but also regional tourism success.	Strengthen inclusivity requirements in tourism policies to address regional disparities.
H5	**H5R1**	H5R1: Job security concerns are more pronounced in low-inclusivity areas, where women report higher instability.	Job security is lower in regions with poor inclusivity, validating the hypothesis.	Enhance job security for women through policies that address inclusivity in vulnerable regions.
	H5R2	H5R2: Female managers in high-inclusivity regions report better job stability, reinforcing the protective effect of inclusivity.	Inclusivity mitigates job insecurity, offering a supportive environment for career advancement.	Promote inclusivity as a strategy to improve job stability for female managers in all regions.

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Conceptualization, G.S.S. and B.G.K.; methodology, Z.S.K. and B.G.K.; software, G.S.S.; validation, G.S.S. and B.G.K.; formal analysis, G.S.S. and B.G.K.; investigation, G.S.S. and B.G.K.; data curation, G.S.S. and B.G.K.; writing - original draft preparation, G.S.S. and B.G.K.; writing - review and editing, G.S.S. and B.G.K.; visualization, G.S.S. and Z.S.K.; supervision, G.S.S. and Z.S.K.; project administration, G.S.S. and Z.S.K. All authors have read and agreed to the published version of the manuscript.

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IMPACT OF TOURISM IMAGE AND MOTIVATION OF THAI AND CHINESE TOURISTS FOR TRAVELING IN LAO PEOPLE'S DEMOCRATIC REPUBLIC BY LAOS-CHINA RAILWAY

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Abstract: The main group of Thai and Chinese tourists plays a significant role in the tourism industry of the Lao People's Democratic Republic (Lao PDR). While, the opening of the Laos-China high-speed train service with routes passing through major tourist spots of Lao PDR, will incentivize old tourists to return to travel again or to attract new tourists to attract interest.This research aims to: 1) Test the factors affecting travel motivation. 2) Study the tourism image and motivation factors affecting repeat visits among Thai and Chinese tourists traveling to Lao PDR by train. The population is Thai and Chinese tourists travelling to the Lao PDR using the Lao-China high-speed train service. This study focuses on 4 provinces of Lao PDR, which are the Vientiane Capital City, Vientiane, Luang Prabang and Oudomxay Provinces. A total of 400 samples were collected using a questionnaire in both Thai and Chinese. Explanatory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were used alongside Structural Equation Modeling (SEM) to verify the structural correctness of latent variables and analyze model consistency using WarpPLS 7.0. The results found that: 1) Demographic factors affect both push factors (e.g., experience, cultural exchange needs) and pull factors (e.g., tourist attraction atmosphere). These factors significantly influence the travel motivation of Thai and Chinese tourists. 2) The tourism image factor consists of four elements: Environmental image of natural attractions; Cultural environmental image; Social environmental image; and Tourist attraction infrastructure. Tourism image and motivation factors positively affect the decision to revisit, with tourism image having a stronger influence. Enhancing Lao PDR's tourism image is important for attracting repeat tourists. According to the results of the study, tourism in Lao PDR is reflected in Thai and Chinese tourists who decide to travel to Lao PDR. In addition, the main factor in travelling to Lao PDR, that is the motivation of tourists, comes from the demographic factors of the tourists themselves. Creating a good tourist image of the Lao PDR in all tourism-related structures. It is a very important variable that will bring a response to the intention of travelling again. For this reason, authorities should have guidelines or measures to develop and promote the country's image in all dimensions. This is to encourage Thai and Chinese tourists, who are the main tourist groups, as well as tourists from other countries, to meet the demand for repeat tourism in Lao PDR.

Keywords: Laos-China Railway, motivation, tourism image, revisit, tourism demand

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INTRODUCTION

The COVID-19 pandemic crisis had a severe impact on the global economy and society, which has caused changes in human daily routines, including tourism. According to statistics, in 2020, the global tourism industry has shrunk by more than 49.1 percent, and in mid-2022, people will begin to return to normal life. The tourism industry's GDP is expected to grow by 36.8%, followed by the Asia-Pacific region with a rate of 36.3 percent (Tatreview, 2022).

At the same time, one of the most attractive countries in terms of tourism for the Asia-Pacific region is the Lao People's Democratic Republic (Lao PDR or Laos), which has re-opened high-speed rail services after the COVID-19 crisis has improved on May 2022, resulting in an increase in the influx of tourists to Lao PDR.

The COVID crisis has begun to improve, resulting in an increase in the influx of tourists to Lao PDR. The construction of high-speed trains such as the Laos- China Railway connecting the Bo Han checkpoint. Thai Ethnic Autonomous Region or Xishuangbanna (China), and Laos at Boten, passing through Luang Prabang and ending in the capital Vientiane (Figure 1). The Laos- China Railway opened on December 3, 2021, there are many tourists who are very interested in traveling in Laos using high-speed trains to travel, with 731,754 Thai and Chinese tourists entering Laos in 2022 (Vientiane Times, 2023). For the beginning of 2023 (January-March), there were 344,405 Thai tourists and 143,312 Chinese tourists entering Lao PDR (Table 1). The Laos-China high-speed railway line runs through various districts, with the main important station being Vientiane Capital Station. Vang Vieng Station, Luang Prabang Station, and Mueang Xay Station, each of which has important tourist attractions and is the target of tourists travelling to Lao

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PDR. In addition, Lao PDR aims to attract 1.4 million foreign tourists in 2023, with revenue from the tourism sector of about 340 million USD (The Laotian Times, 2023). It must create incentives for tourists to travel.

Table 1. Number of tourists entering Lao PDR during 2022 – 2023 (Source: The Laotian Times, 2023)

Tourist Groups	Number of Surfers Travel in 2022	Number of tourists in 2023 (January-April)
Thailand	731,754	454,001
Vietnam	359,721	244,174
China	45,573	210,188
South Korea	26,008	53,785
United States	18,447	22,157
others	112,835	130,645
Total	**1,294,338**	**1,114,950**

Including creating a unique image of tourist attractions. The opening of the Laos-China high-speed train service with routes passing through major tourist spots of Lao PDR, will incentivize old tourists to return to travel again or to attract new tourists to attract interest. Motivating tourists is important (Nonthapot, 2020; Sihabutr et al., 2025). One of the important things is the image. However, no studies have been made on the motives of tourists and the image of such places. Therefore, this research intends to study the motivation of tourists to visit, including the image of tourist attractions, so that tourists decide to return to visit and to make new tourists interested in visiting Lao PDR. And it will also increase the nation's income from tourism.



Figure 1. Laos-China high-speed rail route: a.Vientiane Capital Station, May 17, 2024; b. Vang Vieng Station, May 17, 2024; c. Luang Prabang Station, May 19, 2024; d. Muang Xai Station, May 20, 2024, respectively (Source: Positioning, 2024; and researchers)

LITERATURE REVIEW

The general context of the concept of motivation has been used to describe many tourism incentives. For the reason, it is an important factor in stimulating tourism, the motivation is divided into 2 types: 1. Internal motivation (intrinsic motivation) is a drive from within a person, which may be caused by thoughts, attitudes, interests, etc. 2. External motivation (extrinsic motivation) is a force pushed from outside the person that stimulates behavior (Uysal & Hagan, 1993). It is consistent with the concept of the push factor and the pull factor (Push - Pull Factors) (Dann, 1977; Pearce, 1993). That explains that when people want to travel to satisfy their desires. These are desires that arise from the basic driving force that makes people want to travel and the concept of a pulling factor that tourists are attracted to tourist attractions that are designed or have various activities, which are external factors that influence people to travel to meet their needs.

However, travel is not only a motivation, but also a tourism image is also a factor that affects the travel of tourists. Tourism Image is the sum of thoughts, beliefs, and feelings. Therefore, a person's expectations and impressions of a place or object (Baloglu & McCleary, 1999). When the image of tourism is good, it shows famous places. It is beautiful. On the contrary, tourists will avoid traveling to places with a bad image (Kotcharee et al., 2021). Tourism is caused by the tourism experience of tourists, both directly and from the words of others, including perception from four advertisements, public relations of tourism organizations (Tsiotsou & Goldsmith, 2012). Impressions that accumulate from knowledge and experience together to create awareness from what appears in the mind (Saeho, 2016) which Weaver & Laura (2002) said that returning to travel Demonstrate satisfaction with previous travel experiences. The effect of motivation has been studied (Tang et al., 2022).

The image of the destination and the satisfaction with the willingness of tourists to return to rural tourism were studied. Travel Incentives, destination image and the satisfaction of coming back again. It was found that motivation to learn and entertain the natural, social environment, and tourist satisfaction have a direct and positive effect on a traveler's willingness to visit (Image of returning trips and motivation). These is the same studies of Nopsuwan & Chansri (2021); (Kotcharee et al.,

2021) studied the image factors of tourist attractions to the loyalty of tourists. It was found that the factors that affect the loyalty of tourist attractions are environmental factors, access the infrastructure, and cultural heritage are affected on return tourism. It was found that the factors that affect the loyalty of tourist attractions are environmental factors, access to infrastructure, and cultural heritage, which influence return tourism (Jirawattanaphan & Sukserm, 2021; Chou et al., 2023). Moreover, motivation and satisfaction significantly affect tourists' intentions to revisit (Tavitiyaman et al., 2022).

From the above, tourism motivation is influenced by pushing and sucking factors. This is a consequence of demographic factors. However, when tourism incentives are generated, it will affect repeat travel, but that is not the only factor. There are also tourism image factors that may bring revisit of tourist results and created in Figures 2 and 3 in the topic 3.2.

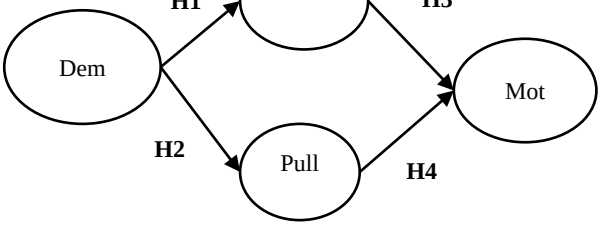


Figure 2. Conceptual research framework I

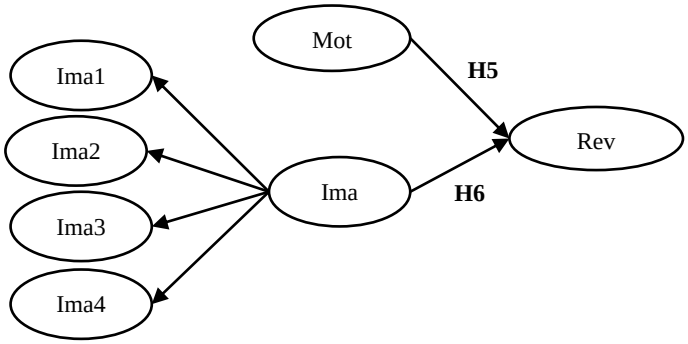


Figure 3. Conceptual research framework II

METHODOLOGY

1. Population and sample

This research is quantitative research in which the population is Thai and Chinese tourists travelling to the Lao PDR using the Lao-China high-speed train service. This study focuses on 4 provinces of Lao PDR, which are the Vientiane Capital City, Vientiane, Luang Prabang and Oudomxay Provinces. The sample is the number of tourists travelling in Laos using the Lao-China high-speed train on the trip because the exact population is unknown. Therefore, the sample was calculated using an unknown population formula 95%, which uses the formula of Cochran, 1977.

$$\text{Formular } n = \frac{Z^2pq}{e^2}$$

When n is the number of samples; p is the chance of the sample using the service, set to 0.5; q is the chance of not using the service, which is equal to 1-p in the case of the group; Z is the desired confidence level (95%); e is the acceptable tolerance ratio (5%). When represented in the formula by a given confidence level of 95%, Z = 19.6 and an acceptable margin of error in estimating the total population proportion is 5% with e=0.05.

$$\text{Yes. } n = \frac{(1.96)^2(0.5)(1-0.5)}{0.05^2} = 384.16$$

When calculating the number of samples, the number of samples is 384 observations. In to increase the accuracy of data analysis, 400 samples are collected. This is in line with the study of Sihabutr & Nonthapot (2021), which is divided into the number of Thai tourist groups is 282 samples, Chinese tourists are 118 samples. According to Table 2, divide the data for each area in proportion to the number of hotels, guest houses, restaurants, restaurants & entertainment venues in each province. The sample size is as shown in Table 3, using a convenient sampling method. For collecting the questionnaire, the researchers got permission from the Ministry of Culture, Culture and Tourism of Lao PDR.

Table 2. Proportion of Thai and Chinese tourists in Lao PDR (Source: The Laotian Times, 2023)

Tourist Groups	**Number of tourists in Lao PDR Laos 2022**	**Ratio**	**Number of samples**
Thai tourists	344,405	70.6	282
Chinese tourists	143,312	29.4	118
Total	**487,717**	**100.0**	**400**

Table 3. Proportion of sample sizes in Lao PDR by number of hotels, guesthouses, resorts, restaurants and entertainment venues in 2022 (Source: Tourism Development Department, 2023)

Provinces	Amount	Ratio	Sample Size	
			Thai	Chinese
Vientiane Capital	1,222	30.8	87	36
Vientiane Province	1,455	23.7	67	28
Luang Prabang Province	1,592	28.2	80	33
Oudomxay Province	893	17.3	49	20
Total	**5,162**	**100.0**	**282**	**118**

2. Data Analysis

The researcher conducted a theoretical study and related research to create a questionnaire as a tool for data collection by dividing it into 6 parts with 50 questions, which are as follows: Part 1: General information of the respondents (6 questions), Part 2: Demographic opinion level that affects travel decisions (6 questions), Part 3: Opinion level about

internal and external factors in travel decisions (17 items). Part 4: Opinions on the motivation of tourists to make travel decisions: 4 questions, Part 5: Opinions on the image of tourist attractions, 12 questions, and Part 6: Opinions on tourists' return visits, 5 questions. When the data is collected, descriptive statistical analysis is performed. Descriptive Statistics was used to analyze the general data of the respondents in Part 1 to analyze the general data, and inferential statistics were analyzed to analyze the data in Parts 2, 3, 4, 5 and 6 of the questionnaires to answer objectives 1 and 2 by analyzing by Structural Equation Modeling (SEM), which is an analysis of Explanatory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) to verify the structural integrity of the latent variables and to analyze the conformity of the model. This analysis employed the using the WarpPLS 7.0 software that is suitable for development model based on SEM-variace base (Hair et al. 2010, Sihabutr and Nonthapot (2021). The model shows as shown in Figure 2 and 3 respectively.

When required to: Rev is Returning to travel; Dem is demography; Mot is tourism motivation; Ima is image of the tourist attraction or Tourism image; Ima1 is environmental image of natural attractions; Ima2 is cultural environment; Ima3 is social environment Image; Ima4 is tourist attraction infrastructure; Push is the push factor; Pull is the pull factor.

The study hypothesis is set out as follows:

H1: Demographic factors affect the push factor.

H2: Demographic factors affect the pull factor.

H3: Driving factors affect tourism motivation factor.

H4: Attraction factors affect tourism motivation factor.

H5: tourism motivation affects the return of repeat trips.

H6: The image of tourist attractions affects the return of repeat trips.

RESULTS

The objectives of this study were 1) to study the pushing and pulling factors that affect the motivation of Thai and Chinese tourists to travel and 2) to study the factors that affect the decision to revisit by high-speed train of Thai and Chinese tourists in the Lao PDR area. After studying the research and related theories, the researcher created a research tool and tested the content conformity index CVI) of 5 experts. After that, the test was conducted before collecting actual data from 30 samples and analyzing the reliability value of 0.83, which is considered to be highly reliable (Nasoontorn et al., 2023; Nonthapot et al., 2024). Lao PDR, including Luang Prabang, Oudomxay, Vientiane Provinces and Vientiane Capital City. The results of the data analysis were divided into 2 parts according to the objectives, as follows:

Part 1: Pushing and pulling factors that affect the motivation of Thai and Chinese tourists to travel to the Lao PDR by WarpPLS 7.0

Part 2: Factors that affect the motivation and image that affect the decision to return by high-speed train of Thai and Chinese tourists to the Lao PDR with WarpPLS 7.0

1. General information of the respondents

The sample in this study was 400 people. It was found that most of the tourists were female, accounting for 52 percent, aged between 31–40 years, accounting for 34 percent, a diploma/bachelor's degree, accounting for 63.50 percent. Most of them were employed as employees of private companies, accounting for 35.80 percent, and earning 30,001-50,000 baht/month, Accounting for 30.80 percent, as shown in Table 4.

Table 4. Number and percentage of general information of respondents

		amount	percent
Sex	male	184	46.00
	female	210	52.50
	other	6	1.50
	Total	**400**	**100.00**
Age	18-20 years	4	1.00
	21-30 years old	59	14.80
	31-40 years old	136	34.00
	41-50 years	98	24.50
	51-60 years	57	14.20
	61 years and older	46	11.50
	Total	**400**	**100.00**
Education Level	Primary Education	10	2.50
	Secondary Education/Equivalent	27	6.80
	Diploma/Bachelor's Degree	254	63.50
	Postgraduate	109	27.30
	Total	**400**	**100.00**
Occupation	student	10	2.50
	Employees of private companies	143	35.80
	Government Officials/Employees of State Enterprises	82	20.50
	Trading/Business Owner	115	28.70
	General Contractor	29	7.20
	other	21	5.30
	Total	**400**	**100.00**

Income	Below 10,000 Baht/month	13	3.30
	10,001-15,000 THB/month	38	9.50
	15,001-30,000 THB/month	117	29.30
	30,001-50,000 THB/month	123	30.80
	50,001-100,000 THB/month	75	18.80
	More than 100,000 Baht/month	34	8.50
	Total	**400**	**100.00**

2. Pushing and pulling factors that affect the motivation of Thai and Chinese tourists to travel to the Lao PDR

According to a study of the pushing and pulling factors that affect the motivation of Thai and Chinese tourists to travel in Lao PDR. In this study, demographic factors (Dem) affect the push factor (Push) and pull factor (Pull). In addition, the push and pull factors affect the motivation factors (Mot) for making travel decisions. The analysis is carried out in the form of structural equations (Structural Equation Model: SEM) with the program Warp PLS 7.0. It was found that the weight value of the elements (Cross-Loading). It represents the value of the relationship between the latent variable and the observable variable of this structural equation. Values from 0.63-0.88 This is considered more valuable than 0.60 and significant (Henseler et al., 2012) as shown in Table 5. From the analysis, it is found that the reliability of the structural equation has statistical values that show the accuracy of the gauge in the equation as follows: The average path coefficient (APC) = 0.599, P<0.001 shows the average degree of influence of the equation, and the statistical significance is less. The Average R-squared (ARS) value = 0.616, P<0.001 assumes that the level of ability to explain the mean of the MOT variable of the equation, which is greater than 0.20, is within the acceptable threshold and the statistical significance level is less than 0.05 (Kock, 2017). Average full collinearity VIF (AFVIF) = 2. The Tenenhaus GoF (GoF) = 0.614 is above 0.36, indicating that the explanatory power of the model is considered acceptable (Cohen's, 1988).

Table 5. Cross-loadings (Source: From calculation)

Factors	Demography (Dem)	Push	Pull	Tourism motivation (Mot)
Entering Retirement Age (DEM1)	0.80			
Empowering Women to Lead in Tourism (DEM2)	0.85			
Your Income (Dem3)	0.85			
Your level of education (Dem4)	0.73			
Your Education Level (Dem5)	0.70			
Your Nationality (DM6)	0.77			
Your Past Travel Experiences (Push1)		0.75		
Your past travel behaviors (Push2)		0.78		
Your own desire to travel (Push3)		0.81		
Unique experiences to get from a travel trip (Push4)		0.75		
Entertainment from travel (Push5)		0.71		
The need to exchange and learn about your culture with other cultures. (Push6)		0.70		
The need to meet people. (Push7)		0.70		
Your financial liquidity (Push8)		0.73		
Need to relax (Push9)		0.63		
Finding information about the tourist attractions you are going to visit (Push10)		0.70		
The atmosphere of the attraction (Pull1)			0.70	
Service at tourist spots (Pull2)			0.82	
Attraction Safety (Pull3)			0.85	
Transportation Facilities (Pull4)			0.78	
The marketing strategy of the services of the tourist attractions that you perceive (Pull5)			0.76	
A new experience for you to shop for souvenirs at the attraction (Pull6)			0.79	
Advertising to invite tourists from the government and various agencies. (Pull7)			0.81	
Tourist attractions (Mot1)				0.80
Personal motivation (Mot2)				0.88
Emotional (Mot3)				0.88
Public Relations (Mot4)				0.67

Table 6. Latent variable coefficients (Source: from calculation)

Diagnostics	Dem	Push	Pull	Mot
R^2		0.68	0.51	0.65
Adjusted R^2		0.68	0.50	0.64
CR	0.91	0.92	0.92	0.89
Cronbach's alpha	0.88	0.90	0.90	0.83
AVE	0.62	0.52	0.63	0.67
VIF	2.76	3.30	2.69	2.91

From Table 6, it is found that the decision coefficient (R^2) of demographic factors (Dem) influencing the push factor and pull factor R2 = 0.68, 0.51, respectively, the deck of push and pull factors influence the tourism motivation factor

(Mot) R^2 = 0.65, adjusted R^2 has values ranging from 0.50 to 0.68, CR = 0.89 to 0.92, and Cronbach's alpha = 0.83 – 0.90, which is greater than 0.7 (Kock & Lynn, 2012). AVE = 0.52 – 0.67 is greater than 0.5, which is considered to be a valid latent variable relationship (Henseler et al., 2015; Fornell & Larcker, 1981; Kock & Lynn, 2012), and VIF = 2.76–3.30, which is less than 3.30 (Kock, 2015c; Kock & Lynn, 2012), showing that the variables are correlated at an acceptable level, resulting in a reliable model and leading to the estimation results shown in Figure 4.

From Figure 4, when testing, the statistics are appropriate and within acceptable values. It was found that the demographic factor (DEM) influenced the push factor and the pull factor, which are the transmission variables between the DEM and MOT factors, with β values of 0.83 and 0.72 respectively. There is a statistical significance of less than 0.01 for the pushing factor. The pushing factor influences the tourism motivation factor (MOT) of β = 0.44 and has a statistical significance of less than 0.01 (99%), and the pull factor had effect on the tourism motivation factor of β = 0.41, which is statistically significant less than 0.01.

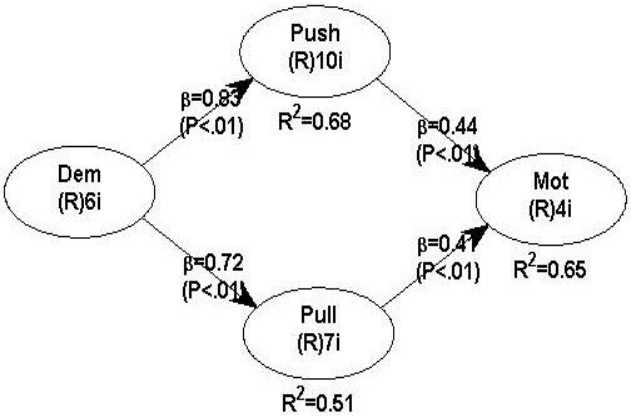


Figure 4. Analysis of conceptual framework I

3. Factors affecting the decision to visit by high-speed train of Thai and Chinese tourists in the Lao PDR area

Based on the study of factors that affect tourism motivation. Therefore, the researcher has studied the motivation factors in tourism that affect the return of travel according to the second conceptual research framework (Figure 3). The independent variable is defined as a factor. Image of the tourist attraction and tourism motivation factors. The following variables are the factors of returning to travel. The researcher studied the elements of the image factor of tourist attractions to confirm the composition of the factors. The image of the tourist attraction is appropriate. By analyzing the survey elements. (Exploratory Factor Analysis: EFA). Analysis of the elements of the image of tourist attractions, which is an analysis of the Exploratory Factor Analysis (EFA) is 0.85, Bartlett's Test of Sphericity Equal to 1613.81, df is 66 and the P-value is less than 0.01. It means that the information obtained is appropriate (Hair et al., 2010) as shown in This Table 7.

Table 7. KMO and Bartlett's Test (Source: From calculation)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.85
Bartlett's Test of Sphericity	Approx. Chi-Square	1613.81
	df	66
	Sig.	0.001

Then, considering the eigenvalues using the Varimax axis rotation method, it was found that there were 4 values above 1.00, as shown in Table 8, which shows that the image indicators of tourist attractions can be grouped into 4 factors.

Table 8. Total variance explained (Source: From calculation)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.518	37.648	37.648	4.518	37.648	37.648
2	2.035	67.819	67.819	2.035	67.819	67.819
3	1.667	13.894	51.542	1.667	13.894	51.542
4	1.049	8.742	60.284	1.049	8.742	60.284
5	.943	7.856	68.140			
6	.660	5.502	73.642			
7	.588	4.903	78.545			
8	.558	4.652	83.197			

When considering the factors, each variable has a loading value of more than 0.70 (Table 9) to represent the grouping of factors of the variables. Cultural Environment The image of the social environment and the infrastructure of tourist attractions can be classified into the same group and the latent variables are named to reflect the meaning of the overall factor, namely the image of the tourist attraction.

Table 9. Results of loading analysis

Questions	Component			
	1	2	3	4
The security and safety of buildings in tourist attractions such as buildings, stairs, etc.	0.77			
The road layout is appropriate and accessible.	0.84			
Cleanliness within tourist attractions	0.79			
Unique natural uniqueness		0.81		
There is a variety and richness of the landscape.		0.84		
It has a beautiful ecological environment and abundant waters.		0.82		
It has a highly recognizable traditional architecture.			0.83	
Having local cuisine with an identity			0.81	
There are activities of the traditional agricultural lifestyle.			0.76	
Interaction of local people				0.81
Having a positive attitude of the overall tourism provider.				0.86
Reasonable pricing of goods and services				0.85

After studying the elements of the image factors of tourist attractions and studying the factors that affect the motivation to travel, the factors that affect the return of Thai and Chinese tourists by high-speed train in Lao PDR are analyzed from the image factors of tourist attractions (Ima). This includes 4 variations comprising the environmental image of natural attractions (Ima1), Cultural Environment Image (Ima2), Social Environment Image (Ima3) and Tourist attraction infrastructure (Ima4). Then we took the whole of 4 factors to test the impact on the decision to visit again (Rev). This is a factor combined with the motivation factor in tourism (Mot) that affects the Rev factor.

According to the model as shown in Figure 3, the analysis was carried out in the form of a Structural Equation Model (SEM) with the program WarpPLS 0.7. The results of the estimation showed that the weight of the elements (Cross-Loading It represents the value of the relationship between the latent variable and the observable variable of this structural equation. Values from 0.67-0.90 This is considered more valuable. 0.60 and significant (Henseleret al., 2012) as shown in Table 10. From the analysis, it is found that the reliability of the structural equation has statistical values that show the accuracy of the gauge in the equation as follows: The average path coefficient (APC) = 0.674, P<0.001 shows the average degree of influence of the equation and is less statistically significant. 0.05. Average R-squared (ARS) = 0.641, P<0.001 assumes that the level of ability to explain the mean of Mot variable in the equation, which is greater than 0.20, is within the acceptable threshold and is less than 0.05 (Kock, 2011c).

Table 10. Cross-loadings (Source: From calculation)

Factors	Ima1	Ima2	Ima3	Ima4	Rev	Ima	Mot
Environmental Image of Natural Tourism Sites (Ima1)						0.76	
1. Unique Nature (Ima1.1)	0.81						
2. Diversity and Landscape Integrity (Ima.2)	0.89						
3. It has a beautiful ecological environment and rich water (Ima1.3).	0.72						
Cultural Environmental Image (Ima2)						0.79	
1. It has a highly recognizable traditional architecture (Ima2.1).		0.86					
2. Having Local Food with Identity (Ima2.2)		0.87					
3. Traditional agricultural lifestyle activities (Ima2.3)		0.82					
Social Environmental Image (Ima3)						0.85	
1. Local Human Relations (Ima3.1)			0.82				
2. Overall Positive Attitude of Travel Providers (Ima3.2)			0.87				
3. Reasonable Pricing of Goods and Services (Ima3.3)			0.79				
Tourist Infrastructure (Ima4)						0.71	
1. Stability and safety of buildings in tourist attractions such as buildings, stairs, etc . (Ima4.1)				0.87			
2. The road layout is reasonable and accessible (Ima4.2).				0.90			
3. Cleanliness inside tourist attractions (Ima4.3)				0.84			
1.If you want to travel again, you will choose to travel to Laos first. (Rev1)					0.84		
2. You wants to travel to Lao PDR more. (Rev2)					0.89		
3. You intends to introduce Lao PDR's tourism to his family. (Rev3)					0.84		
4. You intends to recommend Lao PDR tourism to friends and others. (Rev4)					0.81		
5. You intend to review and share news. (Rev5)					0.80		
1.Tourist attractions (Mot1)							0.80
2.Personal motivation (Mot2)							0.88
3.Emotional (Mot3)							0.88
4.Public Relations (Mot4)							0.67

Average full collinearity VIF (AFVIF) = lnf. This is because the variable analyzed is redundant, which can occur if the secondary latency variable is generated from the first-level latency variable. Sympson's paradox ratio (SPR) = 1.00 shows that there are no cases of Simpson's paradox in this model, and the R-squared contribution ratio (RSCR) = 1.00, which means that there is no negative R-squared value, and the statistical suppression ratio (SSR) = 1.00 and the

nonlinear bivariate causality direction ratio (NLBCDR) = 1.000, which is higher than the threshold of 0.7 (Kock, 2021). Table 11 shows that the decision coefficient (R2) of the image factor (Ima), which is measured by the factors Ima1, Ima2, Ima3, and Ima4, R^2 = 0.60, 0.64, 0.73, and 0.52, respectively, while the Ima factor, the Mot factor, influences the Rev R2 = 0.71 factor, the Adjusted R^2 has values ranging from 0.52 to 0.73, the CR value ranges from 0.86 to 0.92, and Cronbach's alpha = 0.75 – 0.90, which is greater than 0.7 (Kock & Lynn, 2012).

Table 11. Latent variable coefficients

Diagnostics	Ima1	Ima2	Ima3	Ima4	Rev	Ima	Mot
R^2	0.60	0.64	0.73	0.52	0.71		
Adjusted R^2	0.60	0.63	0.73	0.52	0.70		
CR	0.86	0.89	0.87	0.91	0.92	0.86	0.89
Cronbach's alpha	0.75	0.81	0.78	0.84	0.90	0.80	0.83
AVE	0.67	0.73	0.70	0.76	0.71	0.62	0.67
VIF	lnf	lnf	lnf	lnf	3.64	lnf	2.90

The VIF value of the Rev factor is 3.64, which is less than 5 (Hair et al., 1987; 2009; Kline, 1998; Kock, 2014a; 2021a), and the VIF value of the Mot factor is 2.90. which is less than 3.3 (Kock, 2015c; Kock & Lynn, 2012).

From Figure 5, when the statistics are tested, they are appropriate and within acceptable values. It was found that the image factor of tourist attractions (Ima), which is the second measurement factor, was measured from 4 factors: the environmental image of natural tourist attractions (Ima1), β = 0.77, which was statistically significant less than 0.01, the cultural environmental image (Ima2), β = 0.80, which was statistically significant less than 0.01, and the social environmental image (IMA3), β = 0.86 has a statistical significance of less than 0.01, tourist attraction infrastructure (Ima4), β = 0.72 has a statistical significance of less than 0.01, where the Ima factor has resulted in a Rev factor of β = 0.47, a statistical significance of less than 0.01, and for the Mot factor that affects the Rev factor, the value of β = 0.42 has a statistical significance of less than 0.01.

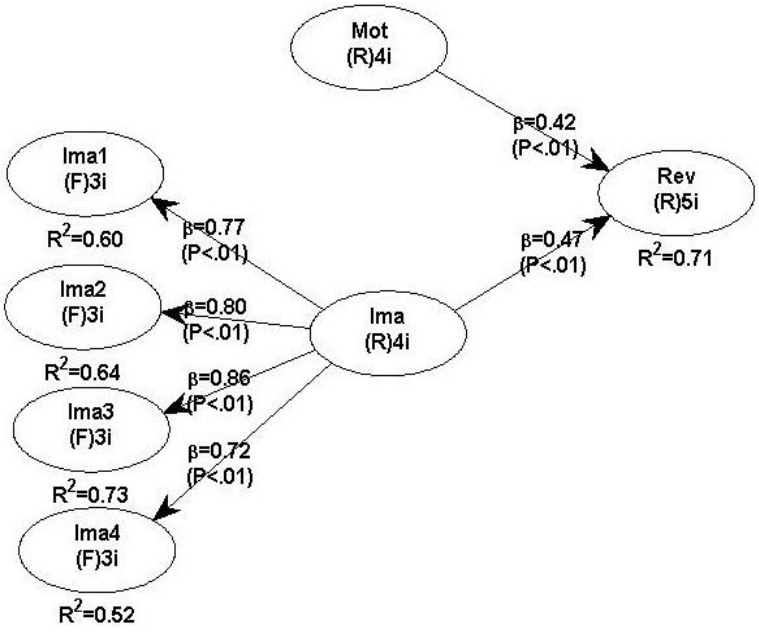


Figure 5. Analysis of conceptual research framework II

DISCUSSION AND CONCLUSIONS

Based on the study of the motivations of Thai and Chinese tourists in the Lao People's Democratic Republic, after the opening of the Laos-China railway service, by collecting questionnaires from Thai and Chinese tourists in the four provinces of Lao PDR, traveling by Laos-China high-speed rail, 400 people, most of whom are female, have a diploma/bachelor's degree, and have a career as an employee.

A Study of factors Affecting the Motivation of Tourists to Travel in Lao PDR found that demographic factors included Entering the retirement age, Giving women leadership in tourism, and Increasing the number of women in tourism, Income, Education level, Single status, and Nationality affect the motivation of Thai and Chinese tourists to travel to Thailand. In addition, there are pushing factors such as: Travel experience, The need to travel, The need for cultural exchange and learning, and pulling factors such as: the Atmosphere of tourist attractions, Transportation Facilities, The safety of tourist attractions (coefficient = 0.41) is a passing variable between demographic factors and the motivation of tourists to travel.

There are opinions about the image of tourist attractions for Thai and Chinese tourists in Lao PDR. The results are found that the image of tourist attractions is divided into 4 aspects, which tourists pay attention to in each aspect. As follows: 1. Environmental image of natural tourist attractions, which pay great attention to all aspects, namely the

uniqueness of nature, the diversity and richness of the landscape, and the beautiful ecological environment and fertile waters. 2. Tourists pay a lot of attention to highly recognizable traditional architecture. 3. Social environmental image Tourists attach great importance to the human relations of the locals and the positive attitude of the tourism provider as a whole and 4. Tourists pay great attention to the security and safety of buildings at tourist attractions in Lao PDR.

These variables are then considered in conjunction with motivation by studying the motivational factors and image factors that affect the decision to repeat the visit by high-speed train of Thai and Chinese tourists in the Lao PDR area. We found that the variables are: environmental image of natural attractions. Cultural environment. The image of the social environment and the infrastructure of tourist attractions can be classified into the same group as one factor, namely the image of tourist attractions. This affects the intention of returning to traveling again. Together with tourism motivation factors, such as incentives from tourist attractions. Motivation from individuals or incentives from the publicity of tourist attractions that affect tourists' intention to return to visit again. The image factor of tourism in the Lao PDR has a positive influence on repeat tourism rather than motivation and the cultural environment.

Based on a study of the level of opinion on the image of tourist attractions of Thai and Chinese tourists traveling by the Laos-China high-speed train in Lao PDR, we found that tourists pay attention to the image of tourist attractions, whether it is the natural identity and the unique landscape of tourist attractions. Traditional architecture in tourist attractions This is in line with the words of Nopsuwan & Chansri (2021), who said that the image of a tourist attraction is important for the decision to visit both in the past and in the future. Therefore, tourists pay attention to the image of tourist attractions. Those who related to tourist organization should have good management to create good memories for those who come to visit and so that the image of the tourist attractions makes an impression on those who visit.

Push and pull factors that affect the motivation of Thai and Chinese tourists to travel to the PDR. It was found that demographic data affects the driving force and pull off tourists to travel because different genders, ages, education levels, and income levels will affect different tourism motivations. In addition, this study shows that the difference in age, gender, education level, or even the income of tourists affects transmission factors such as driving factors and pulling factors of tourists, which affect the motivation of tourists to visit, by pushing factors such as experience, desire to travel, or even the desire to get new experiences from tourist attractions, and for pulling factors such as atmosphere, service at tourist spots, and safety of tourist attractions, it will result in tourists having motivation to decide to travel which consistent the study of Boontham & Busapruek (2021); Ngondo et al. (2024) It was found that the main driving factor that motivates tourists is relaxation and new experiences to get from tourism.

Factors affecting the decision to visit by high-speed train of Thai and Chinese tourists in Lao PDR are found that the image factor of tourist attractions affects the return of tourists due to the unique natural identity of tourist attractions, the diversity of landscapes, or the security of buildings in tourist attractions. As a result, tourists are impressed and returning to the tourist attractions supports the study of Kotcharee et al. (2021) by those who found that the return trip of tourists is based on the image of tourist attractions, such as good beaches. Attractive local food, suitable accommodation, and the motivation factors for tourism in this study also affect the return of tourists.

Due to the attractive tourist attractions. Personal motivation to travel for leisure or new experiences. The mood of tourists or even the publicity of tourist attractions will affect the return of tourism (Um et al., 2006). Therefore, the impact on the return of tourists depends on the motivation of tourists in tourism to relieve stress, to learn about the culture, or even to motivate them because of the publicity of tourist attractions.

According to the results of the study, tourism in Lao PDR is reflected in Thai and Chinese tourists who decide to travel to Lao PDR. In addition, the main factor in travelling to Lao PDR, that is the motivation of tourists, comes from the demographic factors of the tourists themselves. Creating a good tourist image of the Lao PDR in all tourism-related structures. It is a very important variable that will bring a response to the intention of travelling again. For this reason, the relevant agencies, especially in Lao PDR, should have guidelines or measures to develop and promote the country's image in all dimensions. This is to encourage Thai and Chinese tourists, who are the main tourist groups, as well as tourists from other countries, to meet the demand for repeat tourism in Lao PDR.

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ASSESSMENT OF THE MAIN COMPONENTS OF THE NATURAL AND RECREATIONAL POTENTIAL OF THE TENIZ-KORGALZHYN DEPRESSION USING GEOINFORMATION TECHNOLOGIES AND REMOTE SENSING METHODS

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Abstract: This article presents the research results and the development of a methodology for assessing the components of the natural and recreational potential of the Teniz-Korgalzhyn depression focusing on its suitability for recreation and ecotourism development. The aim of the study is to analyze the key components of the natural environment that form the basis of the recreational potential of the Teniz-Korgalzhyn depression, utilizing geoinformation technologies and remote sensing techniques. The proposed method allows for a detailed component-by-component analysis of the region's natural and recreational resources, including relief, water resources, and vegetation. The balance method was used to calculate the potential, providing an objective assessment and comparative analysis of the territory's potential. The methodology presented in the article not only determines the priority areas of recreational activity but also allows for assessing degree of accessibility of the natural and recreational resources of the area under study. As a result of the assessment of the region's resources, territories more favorable for the development of ecotourism were identified. Analysis of landscape data obtained using NDVI and MNDWI revealed differences in the natural and recreational potential of the Teniz-Korgalzhyn Depression areas. Areas with a high NDVI value are characterized by an abundance of vegetation, which indicates their potential suitability for recreational use. On the contrary, areas with low NDVI and high MNDWI indicate insufficient vegetation, but the possible presence of water bodies, which is also important for recreational planning. These differences demonstrate a clear comparative analysis of data on the two indices and allow for reasonable distribution of recreational resources, assessment of ecosystem degradation, and identification of priority areas for restoration and protection. Key findings highlight the region's diverse natural resources, influenced by climatic variability, anthropogenic factors, and habitat diversity. Water resources, essential in the continental climate, are vital for recreation but necessitate sustainable management to avoid ecosystem degradation. The findings underline the importance of sustainable resource use to preserve the ecological balance and promote tourism in the region. The Korgalzhyn Nature Reserve emerges as the most valuable natural asset, although much of the steppe ecosystem remains unprotected and requires ecological monitoring.

Keywords: natural and recreational potential, landscapes of the Nura River basin, Teniz-Korgalzhyn depression, remote sensing methods, geoinformation technologies, Normalized Difference Vegetation Index

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INTRODUCTION

The Teniz-Korgalzhyn depression is a valuable territory with a rich landscape and recreational potential. The first information about the Teniz-Korgalzhyn depression, its geography, and bird fauna was published by Levshin in the work "Description of the Kirghiz-Cossack, or Kirghiz-Kaisakh hordes and steppes" (Levshin, 1832). The region has a rich landscape and a diversity of flora and fauna (Tolegenuly et al., 2021). In the context of growing interest in ecotourism and sustainable nature management, assessing natural resources for recreation is becoming especially relevant. This territory is characterized by a variety of natural conditions, including unique relief, water resources, and vegetation, which makes it attractive for the development of recreational and tourist destinations. However, for the effective and sustainable use of the region's recreational opportunities, a scientifically based methodology for assessing its natural resources is needed (Adekenov et al., 2020). The Teniz-Korgalzhyn depression, located in a unique natural zone of Kazakhstan, is a valuable territory with a rich landscape and recreational potential. In the context of growing interest in ecotourism and sustainable nature management, assessing natural resources for recreation is becoming especially relevant. This territory is characterized by a variety of natural conditions, including unique relief, water resources, and vegetation, which makes it attractive for the development of recreational and tourist destinations. However, for the effective and sustainable use of the region's recreational opportunities, a scientifically based methodology for assessing its natural resources is needed.

The Teniz-Korgalzhyn depression is located in the central part of Kazakhstan; most of its surface belongs to the Kazakh Upland (Figure 1). The North Kazakh Plain is located in the north of Kazakhstan, bounded in the south and southeast by the Kazakh Upland, and in the west, it smoothly passes into the Torgai tableland. Structurally, this plain belongs to the West Siberian Plate, the basement of which consists of pre-Paleozoic and Paleozoic intrusive and metamorphic rocks. The plate is complicated by faults and has a stepped structure. To the west, towards Western Siberia, the thickness of the Mesozoic and Cenozoic deposits does not exceed 300 m. At the same time, in the direction of the Irtysh syncline, the depth of the basement reaches more than 2 km (Akbar et al., 2020).

The peculiarity of the North Kazakh Plain is the combination of island forests, urban landscapes, and industrial facilities with the widespread presence of agricultural landscapes on the steppe landscapes (Makhanova & Berdenov, 2022). According to morphological features, the North Kazakh Plain is divided into the accumulative plains of the Tobol, Ishim, and Irtysh regions. The Tobol and Ishim plains, separated by the Torgai hollow, form the North Torgai, also known as the Kostanai Plain. These plains have similar morphological features and a similar history of geological development.

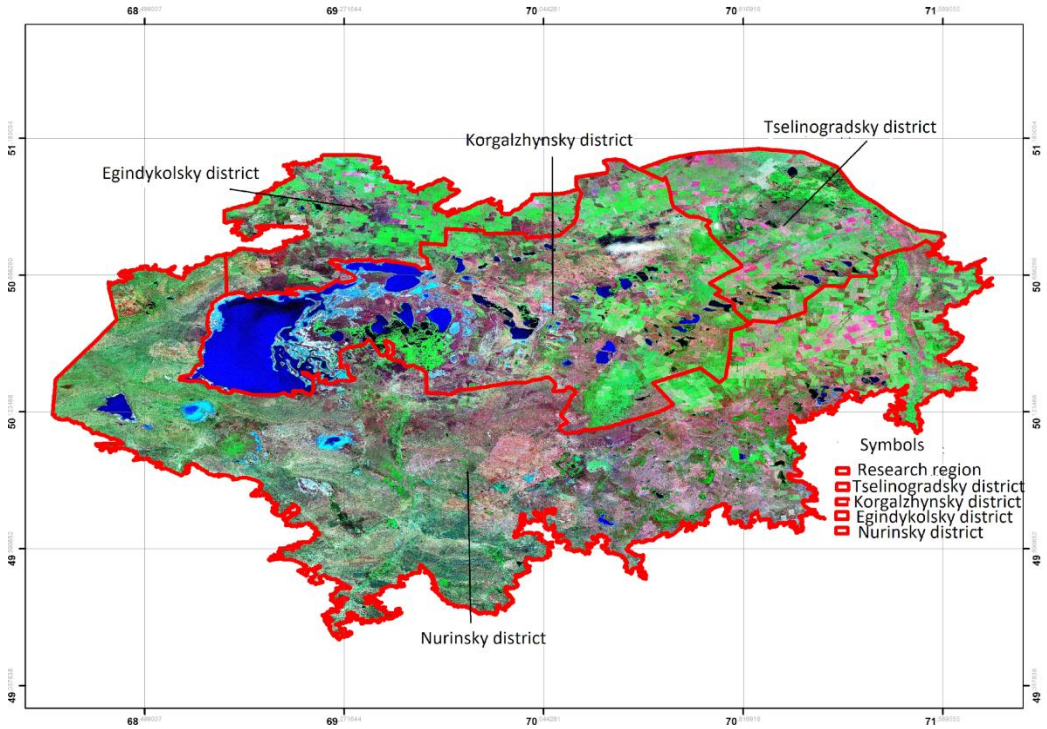


Figure1. Location of the Teniz-Korgalzhinskaya Depression (Source: Authors based on the ArcGIS)

The territory of the Teniz-Korgalzhyn depression includes the largest lake in the steppe zone – Lake Tengiz, the final water intake of the region. In rainy years, its area is 1590 km², the length of the coastline is about 470 km, the greatest depth reaches 6.7 m, and the mineralization of the water fluctuates significantly from 22 to 127 g/l (Davletbekov et al., 2018). Tengiz is an endorheic lake, fed mainly by the waters of the Nura and Kulanotpes Rivers (through the flowing Korgalzhyn lakes). Water in the lake is most often spent on evaporation. The lake consists of the main deep-water stretch and a large bay in the northeastern part (Akhmedenov et al., 2020).There are over 60 large and small islands on the lake, concentrated in the eastern part. On the southwestern side of Lake Tengiz, there are large lakes, formerly its bays - Kirey and Kypshak. In summer they dry up considerably. According to hydrochemical analyses, the mineralization of water in the

reservoirs of the Tengiz-Korgalzhyn lake system increases downstream of the Nura River: in the most flowing Lake Kokai it was 1.98 g/l, in Lake Sultankeldy – 2.59 g/l. Lake Yesei (3.63 g/l) and Lake Asubalyk (4.00 g/l) are more mineralized. Lake Tengiz is distinguished by significant mineralization up to 40.8 g/l in Big Tengiz and 55.9 g/l in Small Tengiz. The desalination effect of the Nura River on the eastern sections of Big Tengiz is observed (Davletbekov et al., 2018).

The water class in all lakes remains sodium chloride group II or III types. The level of organic pollution of water bodies in all studied areas does not exceed the MAC. Water pollution with heavy metals, zinc, and mercury in reservoirs is practically at the level of background values. This problem of environmental pollution with heavy metals is one of the most acute environmental problems of our time (Satova et al., 2020). Exceeding the MAC by 1.2-5.2 times the MAC for manganese content in water was revealed in almost all reservoirs (except for Lake B. Tengiz).

According to the analysis data, the copper content in lakes Asaubalyk, Yesey, and Kokai is increased (2-4 times and above the MAC) and fluorides (1.1-2.5 times above the MAC). The phenol content does not exceed the MAC. The iron concentration significantly exceeds the MAC in all reservoirs and is 4-6 MAC, reaching a maximum in the Nura River.

The lakes of the Teniz-Korgalzhyn system are flowing and include more than 20 lake reaches. A distinctive feature of the large lakes (Korgalzhyn, Teniz) is the presence of accumulative lake terraces. The first and second terraces of Lake Teniz, coastal ridges, and the bottoms of modern lakes are made up of modern lake sediments. The Nura River flows through the large lakes, and the remaining reaches are connected by small channels. Lake Asaubalyk can be classified as a brackish lake (Sagatbayev et al., 2019a). The water balance of the Teniz-Korgalzhyn lake system consists of inflow and outflow parts. The inflow is represented by the runoff of the inflowing Nura and Kulanotpes Rivers, the runoff from the catchment area of the lakes themselves, and precipitation falling on the water surface of the lakes.

The study hypothesizes that the greatest recreational potential is possessed by territories with high natural diversity, especially at the junction of natural environments (water, forests, mountains). Unique natural objects, such as high cliffs or wooded capes jutting out into lakes, are especially attractive for tourism. Researchers concluded that the obtained results of study are of fundamental environmental and economic importance when assessing water supply and can be used as an effective tool for the assessment of the influence of water factors during socio-economic forecasting of the region's development, especially recreational activities (Mustafayev et al., 2024).

Çadraku (2023) noted that natural and cultural values are important for current and future generations, as they serve as a medium for tourism and promote physical and mental relaxation. Tourism, as a type of economic activity, is aimed at the effective use of these resources in order to maximize their use in certain areas or countries. The aim of the study is to analyze the main components of the natural environment, which from the basis of the recreational potential of the Teniz-Korgalzhyn depression and to use geoinformation technologies and remote sensing methods.

METHODOLOGY

To assess the natural and recreational potential of the Teniz-Korgalzhyn depression, a methodology was developed that included a component-by-component analysis of the territory's natural components. The main task was to objectively assess landscapes' attractiveness, taking into account their natural, infrastructural, and environmental characteristics.

Special criteria were proposed based on research on the component-wise integrated assessment of the territory's natural and recreational potential (Gudkovskich, 2017; Popov and Gulyaeva, 2003). For the recreational and natural evaluation of landscapes, the indicators of all-natural components (relief, water bodies, vegetation cover, and specially protected natural areas) were taken into account. Images obtained as a result of the SRTM (Shuttle Radar Topography Mission) radar topography survey are grayscale images, the third coordinate of which is the height above sea level. The Shuttle Radar Topography Mission produced the Earth's most complete, highest-resolution digital elevation model (Farr et al., 2007). Such images are called a digital elevation model or DEM (Digital elevation model). The data are in the public domain and are distributed in squares measuring 1x1 degree (or 1201x1201 pixels) with a maximum available resolution of 1 second (or 30 meters). The Shuttle Radar Topography Mission produced the most complete, highest-resolution digital elevation model of the Earth. The project was a joint endeavour of NASA, the National Geospatial-Intelligence Agency, and the German and Italian Space Agencies and flew in February 2000 (Farr et al., 2007). Our methodology used three key indicators: relief, vegetation, and water resources. Each contributed to the integrated assessment of the territory's potential.

First, the relief was assessed based on the digital elevation model (DEM) obtained using Shuttle Radar Topography Mission (SRTM) data. The main parameters for the analysis were the surface slope angle and absolute height. More pronounced relief was considered attractive for active types of tourism, such as mountaineering or hiking. The values of the surface height and slope were ranked on a scale from 0 to 5 points, where the maximum score was assigned to areas with the most favorable characteristics for recreation Sagatbayev et al. (2019b). Our methodology used three key indicators: relief, vegetation, and water resources. Each of them contributed to the integral assessment of the territory's potential.

Second, the vegetation was analyzed using the NDVI (Normalized Difference Vegetation Index) index, calculated based on Landsat satellite data. The Normalized Difference Vegetation Index (NDVI), one of the earliest remote sensing analytical products used to simplify the complexities of multi-spectral imagery, is now the most popular index used for vegetation assessment (Huang et al., 2020). This index allows one to assess the density of vegetation cover, which directly affects the ecological and aesthetic attractiveness of the territory. NDVI values were also ranked on a scale from 0 to 5 points, where high values corresponded to dense and diverse vegetation. NDVI employs the Multi-Spectral Remote Sensing data technique to find Vegetation Index, land cover classification, vegetation, water bodies, open areas, scrub areas, hilly areas, agricultural areas, thick forests, and thin forests with few band combinations of the remotely sensed data (Gandhi et al., 2015).

Thirdly, water resources were assessed based on the MNDWI (Modified Normalized Difference Water Index). This index was used to identify and evaluate water bodies such as lakes, rivers, and reservoirs. MNDWI is more suitable for enhancing and extracting water information for a water region with a background dominated by built-up land areas because of its advantage in reducing and even removing built-up land noise over the NDWI (Xu, H. 2006). The presence of water resources increases the attractiveness of the territory, as it contributes to the development of beach, water, and health tourism. MNDWI values ranged from 0 to 5 points depending on the area and quality of water bodies.

To standardize the assessment, the territory was divided into rectangular cells measuring 1 × 1 km. Each cell was analyzed separately to calculate the total score for three indicators. The final score was determined as the sum of the scores for relief, vegetation, and water resources, taking into account transport accessibility. Transport accessibility was assessed using a coefficient that reduced the total score for areas with limited access. For example, remote areas or areas without access roads could lose up to 2 points (Sagatbaev & Dunets, 2019). The final assessment of recreational potential was calculated as the sum of points for relief, vegetation, and water resources, taking into account transport accessibility.

Based on the data obtained, the entire territory was divided into three categories:

- High potential (12-15 points): unique natural areas with high aesthetic and recreational value, such as the Korgalzhyn Reserve and Lake Karasor.
- Medium potential (6-11 points): areas with moderate natural resources and limited infrastructure, such as areas around the cities of Karaganda and Temirtau.
- Low potential (0-5 points): semi-desert areas with poor vegetation, minimal water resources, and complex relief.

To check the reliability of the results, verification was carried out by comparing them with a map of tourist infrastructure. The analysis showed that key tourist sites are concentrated in areas with a high integral score, which confirms the validity of the proposed methodology. The developed methodology allows not only to assess the natural and recreational potential of the study area but also to apply it to other regions. This enables strategic tourism planning that takes into account natural features and sustainable resource management.

RESULTS

Remote sensing data were used to study the territory of the Teniz-Korgalzhyn depression. The images were stitched together by coordinates in the ENVI software package. ENVI provides a variety of software solutions for processing and analyzing geospatial imagery. As a result of stitching, a multi-sheet raster base of the relief model was obtained. ArcGIS GIS was used to visualize the model. A fragment of the digital relief model is shown in Figure 2.

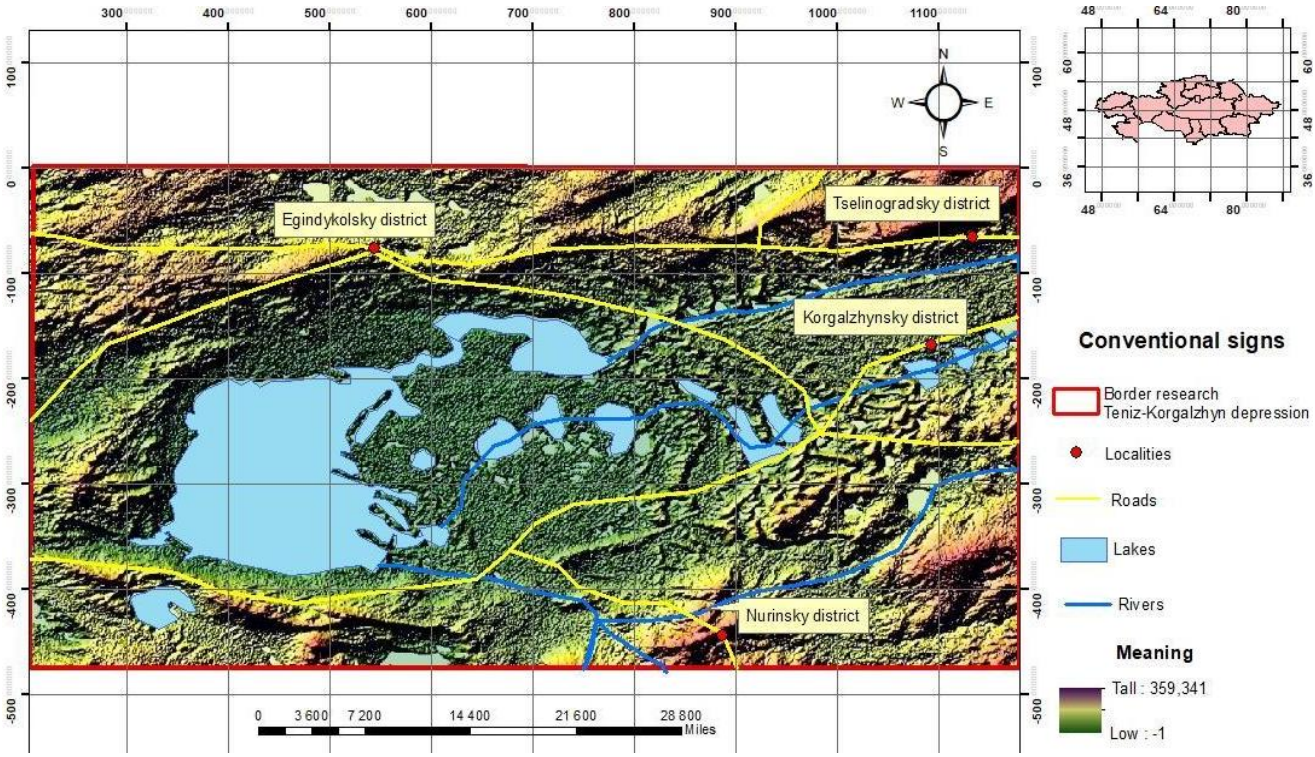


Figure 2. Visualization of the digital elevation model Shuttle Radar Topography Missionof the Teniz-Korgalzhyn Depression (Source: Authors based on the ArcGIS)

A digital elevation model (DEM) of the Teniz-Korgalzhyn Depression area, displayed in a color scale, where elevation differences are visualized through a gradient from green to red (Zengina et al., 2024). The green areas in the image indicate low-lying and flat areas, these are depressions and water bodies, in particular, Lake Tengiz, located in the center of the image. Red and orange shades indicate higher areas of the relief, which makes it easy to identify the hills and mountain ranges

surrounding the depression. This method of colour coding the relief helps to highlight the main morphological structures of the region and to assess potential watercourse directions and slope processes (Figure 2). This image is useful for determining the recreational potential of the territory, thanks to which it allows you to visualize geomorphological features that affect the accessibility and attractiveness of the site for various types of tourism. Color mapping of the relief also facilitates planning for environmentally sustainable use of the territory, highlighting areas requiring additional environmental protection measures. The territory under study occupies the Teniz-Korgalzhyn depression and the plains surrounding it. The Teniz-Korgalzhyn depression is bounded by the Arganata, Shadraly, Eskenei, and other elevations. The northern sections of the depression are elevated by the Erementau Mountains and bordered by the Atbasar Plain. The boundaries of the Teniz-Korgalzhyn physical-geographical region pass through points whose absolute heights are 300 m (Figure 3).

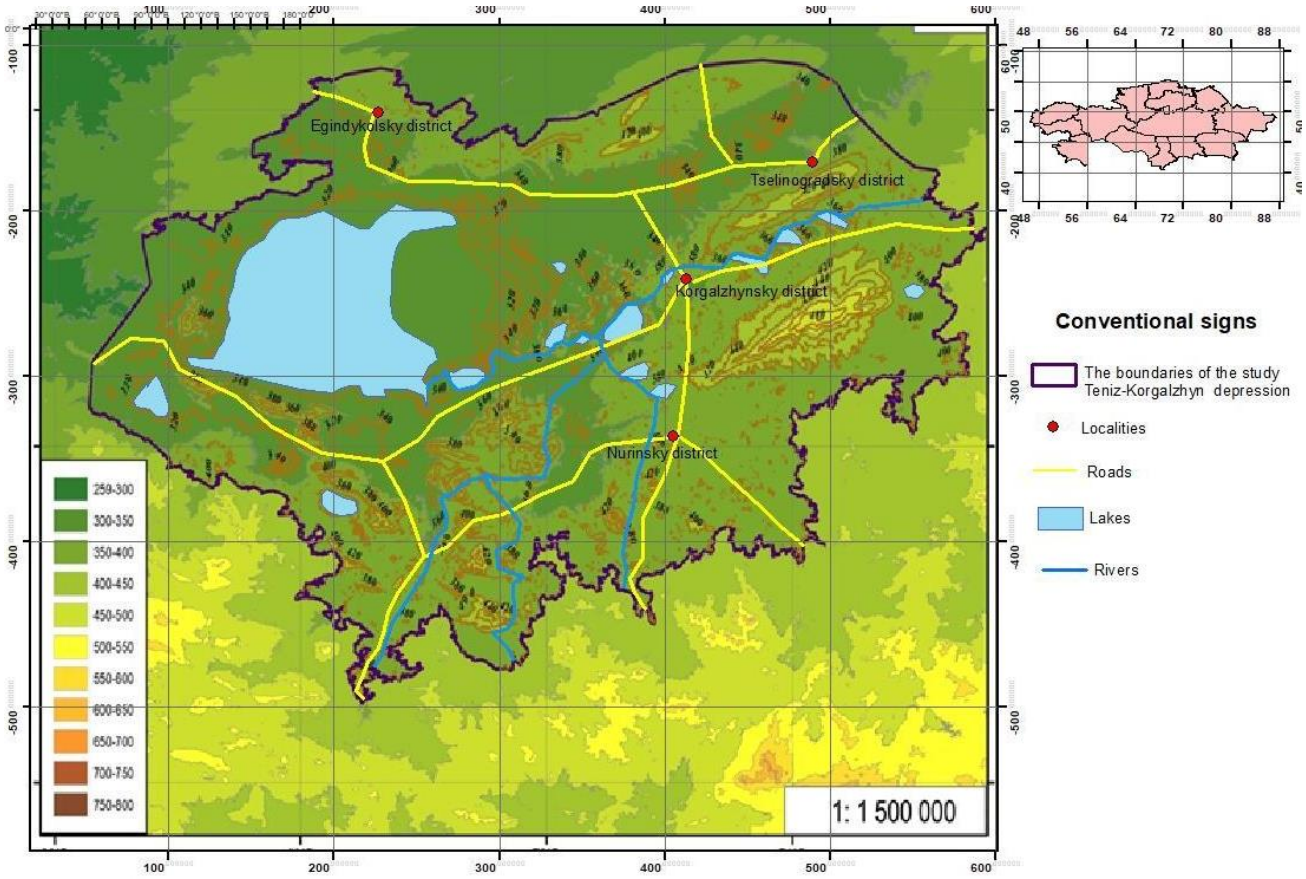


Figure 3. The elevation map of the Teniz-Korgalzhyn depression based on SRTM data (Source: Authors based on the ArcGIS)

The elevation map of the Teniz-Korgalzhyn Depression, based on SRTM (Shuttle Radar Topography Mission) data. Elevations on the map are displayed using a color scale, where different elevation ranges are indicated from light green (lowlands) to brown-red (highlands). Color gradations help to determine the territorial distribution of elevation levels: light green areas indicate low-lying areas of the depression, while yellow and red colors emphasize areas with higher elevations.The map displays the main geomorphological elements of the Teniz-Korgalzhyn Depression, including flat and hilly areas, as well as areas with elevation differences, which is important for understanding the relief structure of the region. This elevation characteristic is necessary for the analysis of natural and recreational potential and sustainable planning of the territory. The map also helps to determine which zones may be subject to erosion processes or require environmental protection measures (Karabalayeva et al., 2024). The relief of the gently rolling plain is broken by flat ravines, small hills, and knolls. The formation of the Teniz-Korgalzhyn depression dates back to the Devonian period. The sedimentary cover is represented by carbonate salt-bearing deposits. In the Neogene-Quaternary period, erosion-accumulative processes develop against the background of general neotectonic uplift in the east and relative subsidence in the west.

The vegetation map (Figure 4) of the Teniz-Korgalzhyn Depression shows various types of vegetation distributed over the area. The color gradation and legend on the map help identify different vegetation zones, distinguished according to the nature of the flora and the extent of its distribution. Water bodies (rivers and lakes) are also marked in light blue, which helps to better understand the spatial structure of the ecosystem. The map clearly demonstrates zones with different vegetation, such as steppe areas, shrub thickets, meadow areas, and marshy areas, which is important for analyzing the biological diversity of the region. The numbering and color categories on the map correspond to different types of vegetation, which are indicated in the legend, allowing you to accurately identify plant communities in each area (Tleugabulov et al., 2022). This map is necessary for assessing the natural and recreational potential of the territory because the diversity of vegetation plays a significant role in the ecological state of the region and its attractiveness for recreation.

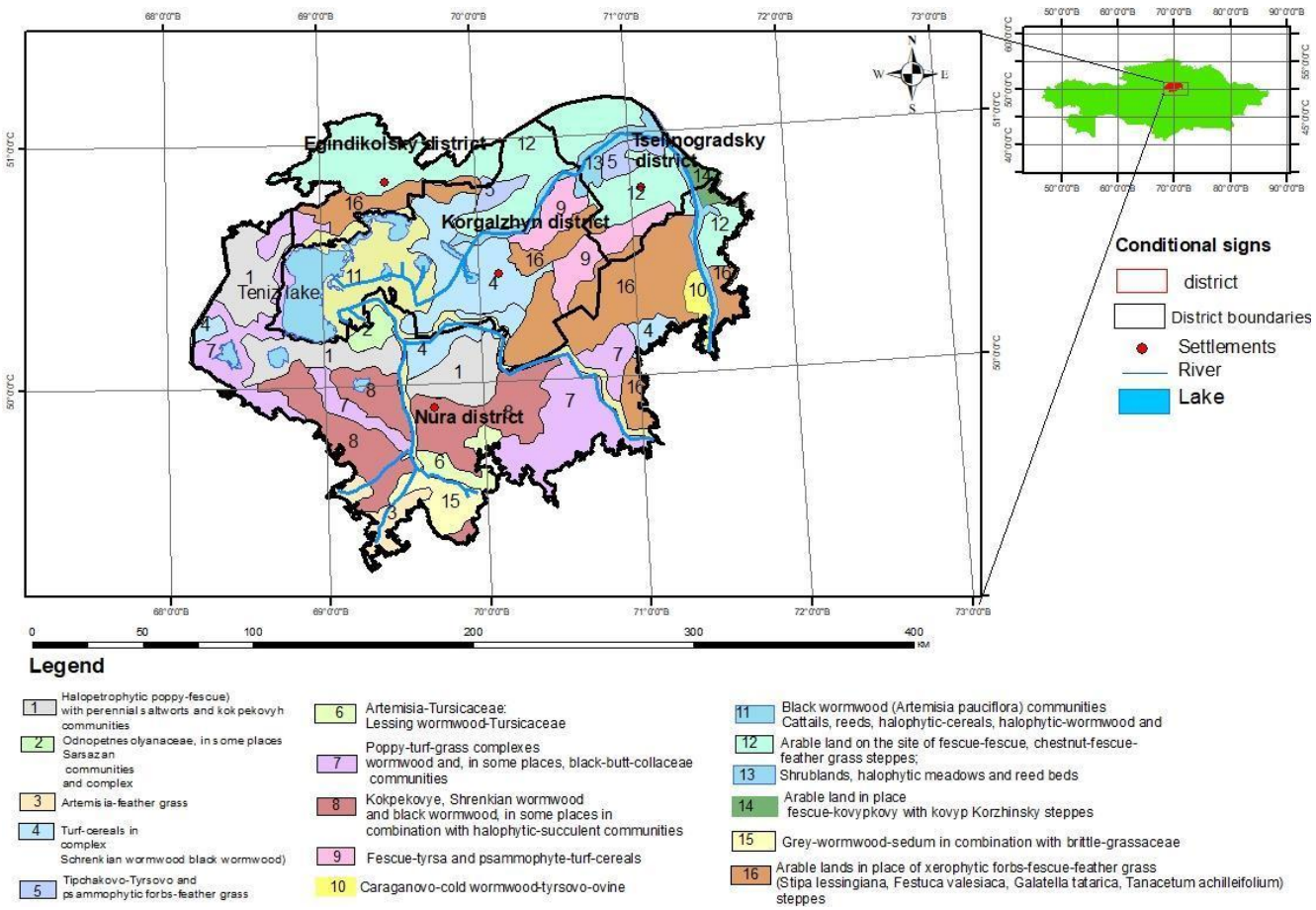


Figure 4. Vegetation map of the Teniz-Korgalzhyn depression (Source: Authors based on the ArcGIS)

Knowledge of the spatial distribution of vegetation types allows identifying areas with high conservation value and planning sustainable use of these territories. Ecological-dynamic series are adopted to reflect the vegetation cover of river floodplains and valleys. The series includes communities and soils of all ecological levels of the floodplain (reflecting the influence of alluvial) and above-floodplain (reflecting the influence of additional moistening by groundwater and the associated salinization of soils) within any section of a river valley with fairly uniform environmental conditions.

Thus, the high level of floristic diversity is facilitated by several factors:

1) the location of the territory within three subzones with different climatic features - moderately dry steppes on dark chestnut soils, dry steppes on chestnut soils, and desert steppes on light chestnut soils;

2) the diversity of plant habitats (steppe plains - clayey, gravelly, and stony; various rocks of small hills; banks of rivers, lakes, salt marshes);

3) anthropogenic activity contributing to an increase in the number of alien and weed species.

In general, 6 types of vegetation are widely represented on the territory: steppe, desert, meadow, marsh, shrub, and submerged-aquatic (Table 1).

Table 1. Characteristics of the main types of vegetation and the main formations of the Teniz-Korgalzhyn depression

Vegetation type	Vegetation subtype	Formations
1	2	3
Steppe	Bunchgrass	Feather grass, *fescue*, tyrsovaya, tyrsika, korzhinskogo stipa, eastern feather grass
Desert	Halophytic wormwood	Shrenkiano-wormwood, sintered wormwood, black wormwood
	Perennial saltwort	Kokpekovye anajuphos, *echinocaceae*
	Succulent saltwort	*Sarsazanaceae*, orach, annual saltwort
Meadow	True meadows	Wheatgrass, reed grass, field grass, foxtail, brome, bluegrass, *licorice*
	Marshy meadows	Reed, cattail, sedge
	Halophytic	*Alacritaceae*, chee, azhrekovye, barley
Marsh	Grassy	Reed, cattail
Shrub	Steppe-shrub	*Spiraeaceae*
	Floodplain-shrub	*Willow*
Submerged aquatic vegetation		Plants of the genus pondweed, floating ferns, hornwort, and duckweed.

The main types of vegetation of the Teniz-Korgalzhyn Depression are classified by dominant species and environmental conditions. The table shows the types of steppe, wormwood-feather grass, small hills, and halophytic plant communities, as

well as the features of vegetation found along rivers and lakes. Each type of vegetation is described taking into account the characteristic plant species, such as fescue, feather grass, wormwood, and other species adapted to the conditions of the region, including arid and saline soils (Table 1). This cartographic material was later used to describe and geographically characterize the study area, as well as to create a landscape map of the Teniz-Korgalzhyn Depression.

Using standard tools of the ArcGis 10.2 geoinformation program, we calculated all the indicators. Previously compiled medium-scale landscape map of the Teniz-Korgalzhyn Depression (Figure 5)

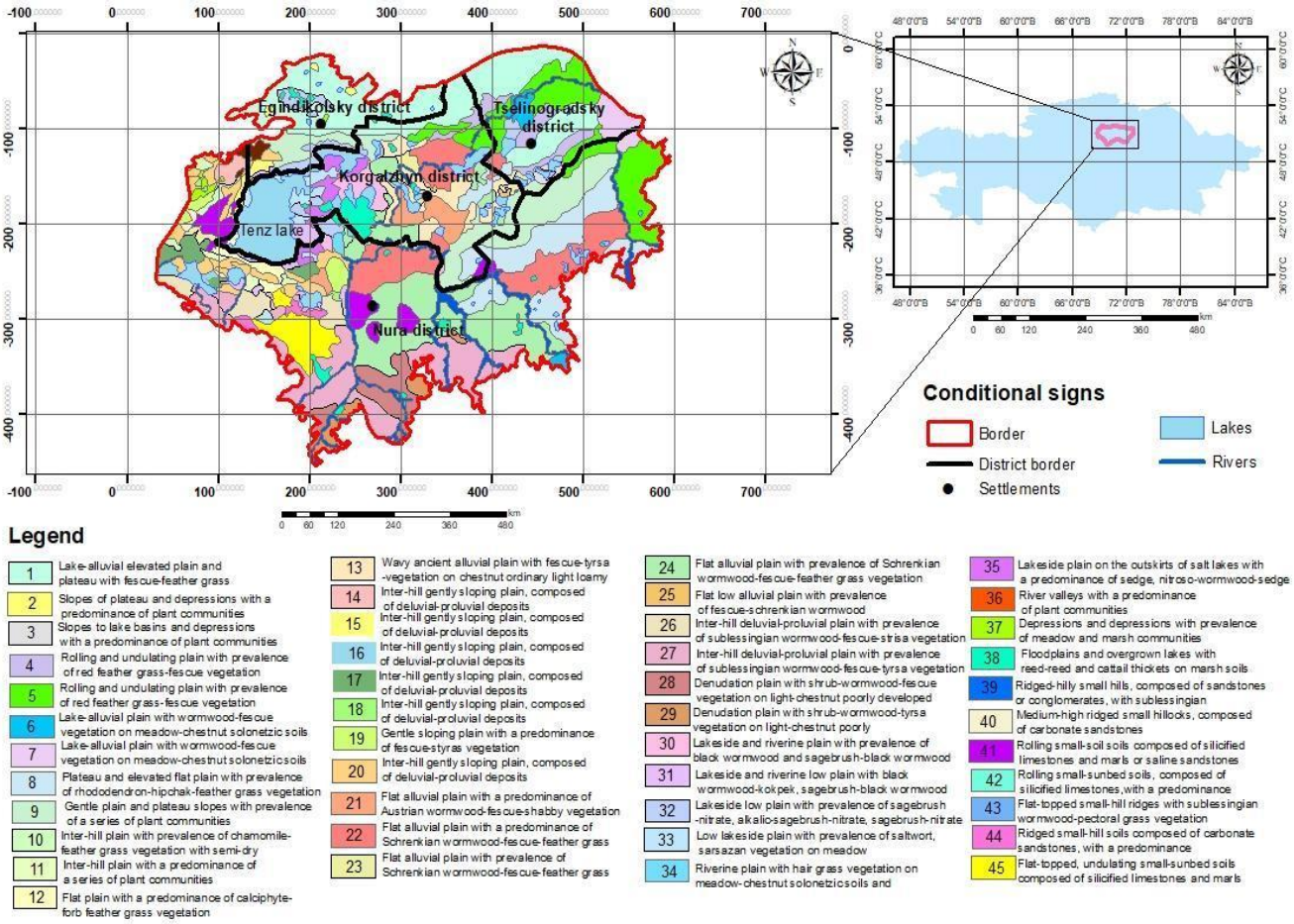


Figure 5. Landscape map of the Teniz-Korgalzhyn Depression (Source: Authors based on the ArcGIS)

The landscape map of the Teniz-Korgalzhyn Depression territory presents various landscape zones reflecting the territorial distribution of natural complexes, including steppe, forest-steppe, and lake ecosystems. By the color scale and symbols, various types of landscapes are distinguished, such as flat steppes, floodplain areas, and zones with water bodies. The boundaries of the study area are also marked. This cartographic material is important for understanding the natural diversity of the Teniz-Korgalzhyn Depression and serves as a basis for assessing the recreational potential.

The morphological structure of the landscape is a key factor in assessing the favorability of landscape components and their functional suitability for recreational purposes. Relief plays a central role in forming conditions for climatic, hydrological, and biospheric processes, which determines its high value in the framework of recreational use of the territory. The diversity of the relief creates unique conditions for recreation, including psychophysical regeneration and a favorable environment for active and passive recreation. The relief of the territory is formed under the influence of internal and external natural processes. Tectonic movements resulting from the geothermal activity of the Earth cause the formation of faults, and the uplift and subsidence of crustal blocks, affecting the formation of various geomorphological structures, which in turn affect the recreational potential of the territory.

To assess the suitability of the relief for recreational purposes, geomorphological indicators were used, where the angle of inclination and absolute height of the terrain were determined using the SRTM digital elevation model. These indicators were ranked on a scale, where the maximum values correspond to the greatest recreational suitability for active types of recreation, and the minimum values are suitable for passive and health tourism. There is a clear relationship between geomorphological indicators and recreational opportunities.

For example, areas with pronounced differences in altitude are preferable for laying tourist routes, while flatter areas are suitable for organizing health tourism (Table 2). Thus, the relief assessment scale is developed taking into account the specifics of recreational activities, allowing for a differentiated approach to the use of the landscape depending on its functional characteristics and the requirements of various types of tourism.

Table 2. Favorability assessment scale based on geomorphological indicators

	Indicators	Scale of points					
		1 p.	2 p.	3 p.	4 p.	5 p.	6p.
	Absolute height, m	<170	180	200	250	270>	310>
	Surface slope angle, degrees	1	3	5	7	9	11

Dwal (hydrological) resource by one of the factors of regional development, which has a significant impact both on tourist-recreational activities and on the development of tourism as a whole, is. The concept of "water recreational resources" can be defined as the presence (or set) of water bodies with favorable conditions for various types of recreational activity. Their recreational value is determined by a whole group of heterogeneous factors: the coastal landscape, depth, temperature of water, shape, remoteness from large cities, the bias of the coast, and the provision of access roads. Water bodies are an important recreational resource. Favorable hydrological conditions for recreation are expressed, first of all, in the existence of water flows or water surfaces of environmentally friendly, with the corresponding temperature and flow rate that make it possible to create natural beaches, swimming pools, artificial reservoirs suitable for cultivating different types of water sports. In addition, most recreational objects are located along open reservoirs, and beach-coal rest is one of the most popular among vacationers. Water can be a strong healing and healing factor.

The convenient location of reservoirs and the presence of medicinal mud and mineral springs make the territory promising for water tourism. The value of vegetation for recreation and tourism, since the vegetation cover performs many important functions, making a person's stay in nature comfortable and useful for his body, whether it is a journey or just a rest in the fresh air. Currently, the purpose of tourist trips is increasingly becoming the knowledge of the vegetation cover of our planet, as well as the use of its useful properties in the healing of the body. If we consider the vegetation cover from the point of view of recreation, you can see that it performs a variety of functions: 1) environmental, 2) aesthetic-cognitive, 3) recreational, 4) food, and 5) therapeutic. Thus, the plant world performs very important functions, having a therapeutic effect on both the physical and mental health of a person and is a kind of shield for his body from adverse factors.

For green vegetation, reflection in the red region is always less than in the near-infrared, so NDVI values for vegetation cannot be less than 0. The larger the green phytomass, the higher the index. The value of the index is also affected by the species composition of vegetation, its closing, condition, exposure, angle of the surface, and soil color under the sparse vegetation. The index is moderately sensitive to changes in the soil background, except when the density of the vegetation cover is below 30%. The index can take values from -1 to 1. For green vegetation, the index usually takes values from 0.2 to 0.8. The assessment was carried out using NDVI and MNDWI indices, which determined the density of vegetation and the presence of water bodies. The ranking method was based on a point scale, where climatic indicators (temperature, precipitation), relief, vegetation, and accessibility of objects were taken into account.

When processing space shots in the ENVI software complex, a special calculator of vegetation indices was used.

As a result of the calculation of NDVI according to the space pictures of 1975 and 2024. Index images of the territory of the Teniz-Corgalzhinsky hollow were obtained, the fragment of which is presented in Figure 6.

Figure 6 presents the result of the NDVI index calculation (Normalized Difference Vegetation Index) according to the Landsat satellite system, received on June 5, 2024. NDVI is an important indicator for assessing the state of vegetation in the test territory since it allows you to distinguish areas with active and weak vegetation.

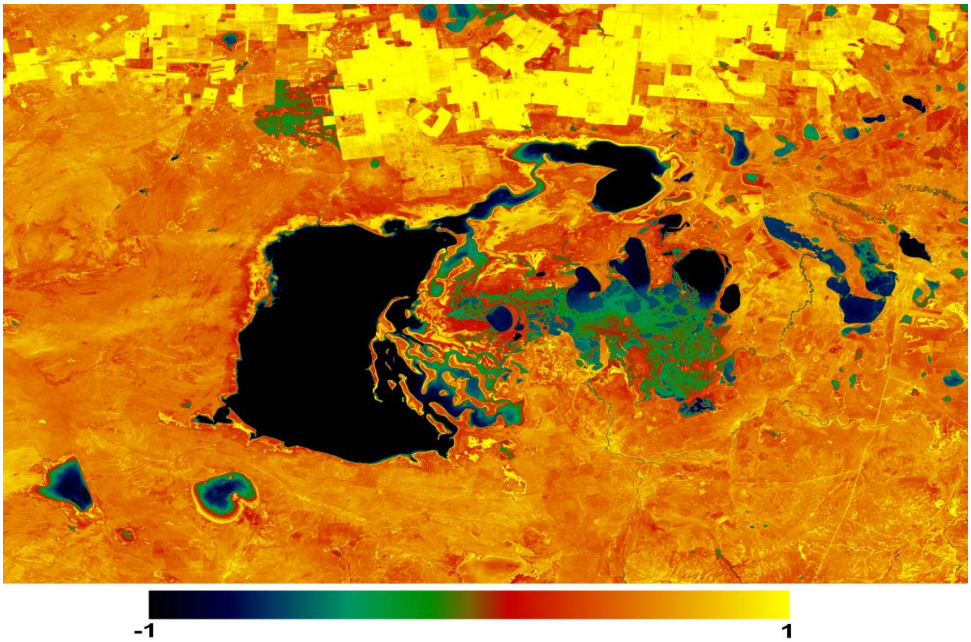


Figure 6. A fragment of the result of the NDVI index calculation by image of the Landsat system dated 05/06/2024 (Source: Authors based on the ArcGIS)

The image shows the Teniz-Corgalzhyn cavity, where the level of growing season and vegetation varies depending on the NDVI indicator. The color scale at the bottom of the drawing varies from -1 to 1, where the values close to -1 (blue and purple shades) indicate the absence of vegetation or the presence of water bodies, while values close to 1 (green shades) indicate areas with a high activity of vegetation.

The zones with minimal NDVI values are distinguishable, representing water bodies, such as Lake Teniz, marked with black colors. The areas with moderate and high vegetation located along the periphery of the lakes are shown by green shades, this indicates the presence of thick vegetation. The lightest yellow-orange areas are indicated for weak or absent vegetation, which testifies to arid or cultivated territories. This analysis of the NDVI index is an important tool for monitoring the state of the ecosystem of the shadow-correlates cavity, allowing you to evaluate the distribution and density of the vegetation cover, as well as identify zones that require additional environmental measures or monitoring.

Table 3 presents the values of the NDVI index of the main types of objects in the image.

Table 3. NDVI index values of the main types of objects

Type of object	NDVI value
Very powerful thick vegetation	0.8-1
Powerful, thick vegetation	0.67-0.8
Scarried and discharged wood and shrub vegetation	0.4-0.5
Shrubs and pastures	0.2-0.4
Open soil	0.09-0.2
Rocks, sand, snow	-0.1-0.1
Water object	-0.42 – -0.33
Artificial materials (concrete, asphalt)	-0.55 – -0.5

NDVI has a good correlation with the biomass of vegetation. The dependence between these parameters, as a rule, is not direct and is associated with the characteristics of the studied territory, its climatic and environmental characteristics. So, for example, in this work, NDVI maps will be used to create masks of arable land in the classification of ground cover.

When processing space shots in the ENVI software complex, a special calculator of spectral channel mathematics was used. As a result of the calculation of MNDWI according to the space pictures of 1975 and 2018. Index images of the Teniz-Corgalzhyn cavity were obtained, a fragment of which is presented in Figure 7.

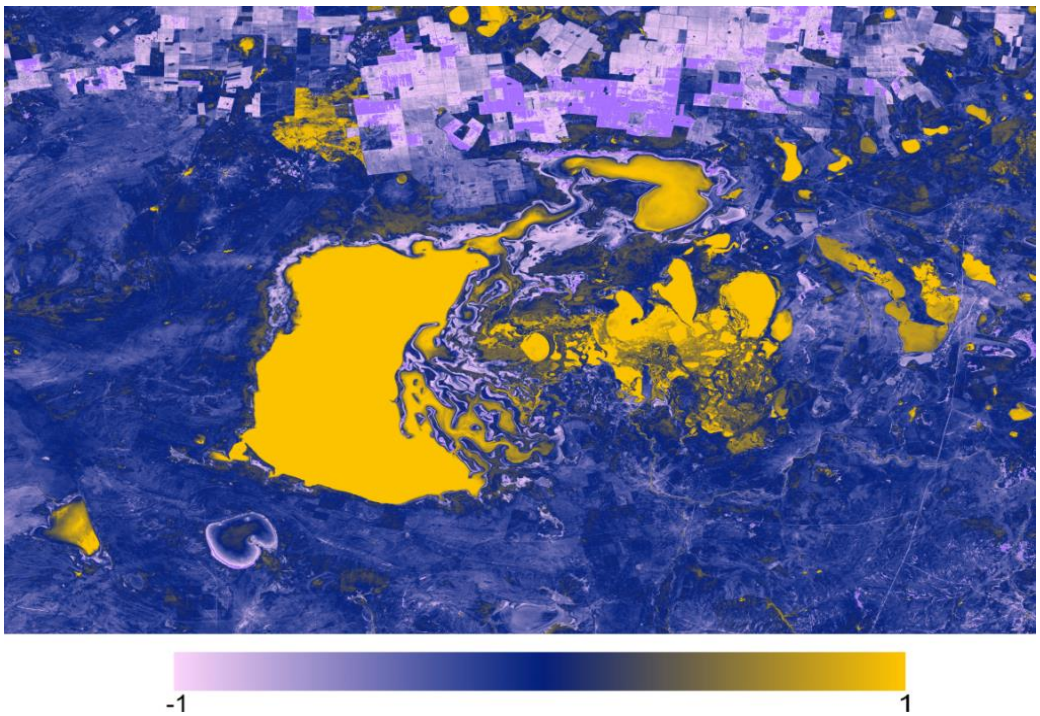


Figure 7. A fragment of the result of the MNDWI index calculation by image of the Landsat system dated 05/06/2024 (Source: Authors based on the ArcGIS)

This figure shows a fragment of the calculated MNDWI (Modified Normalized Difference Water Index) based on Landsat data from June 5, 2018. The MNDWI index is used to highlight water bodies on the surface, as it improves the distinction between water and other objects, such as vegetation or built-up areas. The color scale in the image varies from -1 to 1. Areas with high index values (shown in yellow) indicate the presence of water, which is especially noticeable in large water bodies such as Lake Teniz and other nearby water systems. Low index values, shown in dark blue and purple, correspond to dry areas not covered by water, including areas with vegetation and urban buildings.

This analysis is an important tool for monitoring the state of water resources in the Teniz-Korgalzhyn Depression, as it allows one to estimate the area and distribution of water bodies, as well as to identify changes in them that may be caused by seasonal or anthropogenic factors. Taking into account the landscape structure, as well as the presence of lands of various categories, it is possible to calculate the level of anthropogenic transformation of the territory. According to the proposed methodology, in the case of extensive development of the territory, the analysis of the land use structure is carried out within administrative boundaries. To determine the degree of anthropogenic load on lands, expert point assessments are introduced. Each type of land receives a corresponding point.

The territory under study can be most successfully used for the development of ecotourism. Of interest is the diversity of vegetation and landscapes combined with the opportunity to observe animals and birds. The highest ratings of recreational components are characteristic of hilly landscapes, as well as near water bodies on the Nura River, lakes Sholak, Zharsuat and Shubasor. Eco-routes for tourists can operate from May and end in October.

DISCUSSION

Based on the collected data, we developed a map of the landscape's natural and recreational potential of the Nura River, which reflects the distribution of different levels of recreational suitability of the territory.

Areas with low natural and recreational potential are mainly represented by hilly-dome-shaped landscapes composed of granite, dolomites, sandstones, and siltstones. These landscapes are characterized by steppe plant communities, where feather grass, wormwood, and fescue prevail, as well as shrub species growing on light chestnut, poorly developed, and saline soils. Semi-desert landscapes of the Nura River have limited recreational opportunities due to the lack of natural resources that can significantly increase their attractiveness, such as therapeutic mud or mineral springs. This reduces interest in these areas for recreational and tourist use.

Landscapes with an average degree of natural and recreational potential include the area around the city of Karaganda. The average annual precipitation here is 220 mm, the duration of sunshine reaches 2100 hours per year, and the average annual wind speed is 3 m / sec. This territory is part of the desert region of Betpak-Dala. Natural conditions turned out to be favorable for moderate recreational loads, and this allowed for the development of tourism and health activities within these territories. The highest natural and recreational potential is possessed by landscapes, the following areas with unique natural objects: Korgalzhyn State Nature Reserve and the therapeutic mud of Lake Karasor, located 45 km north of Karkaralinsk. These territories are characterized by high levels of precipitation (average annual amount is 320 mm) and a significant height of snow cover (25-27 cm), which helps maintain unique ecosystems and their biodiversity.

The Korgalzhyn State Nature Reserve "Pearl of the Region" is included in the UNESCO World Heritage List and performs an important function in preserving and developing the natural habitat, as well as maintaining biological diversity. The reserve is home to 123 large and small lakes, including Tengiz and Korgalzhyn, and has 347 bird species, 41 of which are listed in the Red Book of Kazakhstan, and 26 species are in the International Red Book. The reserve also has 443 species of flowering plants, in connection with which its significance as a natural site of global significance is noted. The Karkaraly State National Nature Park also belongs to the territory with high natural and recreational potential. This park contains important historical and cultural sites: the Kyzyl-Kensh Palace, an archaeological site of the Kent forestry, and the Forester's House in the Komissarovka tract, built in 1914. The list of specially protected areas of national significance includes the following objects: Mount Zhirensakal, the Three Caves Grotto, Kalmyk Val, the Bolshaya Palata Stone Grotto, the Bassein and Shaitankol Lakes, and the Sphagnum Bog. These objects have not only aesthetic, but also scientific, cultural, and ecological value, contributing to an increase in the tourist attractiveness of the region.

Thus, the research revealed a significant contrast in the natural and recreational potential of various landscape zones of the region. Landscapes with low potential require significant efforts to improve their recreational attractiveness, while areas with medium and high potential can already be used to develop tourism, health, and cultural events.

Analysis of landscape data obtained using NDVI and MNDWI revealed differences in the natural and recreational potential of the Teniz-Korgalzhyn Depression areas. Areas with a high NDVI value are characterized by an abundance of vegetation, which indicates their potential suitability for recreational use. On the contrary, areas with low NDVI and high MNDWI indicate insufficient vegetation, but the possible presence of water bodies, which is also important for recreational planning. These differences demonstrate a clear comparative analysis of data on the two indices and allow for reasonable distribution of recreational resources, assessment of ecosystem degradation, and identification of priority areas for restoration and protection. The recreational potential of the region was ranked. Areas with high potential are presented in unique zones (Korgalzhyn Reserve). Areas with low potential are concentrated in semi-desert areas.

The high potential of the Korgalzhyn Reserve is explained by its unique natural resources and inclusion in the UNESCO list. The low potential of desert zones is due to the lack of infrastructure and climatic limitations.

CONCLUSION

The study of the Teniz-Korgalzhyn Depression area allowed us to identify the key characteristics of its natural and recreational potential, as well as to determine the main advantages and disadvantages in terms of recreation and ecotourism development. The data obtained demonstrate the importance of this region for the sustainable use of natural resources.The Teniz Depression is located in the west of the Kazakh Uplands. Soils vary from dark to light chestnut.

This is due to climate change from moderately dry in the north to desert in the south. The vegetation cover is diverse due to the climate, anthropogenic impact, and habitat. The most valuable natural heritage site is the Korgalzhyn Nature

Reserve, included in the UNESCO list. However, a significant part of the steppe ecosystems remains unprotected, which requires increased monitoring of their condition to maintain the ecological balance.

The assessment of the main components that make up the natural and recreational potential allowed us to divide the territory into zones with high, medium, and low attractiveness for recreation. Low-potential landscapes located in semi-desert areas are characterized by a limited amount of natural resources and low attractiveness for tourism.

The average potential is found in areas with more favorable climatic conditions, especially around large settlements such as Karaganda and Temirtau. High potential is recorded in unique natural areas, including the Korgalzhyn Nature Reserve and Lake Karasor, which makes them promising for the development of ecological and health tourism.

Water resources. Particular attention is paid to the region's water bodies, which play an important role in the conditions of a sharply continental climate. Small lakes and reservoirs are key elements of recreation but require careful use to prevent pollution and degradation of ecosystems.

Recommendations

The following measures are proposed for the effective management of natural resources of the Teniz-Korgalzhyn Depression:

- Identification of priority areas for ecotourism with minimization of anthropogenic impact.
- Regular monitoring of the state of water bodies and vegetation using satellite data.
- Introduction of environmentally sustainable practices in tourism activities, which will preserve unique natural resources and increase the environmental awareness of the population.
- Development of programs for the restoration of degraded lands and reduction of anthropogenic load, especially in agricultural areas.

Scientific results

The spatial and temporal dynamics of land covers were assessed using multi-spectral remote sensing data (NDVI and MNDWI). It was found that in most areas the changes are stable, but in some natural zones, the amplitude of changes reaches 40%. The landscape map constructed based on these data allowed us to assess in detail the dynamics of ecosystems for the period from 1975 to 2024. These results provide valuable information for natural resource management and environmental planning. Ecological and economic status. The analysis showed that extensive farming has led to environmental problems, including soil erosion, pasture degradation, and decreased fertility.

Against the background of these processes, a decrease in the area of arable land is observed. It is necessary to switch to intensive land use with the introduction of innovative technologies to eliminate the negative consequences.

Thus, the results of the study are of practical importance for strategic planning and sustainable development of the region. They will not only help preserve the natural resources of the Teniz-Korgalzhyn Depression, but also increase its tourist attractiveness, promoting the harmonization of the interests of society, the economy, and the environment.

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EVALUATING THE ROLE OF AUTHENTICITY AND SUSTAINABILITY IN SHAPING VISITOR EXPERIENCES IN FARM-TO-TABLE AGRITOURISM

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Abstract: This paper investigates how authenticity and sustainability shape tourist experiences in farm-to-table agritourism and their impact on revisit intentions, particularly in the context of emerging rural destinations. Designed in line with the theoretical framework of the experience economy, a survey of 352 respondents was conducted to compile demographic information and evaluate how experiential elements affected perceived authenticity and revisit intentions, as well as to explore underlying motivational factors. Significant correlations were found through statistical analysis using partial least square-structural equation modeling (PLS-SEM), supported by SmartPLS 4.0.9.2 software to ensure model reliability and validity. The majority of guests were young females, particularly in the 30–39 age range, which suggests a dominant demographic of working-age women whose values and expectations may significantly shape perceptions of authenticity and sustainability in agritourism. These results confirmed robust positive correlations between experiential elements particularly entertainment, aesthetics, education, and escapism and perceived authenticity, which in turn significantly influenced revisit intentions. This sense of authenticity was found to be enhanced by engaging, educational, immersive, and visually appealing activities. Additionally, the perceived environmental impact moderates the relationship between perceived authenticity and both tourist experience and revisit intention. These findings suggest that agritourism operators should design experiences that appeal to young, working-aged women and emphasize sustainability, thereby promoting cultural respect and environmental consciousness. Future research should investigate specific elements of the tourist experience and the long-term effects of perceived authenticity on visitor loyalty.

Keywords: agritourism, authenticity, travel, farm-to-table, environmental sustainability, rural tourism, cultural tourism, visitor loyalty

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INTRODUCTION

A rapidly expanding subset of the tourist industry, "farm-to-table agritourism" connects guests with farmers and their practices while they savour regionally grown food (Peebles, 1995). Many people are interested in this type of tourism because it may bring people closer to the places where their food comes from through immersive and one-of-a-kind experiences (Shah et al., 2020). In recent years, the themes of authenticity and sustainability have played an important role in influencing tourist experiences in agritourism. Travelers seek more than just a vacation; they desire firsthand experiences of authentic farming practices and sustainable businesses. Additionally, they aim to build connections that align with their moral values (Martinus et al., 2024). The increasing trend of farm-to-table agritourism has brought attention to the need for a better understanding of how authenticity and sustainability affect tourist experiences and behaviors, including the likelihood of returning (Yamagishi et al., 2023). In related research, Kamrul Hassan et al. (2023) found that past research on agritourism has mostly focused on evaluating the concept's validity and supportability while neglecting its transactional aspects (Hassan et al., 2023). One of the objectives of this research is to get insight into how these interconnected factors influence the perspectives and intentions of visitors to revisit. Authenticity theory, which focuses on real and spontaneous encounters, provides an appropriate framework for our inquiry. Aligned with this, Zhao et al. (2023) highlight travelers' desire for authentic experiences rooted in local culture and practices. Through traditional farming techniques, locally made products, and direct engagement with farmers, farm-to-table agritourism can demonstrate its authentic nature. Meanwhile, the implementation of sustainable practices like organic farming, waste reduction, and the use of renewable energy sources enhances the authenticity of the tourism experience, meeting the increasing customer demand for environmentally responsible tourism (Buhalis et al., 2023).

This study demonstrates that farm-to-table agritourism can improve visitor experiences by including authenticity and sustainability. The experience economy theory evaluates these encounters based on their aesthetic, instructive, escapist, and entertaining aspects. Additionally, it is hypothesized that tourists would be more satisfied and likely to return to the

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farm if the tourism sector uses sustainable and genuine ways (Baipai et al., 2024). This research aims to help agritourism businesses succeed in the long run by analyzing two important outcome variables: the satisfaction of visitors and their likelihood to return (Yamagishi et al., 2023). The study conducted by Mandić et al., (2023) aims to provide valuable insights for agritourism operators by filling gaps in existing literature and offering empirical evidence on the impact of authenticity and sustainability on visitor experiences (Mandić & McCool, 2023). These findings can influence the creation of initiatives that not only improve the tourist experience but also encourage sustainable practices, therefore supporting growth and long-term sustainability within the agritourism sector.

LITERATURE REVIEW

Theory background

This study seeks to investigate the impact of incorporating authenticity and sustainability on the visitor experience and their likelihood of returning to the farm. It is guided by the experience economy theory (Pine & Gilmore, 1998) and uses standardized measurement concepts for farm tourism. Entertainment will be measured by the enjoyment and engagement levels of farm activities; education by the knowledge and insights gained from sustainable farming practices; escapism by the sense of immersion and escape from daily routines; and esthetics by the aesthetic appeal and ambiance of the farm environment (Chen et al., 2023). The influence of these experiences on visitor happiness can be moderated by their perceived environmental sustainability (Wang et al., 2018), while perceived authenticity (Youn & Kim, 2017) acts as a mediating variable that reflects the sincerity of the farm experiences. This case study looks at how adopting real and sustainable practices in agritourism improves tourist involvement and loyalty thus promoting sustainable development (Martinus et al., 2024). With an eye on exposing the elements motivating visitors to return, the research explores the relationship between these behaviors and visitor experiences.

DEVELOPING HYPOTHESES

The relationship between entertainment experience with perceived authenticity

The activities and interactions that entertain and immerse guests and make their stay enjoyable are their entertainment experience. Agritourism entertainment may include traditional agricultural demonstrations, local cultural events, festivals, and interactive exhibits that engage guests in farm culture and operations (Baipai et al., 2024). As per Pine and Gilmore's idea of the experience economy, entertainment refers to activities that are passively enjoyed and aimed at providing enjoyment to visitors. There is research on entertainment experiences that indicate that genuine and culturally immersive entertainment, such as traditional agricultural exhibits or local cultural performances, might enhance tourists' perceptions by (Montefrio & Sin, 2021). Additionally, research suggests that amusement that is ingrained in local traditions and presented by community members enhances the perceived authenticity of the experience (Pearce & Wu, 2018). This is because visitors place a high value on experiences that accurately represent the region's history and culture. As a result, entertainment activities must adhere to the authentic characteristics of the agritourism setting (Dsouza et al., 2023). Exceptional research has demonstrated that the integration of traditional entertainment forms not only captivates visitors, but also enhances their trust and appreciation of the overall authenticity of the experience (Ponsignon & Derbaix, 2020).

H1. Entertainment experiences can positively influence perceived authenticity.

The relationship between educational experience with perceived authenticity

Agritourism mostly depends on educational experiences to change visitors' impressions of authenticity by means of higher knowledge and appreciation of farming methods (Chen et al., 2023). The observed criteria suggest that educational experiences in agritourism include engaging activities such as farm visits, seminars, and hands-on agricultural activity. The objective of these programs is to provide essential information on both sustainable and conventional agriculture systems (Martinus et al., 2024). These activities are derived from the agricultural expertise and firsthand experiences shared by farmers with guests, offering them a fully immersive and realistic view of everyday farm operations, therefore strengthening the overall image of the farm. Epitomizes genuineness for guests.

In addition, educational experiences that are strongly based on local agricultural knowledge and practices have a considerable impact on the perception of authenticity (Sewell et al., 2017). Visitors who directly learn from farmers and actively participate in genuine farming activities get a deeper feeling for the authenticity of the experience (Zhao & Li, 2023). Drawing a connection to prior study, it is clear that the genuineness of the instructional material is of utmost importance. Genuine educational encounters foster a stronger bond between visitors and the farm, since they are seen as authentic and reliable sources of knowledge. Moreover, incorporating genuine educational components into agritourism has the potential to enhance visitor contentment and commitment. Therefore, comprehending the connection between educational encounters and perceived genuineness is crucial for agritourism providers aiming to establish significant and genuine visitor interactions that promote recurring visits and sustained involvement (Zhao et al., 2024).

H2. The education experiences positively influence perceived authenticity in farm-to-table agritourism.

The relationship between escapism experience with perceived authenticity

The concept of escapism experience is essential to agritourism, as it enables visitors to fully immerse themselves in a distinct environment, thereby influencing the perception of authenticity (Chen et al., 2023). Economic escapism in the context of the agritourism means activities that enable the visitors to ignore all their normal responsibilities and get involved fully into the farm environment (Wojcieszak-Zbierska, 2021). Activities like helping with the harvest or even just

sleeping on the farm could help establish the idea of a farm as a place of adventure and escape. Furthermore greatly influencing the farm's perceived authenticity are immersive events firmly ingrained in the genuine way of life (Mandić & McCool, 2023). Martinus et al. (2024) claimed that when visitors participate in the carried out activities, their behaviors around the farm and local culture that which represents the techniques the farm uses are more real. Moving further from previous research, the credibility of the escapism experience is a critical component in providing authenticity and novelty in an experience, supporting the visitor experience. Realistic and genuine recreational experience empowers people to establish a bond with the farm so as to experience the actuality of rural life (Zhao & Li, 2023).

In addition, truthfulness of escapism experiences have an effect on increased visitor satisfaction and therefore, positive likelihood to revisit (Yamagishi et al., 2023). Therefore, to support the development of agritourism businesses should understand the relationship between perceived authenticity and escapism experiences. Such insights make it easier for them to deliver compelling and authentic visitors experiences that can result in repeat patronage. The proposed charm of the farm arrived at the fact of including real escape in agritourism while guaranteeing that the contractors must have an extraordinary and memorable experience (Rosalina et al., 2021).

H3. The authenticity of farm-to-table agritourism is further enhanced by escapism experiences.

The relationship between aesthetics experience with perceived authenticity

The element of aesthetics should play a major role in the study of agritourism, as it includes two of the vital sense organs, sight and touch which allows one to be surrounded and captivate the feel of the agricultural activity (Chen et al., 2023). The physical appearance or setting of a farm that embraces esthetics in agritourism refers to the design, layout or arrangement of facilities as well as the surrounding environment in view of offering clients a more natural and aesthetic experience (Carneiro et al., 2015). Forced landscapes, barns and other agricultural buildings and superbly groomed fields give the impression of real farming environment.

Moreover, esthetic experiences that reflect the genuine characteristics of the farm and its surroundings significantly boost perceived authenticity. When the visual elements are true to the local culture and agricultural practices, visitors are more likely to perceive them as authentic (Martinus et al., 2024). Linking this to previous research, it becomes clear that the believability of the aesthetic setting is central in the construction of the visitors' impressions. Genuine esthetic experiences are useful in giving to the visitors something real to which they can relate the farm, something that reestablishes their confidence in the credibility of the farm as a tourist destination (Andéhn & L'Espoir Decosta, 2021).

Furthermore, the integration of authentic esthetic it was stated that the integration of artificial aesthetic elements strongly contribute to mass tourist flow and develop its loyalty. Knowledge of the link between aesthetics and perceived authenticity represents the basis for agritourism managers' desire to provide appealing and sincere atmospheres that foster visitors' return (Zhao et al., 2024). These enhancements in authentic aesthetics guarantee clients have a memorable and a avisually appealing view, hence adding value to the appeal of the farm (Kuo et al., 2024).

H4. Aesthetics experience positively influences perceived authenticity in farm-to-table agritourism

The relationship between perceived authenticity with visitor experience and revisit the farm

Authenticity is core to agritourism as it greatly influence all facets of visitor experience and their willingness to go back to the farm. Perceived authenticity captures the ability of a farm-to-table experience to present a genuinely real, reasonable, and believable, positive experience of farming, locally sourced products and culture (Andéhn & L'Espoir Decosta, 2021). Previous research has also posited that the more a visitor feels that their visitors' experiences are actually real, there is increased satisfaction and engagement. Moreover, perceived authenticity is linked to positive visitor experiences, characterized by deeper emotional connections and meaningful interactions with the farm environment (Chen et al., 2023). This relationship is further moderated by another factor, the perceived environmental sustainability (Nonthapot & Watchalaanun, 2024). Organic production methods, sustainable agriculture and environmental management are concepts that visitors learn about and this gives them the comfort they need (Martinus et al., 2024).

Linking this to previous research, the alignment of authenticity with environmental sustainability not only enhances the visitor experience but also reinforces their intention to revisit (Kuo et al., 2024). Furthermore, this problem shows the need for researching how perceived environmental sustainability affects those who own agritourism operations. That is why it emphasizes such forms' blurriness between genuine agriculture and sustainability as important aspects of developing tourists' brand preferences and returning visitors (Madanaguli et al., 2023). When more and more people yearn for a true and natural touch to their trips, the interaction between perceived authenticity and sustainable development represents a critical feature in the formulation of an appealing strategy for agritourism (Martinus et al., 2024).

H5. Farm-to-table agritourism tourists' experiences are positively and significantly impacted by the amount of perceived authenticity.

H6. Perceived authenticity positively influences the intention to revisit farm-to-table agritourism.

The moderation effect of perceived environmental

This is especially important in the context of agritourism because often the perceived environmental impact can actually mediate the effect of the perceived authenticity and visitor experience directly on the intention to visit the particular farm again (Wang et al., 2018). Perceived environmental impact means to what extent the visitors are aware of or value the natural and environment friendly practices followed in the farm. When visitors see, for example, that a farm is focused on minimal environmental impact, on aspects such as organic farming, waste and the conservation of natural

resources, it helps build credibility for the rest of the farm experience (Thongma et al., 2017). Moreover, the perceived positive environmental impact has a positive effect on the visitors' satisfaction based on perceived authenticity of the farm-to-table practices (Buhalis et al., 2023). Linking this to previous research, it has been demonstrated that the perception of a positive environment is substantiated, as visitors who recognize and value sustainability tend to regard their experiences as both authentic and fulfilling. Even more, people will visit the farm since this raises the level of knowledge about the factor that is associated with firmly impressed feelings (Hassan et al., 2024).

Furthermore, understanding the moderating role of perceived environmental impact is thus important for agritourism operators who want to explore means of enhancing the visitors' experience and hence, their repeat visitation to recognise the contingency impact (Zhao et al., 2024). Through meaningful engagement and advocacy of the sustainable image and practices, farms are also able to foster content credibility of the perceived farm products. This not only enhances visitor satisfaction but also visitor loyalty in a farm since the visitor is most likely to visit farms that are environmentally conscious since they are shown a face (Martinus et al., 2024). Such measures guarantee the cohesiveness and effectiveness of the visitor engagement in the long run with practices of the organic farm.

H7. Perceived environmental impact moderates the relationship between perceived authenticity and visitor experience.

H8. Perceived environmental impact moderates the relationship between perceived authenticity and the intention to revisit.

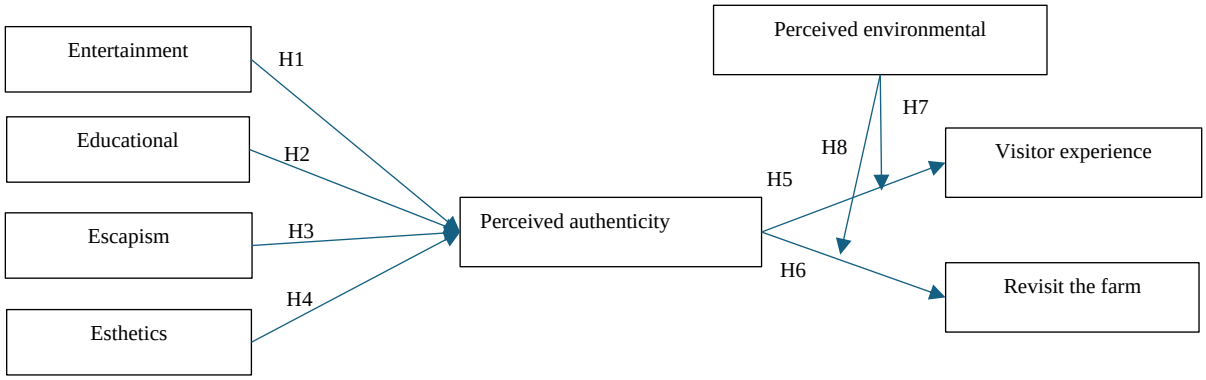


Figure 1. A conceptual framework of the research (Source: Author's systematization, 2024)

METHODOLOGY

Questionnaire development

There are some specific factors that has been employed in an endeavor to formulate a research model for measuring the constructs. For perceived authenticity the measures are the real nature of farm related activities, simple and hereditary farming practices, and real and original local products allure and cultural tour. Visitor satisfaction is quantified in view of the experience economy theory such as entertainment, educational, escapism, esthetic dimensions of experience by level of enjoyment, learning, immersion, visual aspects (Pine & Gilmore, 1998).

Perceived environmental impact, the moderating variable, is assessed by visitor awareness of sustainable practices such as organic farming, waste reduction, and energy conservation (Chen et al., 2023). Lastly, revisit intention is gauged through visitor plans to return and recommendations to others (Zhao et al., 2024). The question items consisted of a literature review of prior investigations in the same field of the tourism industry. Utilising Likert-scale surveys, observational methods, and feedback forms, these constructs provide a comprehensive understanding of how authenticity and sustainability influence visitor experiences and their intentions to revisit.

Data collection and sample size

The research was done by deciding on the 10-time rule on how to assess the minimum sample size In addition, it was used quite often in social research (Wagner & Grimm, 2023). In this guidelines, the sample size require has to be 10 larger than the number count of the measurement model element. This criteria had to be put in place because of the large number of structures and their complexity in order to offer enough statistical power (Hair Jr. et al., 2017). To improve the viability and reduce sample bias, the study set a target of 400 samples for the study. Nonetheless, the actual sample size provided 352 responses, which the research community regards as adequate for analysis, as other comparable studies in the field have produced valid results with similar sample sizes. The data collected to measure the research constructs was carefully crafted with Google Forms, an extensively available and easy-to-use platform. In this template, we were also interested in the perceived authenticity, the visitor experience of the site, the perceived impact of the Site on the environment and finally, the revisit intention also in the following format Likert scale. The Google Forms template was forwarded via a limited viewing link which prevented the invitation to complete the survey to reach people who were not relevant, hence guaranteeing the authenticity of the data that was collected (Regmi et al., 2017).

Data collection in the research occurred in purposefully selected on-farm points that involved fruit orchard farms, Mekong aquaculture regions, rice paddies, and farm flower gardens. These sites were chosen because these represent a broad sample of agritourism. It is noted that authors themselves approached the tourists at these sites briefly explaining the aim of the research and what data are required. The actual content of this first communication was important for

building rapport and for gaining consent. Visitors were to be informed that none of their identifying details would be taken. Those who agreed to participate in the study were then given the link to the Google Forms for the survey either on site or at their leisure (Guimarães et al., 2015).

This approach of data collection allowed the researchers to capture the views from a wide cross section of visitors thereby increasing the reliability and external validity of the study findings. Bias was reduced through direct engagement with participants in the course of the study, thereby making the responses obtained more ethical and above board. Other related studies including analysis of agritourism other regions have used both face-to-face recruitment in addition to online survey with success implying the efficacy of the approach for data collection (Barbieri et al., 2016).

Data analysis

To ensure reliability and validity of the measurement constructs the present research utilizes several statistical techniques of analysis (Ko & Stewart, 2002). Initially, Cronbach's alpha was conducted to determine the test/retest reliability for the survey items. Acceptable Cronbach's alpha value of 0.70 was used for the scales measuring perceived authenticity of products, visitors' experience, perceived impact on environment and willingness to visit the area again.

Following this, a confirmatory factor analysis (CFA) was conducted with a view to confirming the factor structure of the above constructs. CFA facilitated the process of determining whether the data could be fitted onto the hypothesized measurement model, and thus assessing the association between the manifest and the latent variables. Key fit indices, such as the composite reliability, average variance extracted and matrix by (Fornell & Larcker, 1981).

Lastly, the partial least squares structural equation modeling (PLS-SEM) was used to analyse the structural connections between the theoretical constructs. Nonetheless, PLS-SEM should be preferred in explorative research studies or in situations where the complexity of the examined relationships dictates going beyond bivariate models, and PLS-SEM can be used when the sample size is not large and the data are not normally distributed (Hair Jr. et al., 2017); (Hulland, 1999). This method enabled assessment of the direct and moderating effects of perceived authenticity and perceived environmental impact, on the visitor experience and the revisit intention. This enabled the PLS-SEM analysis to provide rather conclusive insights into the strength and significance of these relationships with the help of which it is possible to make practical conclusions and recommendations for agritourism operators.

RESULTS

Sample information collected

From Table 1, the statistical results describe the demographic characteristics of farm-to-table agritourism. Among the participants a relatively higher number were females at 59.37% as compared to male participants at 40.62%. The ages of the respondents were distributed as follows: 26.42% of the respondents were from 18-29 years, 58.52% from 30-39 years and the remaining respondents were above 40 years of age. Of the employed three groups of job positions were noted, of them 19.88% worked in managerial positions, 65.62% were employees and 14.48% were unemployed. Despite the relatively small numbers, females make up more of the employee base, and more so the core working age 30-39 year olds (58.52%) indicates a highly engaged female workforce in the sector. Demographic data explained here allows to shade a light to the structure and changes in the selected sector, as well as to determine the needs of various subsectors of the tourist industry and design proper interventions and policy models (Minikhanova et al., 2024).

Table 1. Descriptive statistics by demographic characteristics (Source: Author's data analysis, 2024)

Demographics	Contents	Frequency	Percentage
Gender			
	Male	143	40.625
	Female	209	59.375
Group age			
	18 - 29	93	26.420
	30 - 39	206	58.523
	40 - 49	14	3.977
	Up 50	39	11.080
Job position			
	Management	70	19.886
	Employee	231	65.625
	Unemployed	51	14.489

Evaluate the reliability of each concept according to Cronbach Alpha

As depicted in Table 2, all Cronbach's alpha values exceed 0.70, confirming robust internal consistency reliability (Nunnally, 1978). Additionally, All the outer loadings are above the minimum cut off level of 0.708 showing a very high reliability of the reflective constructs. Due to multicollinearity bias, the VIF was computed next. Multicollinearity was not seen as a problem in the analysis process, as all the computed VIF statistics are lower than 5 (Sarstedt et al., 2017).

In detail, Cronbach's alpha was 0.739 – 0.775, outer loading was 0.709 – 0.813 and VIF was less then 3. This reduces bias in the research results and increases confidence in the reliability of the measurements the last thing any methodologist or statistician would wish when using their adopted methodological frameworks (Hair Jr. et al., 2017).

Table 2. Cronbach Alpha, outer loadings and VIF value analysis results (Source: Author's data analysis, 2024)

Items	Contents	Cronbach's Alpha	Outer loading	Outer VIF
EN	Entertainment experience	0.739		
EN1	Visitors find traditional farming demonstrations highly engaging.		0.758	1.349
EN2	Visitors perceive local cultural performances as authentic.		0.709	1.370
EN3	Visitors value entertainment that reflects the true essence of the locale.		0.761	1.399
EN4	Visitors appreciate entertainment activities rooted in local traditions.		0.762	1.467
ED	Educational experience	0.752		
ED1	Visitors find farm tours informative and engaging.		0.789	1.564
ED2	Visitors perceive workshops on traditional farming methods as authentic.		0.723	1.286
ED3	Visitors value hands-on learning opportunities with local farmers.		0.794	1.593
ED4	Visitors appreciate educational activities rooted in local agricultural knowledge.		0.721	1.439
EE	Escapism experience	0.767		
EE1	Visitors find staying overnight on the farm an immersive experience.		0.751	1.462
EE2	Visitors believe that engaging in harvester activity is a real way of getting out.		0.774	1.511
EE3	Visitors find a sense of adventure participating in farm activities.		0.775	1.465
EE4	Visitors enjoy programs which are genuine in the sense of what farm life has to offer.		0.767	1.475
ES	Esthetics Experience	0.775		
ES1	Visitors remark on the farm's visually appealing geomorphology.		0.757	1.442
ES2	Visitors perceive traditional farm structures as enhancing authenticity.		0.730	1.429
ES3	Visitors value the natural beauty of the farm environment.		0.813	1.609
ES4	Visitors appreciate esthetic elements that reflect local culture and agricultural practices		0.788	1.576
PA	Perceived authenticity	0.772		
PA1	Visitors find the farm's traditional farming practices to be genuine		0.766	1.450
PA2	Visitors perceive the locally sourced produce as authentic.		0.755	1.412
PA3	Visitors value authentic cultural interactions at the farm		0.793	1.599
PA4	Visitors recognize sustainable practices, such as organic farming, as enhancing authenticity		0.768	1.548
PE	Perceived environmental	0.759		
PE1	Visitors recognize the farm's commitment to reducing its environmental footprint		0.763	1.502
PE2	Visitors appreciate the farm's use of organic farming practices		0.796	1.578
PE3	Visitors value the farm's efforts in waste management and conservation		0.740	1.395
PE4	Visitors perceive sustainable practices as enhancing the authenticity of the farm experience		0.748	1.384
VE	Visitor experience	0.764		
VE1	Visitors enjoy the immersive farm activities		0.773	1.481
VE2	Visitors find the educational experiences valuable		0.742	1.400
VE3	Visitors appreciate the visual appeal of the farm		0.757	1.556
VE4	Visitors feel connected to the farm's authentic practices		0.786	1.473
RE	Revisit the farm	0.755		
RE1	Visitors plan to return to the farm		0.744	1.438
RE2	Visitors intend to recommend the farm to others		0.773	1.480
RE3	Visitors feel motivated to revisit due to the farm's authenticity		0.741	1.384
RE4	Visitors are likely to come back because of the farm's sustainable practices		0.779	1.513

Determination of convergence and differentiation of measurement structures

The model was evaluated using two indices: reliability and concurrent validity. The assessment of reliability was conducted using Cronbach's alpha and composite reliability. Table 2 shows that the Cronbach's alpha values for all constructions were more than 0.7, indicating a high level of internal consistency.

Table 3. Correlation matrix according to Fornell and Larcker (Source: Author's data analysis, 2024)

	CR	AVE	ED	EE	EN	ES	PA	PE	RE	VE
ED	0.843	0.574	0.758							
EE	0.851	0.588	0.457	0.767						
EN	0.835	0.559	0.425	0.473	0.748					
ES	0.855	0.597	0.389	0.380	0.317	0.773				
PA	0.854	0.594	0.474	0.477	0.525	0.446	0.771			
PE	0.847	0.581	0.181	0.065	0.110	0.310	0.184	0.762		
RE	0.845	0.577	0.298	0.272	0.282	0.255	0.337	0.318	0.759	
VE	0.849	0.585	0.118	0.156	0.153	0.450	0.266	0.321	0.066	0.765

Note: Educational experience (ED), Escapism experience (EE), Entertainment experience (EN), Esthetics experience (ES), Perceived authenticity (PA), Perceived environmental (PE), Revisit the farm (RE), Visitor experience (VE), Composite reliability (CR), Average variance extracted (AVE)

Table 3 demonstrates that the Composite dependability (CR) values surpassed the threshold of 0.7, so affirming the dependability of the constructs. The second criteria, the convergent validity, was established by calculating the averaged

variance extracted in the tradition of Fornell and Larcker. The criteria for the suitability of the reflective items based on the value of AVE; when the convergent validity is higher than 0.5 (Fornell & Larcker, 1981). Table 3 shows that all variables had satisfactory converging validity, with an AVE greater than 0.55. These findings provide credence to the study's reasonableness and practicality by demonstrating that the measuring approach is acceptable.

Testing statistical hypotheses

The significance of the indicator measurements is evaluated by the t-value, p-value, as shown in Table 4. Indicators are statistically significant if the t-value exceeds 2.00 (α=0.05) and the p-value is below 0.05 (Schumacker & Lomax, 2004).

Table 4. Results of the analysis of the direct impact relationship of concepts (Source: Author's data analysis, 2024)

Hypothesis	Relationship	Coefficient	Standard deviation	T statistics	P values
H1	EN -> PA	0.297	0.066	4.525	0.000
H2	ED -> PA	0.186	0.055	3.420	0.001
H3	EE -> PA	0.170	0.066	2.585	0.010
H4	ES -> PA	0.215	0.049	4.396	0.000
H5	PA -> RE	0.244	0.062	3.946	0.000
H6	PA -> VE	0.259	0.062	4.161	0.000
H7	PE x PA -> RE	-0.165	0.051	3.254	0.001
H8	PE x PA -> VE	0.169	0.055	3.067	0.002

Note: Educational experience (ED), Escapism experience (EE), Entertainment experience (EN), Esthetics experience (ES), Perceived authenticity (PA), Perceived environmental (PE), Revisit the farm (RE), Visitor experience (VE), Composite reliability (CR), Average variance extracted (AVE)

Table 4 presents the results of the analysis of the direct impact relationships among various concepts in the context of Farm-to-Table Agritourism. The hypotheses tested are as follows: educational experience, escapism experience, entertainment experience, esthetics experience, perceived authenticity, perceived environmental impact, revisit the farm intention and visitors experience (Chen et al., 2023). The analysis reveals that entertainment experience significantly enhances perceived authenticity (coefficient: 0.297, P-value: 0.000). Educational experience also positively affects perceived authenticity (coefficient: 0.186, P-value: 0.001). Escapism experience significantly influences perceived authenticity (coefficient: 0.170, P-value: 0.010), although there is moderate evidence, it can in fact increase perceived authenticity during immersive activities. Additionally, esthetics experience positively impacts perceived authenticity (coefficient: 0.215, P-value: 0.000) which mean that visually appealing environment enhance the perceived authenticity.

Importantly, perceived authenticity significantly positively influences the intention to revisit the farm, with a coefficient of 0.244 (P-value: 0.000). The forecast may be deduced from this that patrons are more likely to revisit a place if they feel they are really getting in touch with something real. Furthermore, the perceived authenticity was found to partially mediate the link between the visitors' farm revisit intention with entertainment, educational, escapism, and esthetics experiences.

This intermediate role conveniently underscores the role of perceived authenticity in making out of numerous experiences an increased likelihood to return (Li & Wang, 2023). Finally, the perceived environmental impact plays the role of a control variable that helps to control the influence of perceived authenticity on visitor experience and the extent of their willingness to revisit (Mandić & McCool, 2023). This implies that the contribution made by perceived authenticity on visitor experience as well as revisit intention is enhanced by the perceived organisational sustainability.

Table 5 presents details on the indirect influence of the experiencer on the tourist experience. Overall, the findings confirm the impact of various kinds of experiences on the perceived authenticity and have shown that PE and PA are the key predictors of visitors' willingness to visit the trail again. This information is crucial for agritourism stakeholders who wish to offer exciting, genuine, and safe tourist experiences that create lasting customer relationships.

Table 5. Results of the analysis of the indirect influence relationship of concepts (Source: Author's data analysis, 2024)

Relationship	Coefficient	Standard deviation	T statistics	P values
EN -> PA -> VE	0.077	0.025	3.026	0.002
EE -> PA -> VE	0.044	0.020	2.149	0.032
ED -> PA -> VE	0.048	0.018	2.742	0.006
ES -> PA -> RE	0.053	0.019	2.749	0.006
ED -> PA -> RE	0.046	0.018	2.598	0.009
ES -> PA -> VE	0.056	0.021	2.682	0.007
EN -> PA -> RE	0.073	0.024	3.062	0.002
EE -> PA -> RE	0.041	0.021	2.008	0.045

Note: Educational experience (ED), Escapism experience (EE), Entertainment experience (EN), Esthetics Experience (ES), Perceived authenticity (PA), Perceived environmental (PE), Revisit the farm (RE), Visitor experience (VE), Composite reliability (CR), Average variance extracted (AVE)

The survey analysis integrates and visualizes the analytical findings relating to the effectiveness of the analytical framework in managing visitors' perceived restoration and their holiday experience, as well as the role of mediated environmental behaviour in shaping this intention.

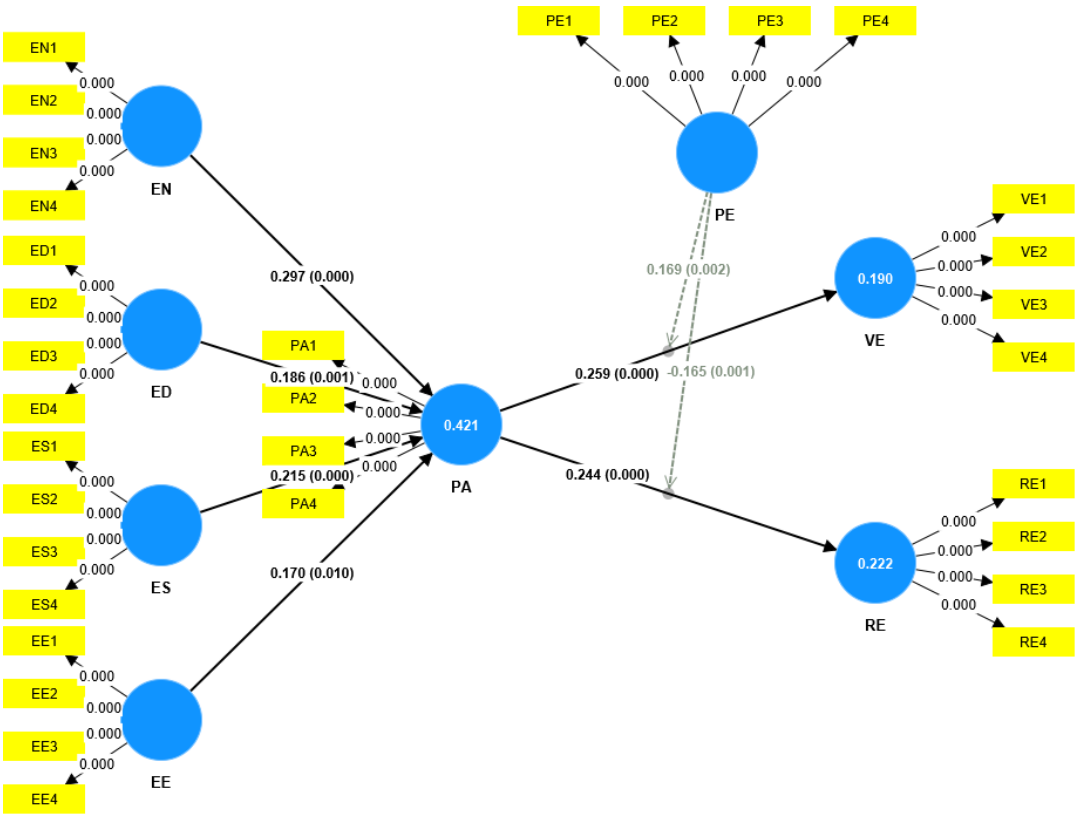


Figure 2. Farm-to-table agritourism authenticity and sustainability evaluation results (Source: Author's data analysis, 2024)

Note: Educational experience (ED), Escapism experience (EE), Entertainment experience (EN), Esthetics Experience (ES), Perceived authenticity (PA), Perceived environmental (PE), Revisit the farm (RE), Visitor experience (VE), Composite reliability (CR), Average variance extracted (AVE)

DISCUSSION

This evaluation focuses on the relationships between experiential components (entertainment, educational, escapism, and esthetics experiences) and perceived authenticity, as well as the moderating role of perceived environmental impact. The results should be discussed in the context of related studies in the tourism field. Such scholarly studies on farm-to-table agritourism in Zimbabwe stress about the authenticity, sustainability with suggestions to step up agritourism activities through the sustainable use of the farm resources. The study offers important information to the stakeholders to help them boost the rate of agritourism development and the findings of the research can act as a benchmark for further studies (Baipai et al., 2024). In China, a study on perceived authenticity and environmental issues focus on the context of village tourism; furthermore the findings indicate that contextual involvement, cultural, and image all have positive effects on satisfaction (Zhao et al., 2024). This study reveals that perceived experience authenticity is associated with entertainment, education, escapism, esthetics mediated experiences. Furthermore, the findings confirm the mediating effect of perceived environmental impact in enhancing the relationship between perceived authenticity and visitors' intention.

First, demographic findings showed that the majority of the participants were female (59.37%), while 40.62% were males. About age, the highest percentage (58.52%) of respondents was in 30 – 39 years, and the second largest (26.42%) in 18 – 29 years. With reference to job status, 65.62% held employee status, 19.88% held management status, the remaining 14.48% were unemployed (Dsouza et al., 2023). These demographics mean a relatively diverse and largely working age female visiting population. This demographic may engage in farm to table agritourism because they are seeking the truth and sustainability. The specific target audience of women in their 30s and 40s are looking for activities that encompass family and education and health with food and farming being the areas of interest (Mat et al., 2024). The leisure activities that would interest the employees in this age group might also as well be a way of temporarily escaping work-related chores while the managers may opt for leisure activities that enable them to have a gripping and more naturalistic break (Lee et al., 2023). The emphasis on sustainability and authenticity in farm-to-table agritourism resonates with their values, encouraging repeat visits and engagement (Kerimbay et al., 2024).

Second, the relationships between various experiential components (entertainment, educational, escapism, and esthetics experiences) and perceived authenticity can be explained by the engaging nature of these activities. In this context, entertainment activities such as traditional farm demonstrations and exercise of cultural troupes expose the visitor to the farm's cultural and operating environment, hence increasing perceived credibility (Montefrio & Sin, 2021). Field sessions in the farm and workshops as well give more information on practices in sustainable and traditional farming making the farm more authentic (Widodo et al., 2024). Escape activities will enable visitors to explore the aspects of the farm culture to the fullest escapades away from their daily activities. The external environment, gardening, and appealing and breathtaking agriculture areas help support the cultural continuation hence the increase in authenticity (Andéhn & L'Espoir

Decosta, 2021). Third, the findings obtained indicate that authenticity has significant impact on the experience of the visitors to farm as well as their willingness to revisit the destination. Those customers who have been engaged in a way that makes them feel like real parts of the farm are more likely to return (Hassan et al., 2024).

Fourth, the results show that perceived environmental effect completely mediates the relationship between perceived authenticity and tourist experience, together with return intention. Farm aesthetics perceived by visitors are influenced by the overall rating of organic farming practices, waste management and conservation strategies of the farm (Yiamjanya et al., 2024). When the tourists perceive that a farm is decreasing their ecological footprint they consider it more genuine (Martinus et al., 2024). Sustainability is generally known to mean efficient management that reflects the true nature of the organizational standards. Today the people care about being environmentally friendly and want to have vacations that take that into consideration (Lee et al., 2023).

Agricultural business that experience sustainable approach makes them appealing to tourists with sensitive environment who are likely to revisit the farm (Esparza-Huamanchumo et al., 2024). As tourists tend to select attractions that align with their values, good attitudes toward the environmental tendencies of the farm increase the influence of perceived authenticity on return intention (Kuo et al., 2024). As a result, perceived environmental impact adds credence to what a farm is doing and what it offers, which fulfils visitors' expectation and hence they get a satisfying experience.

Conclusions and implications (practical, social, future research)

Research results have shown that authenticity and sustainability are pivotal in shaping visitor experiences in farm-to-table agritourism. The greater proportion of respondents was female (59.37%), in the age category 30 to 39 years (58.52%) and employed (65.62%) indicate that youth, working population, especially females play a huge role in tourism.

Several latter experiential elements greatly contributed to perceived authenticity. They rated entertainment experiences (coefficient: 0.297, P-value: 0.000) as the most effective experience type and esthetics (coefficient: 0.215, P-value: 0.000), education (coefficient: 0.186, P-value: 0.001), and escape experiences (coefficient: 0.170, P-value: 0.010) as less effective experience. According to it these results indicate that kind of activities which are engaging, informative, immersive and visually appealing have a great impact on perceived authenticity.

This study further reveals that perceived authenticity plays an intermediate function which has a remarkable impact on the respondents' perceived disposition to revisit the farm (coefficient: 0.244, P-value: 0.000). Thus, visitors would like to return visitors if they feel that they received genuine experiences during their visit. Perceived authenticity in various experiences has a significant influence on the intention to revisit aspect among visitors. Moreover, perceived environmental impact mediates the influences of authenticity and tourist experience and return visitor intention. Cognitive and affective understanding of sustainability increases perceived authenticity, thereby, eco-friendly farms can enhance tourist loyalty.

In summary, these results highlight the importance of encouraging young active women to enhance their participation through active engagement, education, immersion, and appealing experiences while recognizing the perceived authenticity and ecological conscientiousness in repetition and sustained involvement in farm-to-table agritourism.

For purposes of enhancing the visitors' engagement in the farm-to-table agritourism activities, operators can utilize the following activities following the research on authenticity and sustainability.

The targeted clients should be convinced to embrace agritourism because this sector should create products and services that would appeal to these young working young women. This includes the design of the activities as interesting, informative, engrossing and aesthetic activities that increase perceived communication authenticity (Dağ et al., 2023). Four of these experiences; entertainment, education, escapism and esthetics can enhance perceived authenticity by visitors and thus encourage returning visitor (Zhao et al., 2024). Additionally, communicating practices and operation that are more environmentally friendly can help reinforce perceived genuineness as well as visitor commitment which means sustainability as an essential driver of the general visitor experience.

Encouraging the development of real and genuine farm-to-table agritourism enterprises may bring the current disconnect in understanding and value of agricultural cultures and traditions closer to par.

Through young, working aged women, agritourism can enhance this demography to encompass educational and family geared activities which are dear to them (Mat et al., 2024). Furthermore, adopting sustainability practices in agritourism can increase the perceived environment among the tourists, whereby, their behavior change can positively contribute to the achievement of most sustainable development objectives.

Further studies should reveal whether it is certain facets of entertaining, educational, or escapist experience or the esthetic experience per se that cause a higher degree of authenticity to be perceived. Additionally, future research focusing on the level of perceived authenticity that has a positive impact on visitor loyalty and visitation reinforcing the agritourism operations' sustainability could offer more elaborate information (Rauniyar et al., 2021). Exploiting other approaches, further studies can also focus on the impact of different eco-friendly approaches on the authenticity perceptions and the overall experience of the visitors (Riva et al., 2022). Finally, research could be conducted among other target population to find out their needs and motivations to visit agricultural destinations for tourism, which will give a broader insight to target population in the context of agritourism.

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THE ROLE OF E-PROFESSIONAL DEVELOPMENT PROGRAMS IN DEVELOPING DIGITAL TECHNOLOGY SKILLS AMONG PRIMARY GEOGRAPHY TEACHERS

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Abstract: This study explores how e-professional development programs can improve the technology skills of primary school geography teachers given the paced changes happening in education today and the growing importance of technology, in schools. The sample of the study consisted of 223 geography supervisors (educational supervisors), and geography curriculum coordinators, from the Ministry of Education located in Jordan who oversee teachers and offer technical assistance and professional advice. The data of the study were collected using a questionnaire after ensuring its validity and reliability. The results of the study showed that although primary school geography teachers have some abilities, in utilizing technologies there are noticeable deficiencies in more advanced digital skills. This suggests that existing training programs may not adequately cater to the requirements of these educators. Moreover, the research emphasizes shortcomings in teachers' proficiency in fields like digital research, design and handling tools which create obstacles, to using technology effectively in their classrooms and detrimentally affect students' educational experiences. The study suggests making changes to development programs by focusing on improving practical skills and hands on training opportunities, for educators. This will help teachers apply their knowledge in real classroom settings effectively. By enhancing the training materials comprehensively educators can better cater to their students' needs leading to improved standards and academic achievements. Moreover, the study recommends that professional development programs integrate personalized training tracks that cater to the various technological skills of teachers. Tailoring these programs to address specific areas of weakness in teachers' digital skills will ensure more proficient learning experiences. Furthermore, the research advocates for continuous support for teachers, through follow-up workshops and digital resources, to ensure that technology integration is sustained in the classroom. Emphasis should also be placed on fostering a collaborative community where teachers can share knowledge and strategies on using technology in teaching geography effectively. By implementing these suggestions, teachers will not only improve their technological proficiency but will also be better equipped to prepare students for the demands of a rapidly evolving digital world.

Keywords: Geography learning, E-Professional development, digital technology, professional training, geography teachers

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INTRODUCTION

With the explosive development of knowledge and rapid technological changes around the world, education must move alongside this growth, particularly in the area of teacher preparation (AlAli & Al-Barakat, 2024; Artemyev et al., 2025; Al-Ghamdi, 2017). Digital technology has turned into a core factor within the process of education, and this asks that geography teachers be equipped with advanced technological skills that should then be applied to effective use in the classroom (Civís Zaragoza et al., 2021). This situation highlights the importance of electronic professional development programs, which serve as a critical means for enhancing teachers' competencies in employing digital technology.

These programs not only improve teachers' ability to navigate and utilize modern technological tools but also empower them to adopt innovative teaching strategies that enhance educational quality and increase student engagement with the learning material (Davies, 2019; Joshi et al., 2023; Muammar et al., 2023). Electronic professional development programs play a vital role in developing digital technology skills among geography teachers, directly contributing to the enhancement of student learning quality in geographical concepts (Al-Barakat et al., 2023). As digital transformation becomes embedded in modern educational systems, geography teachers must adapt to these changes and continuously refine their skills in using

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technological tools. These programs effectively support this endeavor by providing teachers with the necessary training and resources (Chang & Kidman, 2024; Chin et al., 2025; Montero-Mesa et al., 2023; Taimalu & Luik, 2019). They aim not only to improve teachers' proficiency in handling technology but also to guide them in effectively integrating these tools within the geography curriculum, enriching students' understanding of scientific concepts and their practical applications (Al-Ghamdi, 2017; Schulman & Demantowsky, 2024). This becomes all the more urgent in the education in geography s, where many particular facets of geography require novel forms of teaching aids that would help students comprehend concepts and apply them to real-life situations. Some of the sources are Montero-Mesa et al. (2023) and Taimalu & Luik (2019).

It thus becomes so imperative that digital technology be used to explain and simplify such difficult concepts with virtual simulations, experiments using augmented reality, and interactive videos. Again, geography teachers are supported in how to effectively apply these tools into the classroom through electronic professional development programs that enhance the knowledge of students and make it more applicable to everyday life (Booher et al., 2024; Hannah & Rhubart, 2019; Davies, 2019; Muammar et al., 2023; Naveed et al., 2022). Joshi et al. (2023) cite the aspect of technological empowerment for teachers themselves to develop their digital competencies. Such empowerment will eventually enable them to convert traditional classrooms into vibrant, digital learning environments that are collaborative in approach and assure positive interaction among students to ultimately bring flexibilities and joy in the learning process.

Besides, digital skills development has wider implications in strengthening the pedagogical knowledge of geography teachers to guide students to adopt productive learning behaviors that significantly enhance communication. This comprehensive approach not only positively affects student learning outcomes but also equips students with a deeper understanding of using structural equation modelling to analyze the impact of teachers' technological skills on students' acquisition of essential soft skills, such as communication, representation, and modelling (Çam & Koç, 2024; Huang et al., 2022; Gulnur & Kamshat, 2025; Hanke & Schmalor, 2024; Knecht et al., 2020; Joshi et al., 2023; Park, 2021; Robinson, 2015). Moreover, according to AlAli & Al-Barakat (2024), systematic training has the role of enabling teachers to gain the required competencies and knowledge in the creative use of digital technology in classroom teaching. In fact, the learning of geography will not experience a vital change if the use of technological tools is not rooted in an appropriately framed educational context. Professional development programs, as such, become an integral part of teacher preparedness toward the infusion of technology in geography schooling. Professional development programs teach teachers to develop innovative learning lessons with activities, conduct scientific simulations on digital platforms, and communicate scientific ideas through interactive visual displays (Davies, 2019; Krajňáková et al., 2024; Labianca, 2021; Park, 2021; Robinson, 2015; Smit et al., 2023).

Given the mentioned factors, it can be stated that with the increasing influence of digital technology in the future of education, it is even more important for geography teachers to improve their technological skills. Professional development activities in the electronic medium are very effective in preparing teachers to incorporate technology in their teaching practice. It also helps the teachers to improve on their technical skills in addition to helping them to come up with more creative, exciting and efficient ways of delivering learning materials to the students. Therefore, as the world of education develops, these training initiatives remain vital to ensure that geography education stays current and relevant, while enhancing pupils' understanding of geography, geographical concepts, and their significance in today's world.

LITERATURE REVIEW

E-professional development of geography teachers is, therefore, the cornerstone in furthering digital education. It involves a continuous training program designed to adequately arm educators with the skills needed in the integration of technology into the educational process. These programs provide a variety of training opportunities, including self-paced online courses and virtual workshops, allowing teachers to enhance their abilities without the constraints of traditional training environments (Akram et al., 2021; Aslan & Zhu, 2017). This flexibility alleviates time and financial burdens, enabling educators to adapt to rapidly evolving technological advancements while maintaining their professional commitments (Chung et al., 2020).

E-professional development goes further than the mere acquisition of skills into an appreciation of higher-end technologies, such as LMS and interactive educational software. E-professional development is training that enables integration of modern information and communication technology tools into curricula, while supporting contemporary teaching approaches. The ultimate goal of such programs is to enhance educational quality through teachers being capable of using technology with an aim to increase students' engagement in enriched learning experiences and practices, encouraging self-directed learning and creative thinking (Montero-Mesa et al., 2023; Taimalu & Luik, 2019). Furthermore, e-professional development encourages a collaborative learning environment whereby teachers share experiences with their peers around the world through online communities. This further enhances diversity in experiences and encourages an integrated approach toward educational development. More importance is attached not just on theoretical input but also to practical application, emphasized through a variety of hands-on activities that give real-life experiences for the teacher in effectively using technology within the classrooms-as documented by Aslan & Zhu (2017), and Bahcivan et al. (2019).

Given modern trends in the design of geography curricula, which emphasize experimentation and exploratory learning, expertise with digital technologies becomes a necessary precondition for achieving specified learning goals in geography. Montero-Mesa et al. (2023); Taimalu & Luik (2019) provide several examples of virtual simulation technologies making possible students conducting inquiries in aspects of geography where access to traditional laboratories is impossible, like planetary geography , gravity, and chemical reaction. The e-professional development programs train geography teachers to integrate digital activities into their lessons, thereby supporting the achievement of geography curriculum goals, as documented by Çam & Koç (2024), Chung et al. (2020), Ghafar et al. (2023), Konstantakatos & Galani (2023), Montero-Mesa et al. (2023), Taimalu and Luik (2019).

E-professional development programs offer innovative educational platforms that enhance teachers' abilities to effectively use technological tools to support the teaching of geography in a more interactive and impactful manner. One of the key advantages of these programs is their role in fostering essential geographical skills among students, such as spatial reasoning, which enables them to understand how places are organized and how spatial relationships exist between natural and human phenomena (Chung et al., 2020; Ghafar et al., 2023; Konstantakatos & Galani, 2023; Montero-Mesa et al., 2023). These programs also support skills like map reading and analysis, which are fundamental for interpreting geographic information represented on maps and using it to understand various geographical patterns.

Additionally, these programs enable students to develop their abilities in working with geospatial data through advanced applications like Geographic Information Systems (GIS) (Ghafar et al., 2023; Konstantakatos & Galani, 2023; Montero-Mesa et al., 2023). Such tools are used to analyze and visualize data in fields like urban planning, environmental monitoring, and natural resource management. This approach enhances students' critical thinking, allowing them to comprehend contemporary geographical challenges and propose innovative solutions. Furthermore, tools like virtual globes (e.g., Google Earth) and interactive 3D mapping applications contribute to deepening students' understanding of geographical phenomena by enabling them to visualize locations and analyze their developments over time. These skills are particularly significant in light of global transformations that necessitate educational curricula capable of keeping pace with modern demands, such as the updates made to geography curricula in Jordan, which emphasize these skills to prepare students for future challenges (Chung et al., 2020; Ghafar et al., 2023; Konstantakatos & Galani, 2023; Montero-Mesa et al., 2023).

Virtual field trips and augmented reality (AR) simulations represent practical examples of how technology can be utilized to stimulate active learning. These activities the place, help which the in students turn to enhances explore the geographical students' concepts experience in the realistic subject manner and without well their having For interest to example, in physically students it go can as to visit the Amazon rainforest virtually or tour the Egyptian pyramids, which will help to make learning more interesting and engaging (Labianca, 2021; Park, 2021). Moreover, these programs enhance teachers' ability to deliver diverse and tailored educational content that meets the varying levels of students, ensuring equal learning opportunities for those in different areas, whether in major cities or rural regions. Notably, these efforts align with global educational reforms aimed at making education more inclusive and focused on meeting the demands of the 21st century (Konstantakatos & Galani, 2023; Labianca, 2021; Park, 2021; Robinson, 2015). In conclusion, e-professional development programs represent an effective means of supporting geography education, not only by empowering teachers to use technology efficiently but also by equipping students with essential life and professional skills. These skills enable them to contribute positively to their communities and address global challenges with confidence and competence.

Through these programs, teachers learn to use mobile devices and educational apps to strengthen these skills, leveraging digital measurement applications or simulation programs that allow students to predict outcomes before conducting experiments (Campbell et al., 2020; Montero-Mesa et al., 2023). Building on current trends in geography curriculum development that prioritize experimentation and exploration, e-professional development is vital for enhancing digital technology skills among geography teachers. For example, students can explore ocean depths or study tectonic movements using virtual reality technologies, broadening their learning experiences without leaving the classroom (Bahcivan et al., 2019).

Furthermore, these programs enable teachers to leverage technology to promote collaborative learning. In geography classes, students can utilize digital collaboration tools to share ideas and work on joint projects, thereby enhancing their communication and teamwork skills. This aligns with the goals of geography curricula, which aim to develop life skills alongside scientific knowledge (Denieffe, 2020; Méndez et al., 2022). Field studies carried out on various issues in developing digital technology skills in current learning environments signal the rise of interest in technology integration in education. For instance, Al-Barakat et al., (2023) talks about the impacts of collaborative versus individual online training programs on physics teachers. From his results, collaborative training appears to be more effective than individualistic training in developing digital technology skills among physics teachers. This pegs the imperatives further for ensuring collaboration among teachers in digital professional Development programs, hence nurturing professional learning communities which can move with the times of technological advancement.

Along the same line, Al-Ghamdi (2017) found that digital training works best in preparing teachers to design electronic tests. In the process, digital training outperformed traditional training in impact. These findings expose the need for incorporating digital training into professional development programs as ways to fix advanced technological skills into modern education. Aveed 2022, demonstrates that digital training significantly helps the teacher in effectively managing virtual classrooms and enhances cognitive and practical skills of educators in dealing with digital learning environments. Thus, it has proved the importance of integrating technology for the facilitation of interactive, flexible learning environments. The study by Al-Zahrani & Ali (2018) presented a model for developing technological competencies among Arabic language teachers through a specialized digital training program, showing notable improvements in teachers' abilities to utilize digital tools. This confirms the need for training programs tailored to different educational specializations to address the specific requirements of each field. Joshi et al. (2023) explored the effect of classroom practices in utilizing communication tools, collaboration skills, digital skills, and software on students' communication behaviors while teaching mathematics. Through an online survey among 466 mathematics teachers in Nepal, they found a very low level of digital skill transformation; therefore, the practices that enhance the use of communication tools and collaboration skills among teachers indeed affect the communication behaviors of students.

Apart from that, Joshi et al. (2023) accentuated that professional development programs would contribute to developing digital technology skills and develop a digital learning strategy that would increase the use of digital communication skills and software for improving student learning. This view is further reiterated by Muammar et al. (2023), who observed that

digital tools have directly influenced teaching quality and positive learning outcomes, underlining the need for a wider integration of technology into educational curricula. Globally, Civís Zaragoza et al. (2021) pointed to the development of teacher competencies in the digital age as a major ongoing priority and targeted innovative training strategies for teachers that will enable them to maximize the full potential of current technologies. Baysan & Cetin (2021) reported a review of how education switched to remote mode in the wake of the COVID-19 pandemic, revealing that successful implementation depended much on the adaptability of teachers to digital tools and technical skills to manage the setbacks of e-learning effectively. Through these studies, it is clear that digital professional development is a key element in developing teachers' technological skills, which is crucial for improving the quality of education and adapting to the challenges of education in the digital age. Therefore, integrating technology into teachers' professional development programs is an essential step to enhance the educational process and improve students' academic performance.

Research problem

The changes in e-learning that have occurred in the last two years during the COVID-19 pandemic have presented a number of difficulties for primary school geography teachers in Jordan in terms of how to integrate the digital resources into their teaching effectively. Traditional educational systems are finding it difficult to meet the current technological demands thus creating a gap between the digital skills needed for today's classrooms. The research done by Joshi et al. (2023) and Muammar et al. (2023) has revealed that there is a critical need for teacher training programs to prepare future teachers for the 21st-century classroom. To achieve this, the Ministry of Education in Jordan in conjunction with the National Center for E-Learning has provided several programs that have tried to improve the technological knowledge of geography teachers through technology assisted measures and training courses. However, there is still a research gap concerning the effectiveness of the e-professional development programs targeting the development of digital skills for primary school geography teachers in Jordan. While studies have addressed general teacher training programs and instructional technology, they have not sufficiently focused on the particular digital skills needed by geography teachers.

This research gap highlights the necessity to improve the teachers' technological knowledge and competencies to enhance the quality of teaching and learning. Despite the several professional development programs that have been offered, there is little research that has focused on the effects of such programs on the digital skills of geography teachers in Jordan. The importance of this research is that it has the possibility of bridging the research gap and thus understanding how e-professional development programs meet the needs of geography teachers. The present study will try to establish how these programs help to improve the technological skills of the teachers and in turn the quality of teaching.

Also, the study will focus on the part played by these programs in meeting the problems that geography teachers face in meeting the technology needs and the dynamic nature of the education system. This study is significant as it provides useful information regarding how professional development programs can be designed in a way that they address the needs of geography teachers. Through assessing the efficacy of such programs, the study seeks to offer practical suggestions on how geography teachers' digital skills may be enhanced in the context of Jordan. Therefore, the research question guiding this study is: *What is the role of e-professional development programs in developing digital skills among geography teachers, as perceived by educational supervisors and curriculum coordinators in geography?*

METHODS AND PROCEDURES

1. Participants

The sample for this research includes 223 supervisors and coordinators of geography subjects, decided on the usage of a simple random sampling technique. This method guarantees that there may be no bias in participant choice, thereby improving the credibility of the consequences received. The sample consists of both geography subject supervisors and curriculum coordinators, making sure complete illustration of diverse academic and professional stories. Participants had been drawn from extraordinary academic levels, ranging from kindergarten to secondary schooling, which covers all age businesses and educational classes inside the northern regions of Jordan. Criteria for player selection included years of experience in instructional supervision, educational qualifications, and participation in expert improvement applications.

As for the demographic characteristics of the sample participants in terms of their gender, academic qualifications, and teaching experience, they were graphically represented in Figure 1.

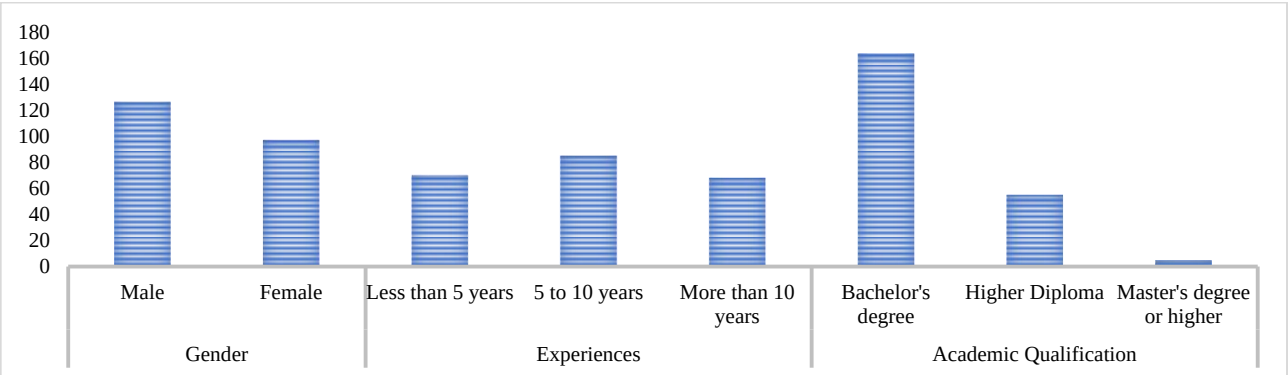


Figure 1. Distribution of study sample participants by gender, academic qualification, and teaching experience

More specifically, Table 1 clarifies the distribution of participants through gender includes 126 male respondents (56.5%) and ninety seven female respondents (43.5%). In phrases of tutorial qualifications, 163 respondents (73%) hold a bachelor's diploma, fifty five respondents (24.7%) preserve a grasp's diploma, and five respondents (2.30%) maintain a doctoral diploma. Regarding years of enjoy, 70 respondents (31.4%) have between 1 and five years, eighty five respondents (38.1%) have between 6 and 10 years, and 68 respondents (30.5%) have extra than 10 years of revel in. This distribution displays the range of backgrounds and academic wishes the various members, contributing to the evaluation of the impact of expert improvement packages on teachers' digital capabilities.

Table 1. Demographic Characteristics of the Study Sample

Variables	Categories	Frequency	Percentage (%)
Gender	Male	126	% 56.5
	Female	97	% 43.5
Experiences	Less than 5 years	70	% 31.4
	5 to 10 years	85	% 38/1
	More than 10 years	68	% 30.5
Academic Qualification	Bachelor's degree	163	% 73.00
	Higher Diploma	55	% 24.7
	Master's degree or higher	5	% 2.30

2. Instrument of the study: The research tool aims to investigate how electronic professional development courses can improve the technology skills of geography teachers. The survey was created by drawing from theoretical resources well as the researchers' own teaching experiences, in geography and digital technology. As a result the first draft of the survey contained 55 questions rated on a five point Likert scale. The scale had these choices available, for selection. The options, on the scale included "high" with a rating of (5) "High" rated as (4) "Moderate" scoring (3) "Low", with a score of (2) and "Very Low" marked as (1). The items were grouped into four domains as outlined below:

3. Domain One: Digital Usage: This domain covers 14 items centered around the abilities needed by geography educators to employ digital technology in their teaching practices. To evaluate teachers' skills in operating and overseeing devices well as handling tasks, like uploading and downloading files or using Office software and multimedia tools. It also assesses their proficiency in utilizing resources like email, social media and blogs - skills that're crucial for improving communication and efficiency, within digital learning settings.

3.1. Domain Two: Digital Research: In this domain of study are 10 items that gauge the skills of geography educators in finding and retrieving information on the internet using search engines and keywords efficiently. The evaluation also looks at how they can navigate through websites and research libraries and make use of technology to interact with different educational tools, like video calls and online activities. This domain plays a role in enhancing the standard of learning by strengthening teachers' capacity to locate suitable educational resources.

3.2. Domain Three: Digital Design: This domain involves 10 items centered on developing resources for geography education such as crafting digital teaching materials and producing engaging videos and presentations interactively. It also includes designing programs for learning and support materials that engage with content. Even though this domain plays a role in offering approaches to education the data suggests that there is room for improvement, in enhancing geography teachers' abilities in creating impactful digital learning content effectively.

3.3. Domain Four: Digital Management: In this domain of study are 12 items centered on overseeing education in the field of geography. It includes abilities such, as handling sites and collections encouraging conversations, within digital learning communities and scheduling activities and duties using digital resources. This domain also highlights management of platforms and interactive games creating project centered learning methods to boost imaginative thinking and evaluating digital learning information to track student advancement. Furthermore, encouraging the arrangement of workshops to educate educators and learners on the utilization of digital resources while also cultivating online learning communities to improve engagement and cooperation. Lastly advocating for learning by combining teaching approaches with digital innovations.

4. Validity and reliability: In order to validate the instrument effectively and reliably for its intended purpose and audience, in the field of geography education and digital technologies a group of 13 university professors were consulted to review the questionnaire provided. Their valuable input and insights prompted revisions to be made such as clarifying any confusing items rectifying grammatical mistakes and eliminating questions that were deemed unnecessary or unsuitable by a majority consensus of at least 30 %, among the experts involved. Consequently a total of 9 items were removed from the original questionnaire version. This iterative process culminated in the revised version consisting of 46 crafted items.

After making these adjustments and modifications as suggested by the reviewers feedback we proceeded to carry out a study involving a group of 20 observers who were not part of the original research sample. The purpose was to evaluate the reliability and accuracy of the tool by examining various factors such, as Composite Reliability (CR) and McDonalds Omega to gauge the soundness of the constructs. Analysis process clarifies the Omega values, for McDonalds fell between 0.82 and 0.85 with CR values ranging from 0.80 to 0.86. These values exceeded the recommended threshold of 0.70, indicating strong internal consistency. The Average Variance Extracted (AVE) values ranged from 0.68 to 0.78, surpassing the minimum

requirement of 50%, confirming that the tool's latent variables are well-aligned. This criterion is satisfied because the loading factor values are higher than the required minimum. These results validate the scales' validity and reliability (AlAli, 2020).

5. Data Collection and analysis

Upon creating the survey and verifying its accuracy and consistency through methods the researchers secured formal consent, from the Ministry of Education in Jordan to gather information regarding geography supervisors at every level of education starting from early childhood education to high school. This authorization was crucial in guaranteeing the thorough implementation of the research encompassing geography supervisors, across levels. A random group of 123 supervisors was chosen for the study. The researchers put together a roster of supervisors' names and selected participants at random to make sure there was a mix of supervisors, from educational areas. The questionnaires last iteration was circulated digitally in the semester of the year 2023 2024 with detailed and thorough guidelines to help participants grasp the queries and give precise responses effectively. After gathering the surveys and organizing them with numbering, for record keeping the information underwent analysis through the use of Statistical Package for the Social Sciences (SPSS). Descriptive statistics were applied to uncover and interpret frequencies, percentages, averages and standard deviations. This examination enabled the researchers to draw conclusions based on the participants' feedback laying groundwork, for investigating the study's main query.

FINDINGS OF THE STUDY

This study aims to uncover the role of e-professional development programs in developing digital skills among geography teachers, as perceived by educational supervisors in geography education. To achieve this, means and standard deviations were calculated for the role of professional development programs in enhancing digital technology skills among geography teachers, specifically in the dimensions of digital usage. The results of the data analysis for each dimension were presented separately, as follows:

1. First Dimension - Digital Usage

This dimension includes 14 items related to the role of professional development programs in enhancing digital usage skills among geography teachers. These items were graphically represented in Figure 2 and Table 2.

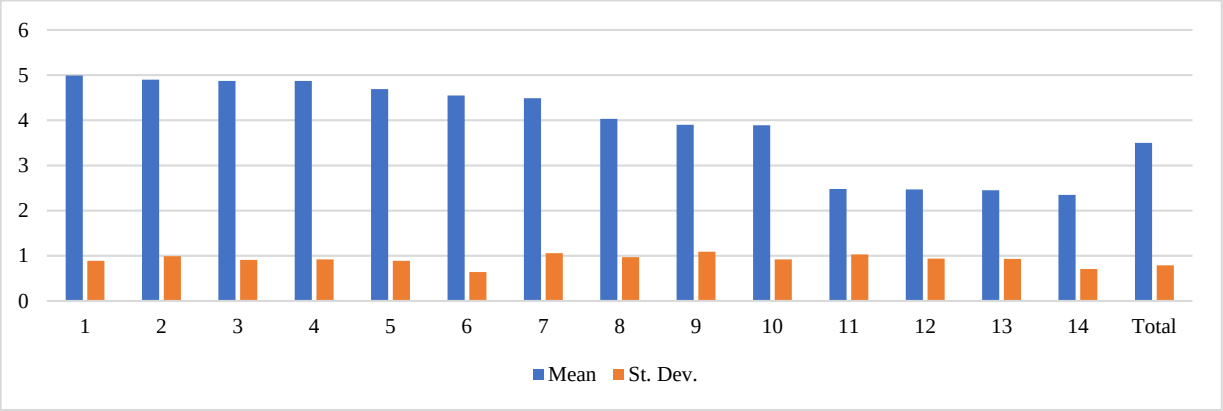


Figure 2. The role of e-professional development programs in enhancing digital usage skills

Table 2. Data analysis related to participants' responses of the role of E-professional development programs in enhancing digital usage skills

No.	Items	Mean[1]	St. Dev.	Rating
1	Effectively turns on and off the computer and its peripherals.	4.99	0.89	High
2	Uses digital screen technologies.	4.90	0.99	High
3	Installs and uninstalls various programs on the computer.	4.87	0.91	High
4	Copies, pastes, and shares research links.	4.87	0.92	High
5	Sends and receives emails effectively.	4.69	0.89	High
6	Downloads and uploads files to and from the internet.	4.55	0.64	High
7	Uses social media platforms like Facebook, Twitter, and Instagram.	4.49	1.06	High
8	Creates, organizes, compresses, and decompresses files.	4.03	0.97	High
9	Utilizes Office programs such as Word, Excel, and PowerPoint.	3.90	1.09	High
10	Exports digital data to specified recipients.	3.89	0.92	High
11	Manages and uses blogs and wikis effectively.	2.48	1.03	Moderate
12	Interacts with digital learning systems such as Google Classroom and Moodle.	2.47	0.94	Moderate
13	Uses multimedia programs such as audio, image, and video editing software.	2.45	0.93	Moderate
14	Uses chat rooms for interaction and lesson organization.	2.35	0.71	Moderate
Total		3.50	0.79	Moderate

[1] To facilitate the interpretation of results, the following grading scale was adopted: High rating: if the mean is between 3.67 and 5.00; Medium rating: if the mean is between 2.34 and 3.66; Low rating: if the mean is below 2.33

Table 2 reveals that the average scores of the participants reached 3.50, indicating that the level of digital skills among geography teachers can be classified as "average." This finding highlights a moderate need for enhancing professional

development programs, as the current skill level does not fully align with modern requirements for integrating technology into education. Within this context, the table shows that certain essential skills received notable appreciation. For instance, the ability to operate and shut down a computer attained the highest average score of 4.99, reflecting the teachers' exceptional proficiency in this area. Similarly, the skill of using digital screen technologies garnered a high average of 4.90, suggesting that teachers are well-equipped to utilize this technology effectively, facilitating the delivery of educational content in innovative ways. Moreover, the ability to send and receive emails scored an average of 4.69, demonstrating the teachers' efficiency in employing modern communication tools, which underscores their strong capacity to engage with information technology.

Additionally, teachers exhibited a strong competency in installing and uninstalling software and sharing links, achieving a high average score of 4.87. This illustrates their capability in navigating essential digital tasks. Furthermore, there was notable development in the skills related to downloading and uploading files, which showed a high average score of 4.55, indicating that teachers can manage digital files effectively, thereby enhancing their access to educational resources.

However, an examination of the items with lower scores -specifically those rated 2.47 and below-reveals critical areas for improvement. For instance, the skill of managing digital learning systems, such as Google Classroom and Moodle, received an average score of 2.47, highlighting a significant gap in competency that necessitates targeted training in this area. Similarly, the average score for using multimedia software was 2.45, underscoring an urgent need to enhance teachers' abilities in utilizing these advanced digital tools. Lastly, the skill of using chat rooms recorded an average score of 2.35, indicating a deficiency in leveraging these tools for effective interaction and lesson organization.

2. Second Dimension - Digital Research

This dimension consists of 10 items that address the impact of professional development programs on enhancing digital research skills among geography teachers, presented in descending order, as shown in Figure 3 and Table 3.

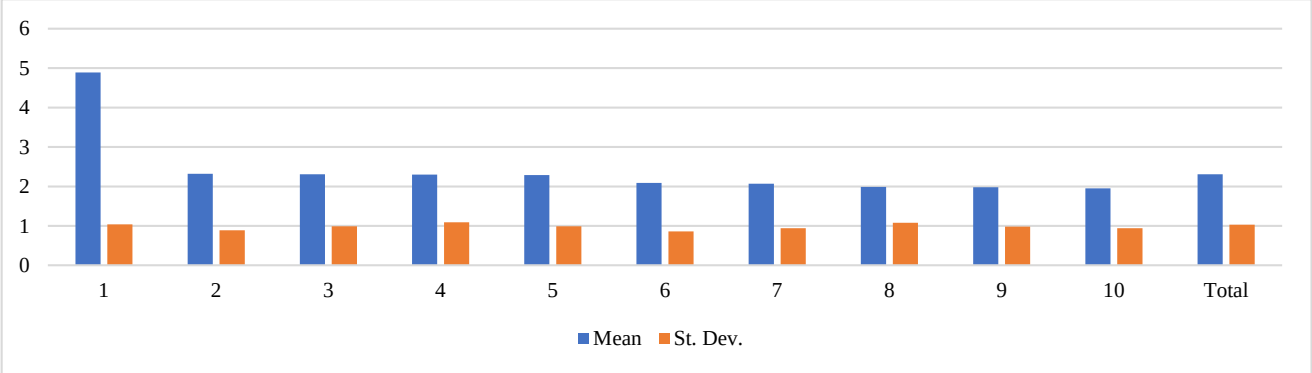


Figure 3. The Role of Professional Development Programs in Enhancing Digital Research Skills

Table 3. Data analysis related to participants' responses of the role of professional development programs in enhancing digital research skills

No.	Items	Mean	St. Dev.	Rating
1	Finds note-taking tools and shares them with students.	4.89	1.04	High
2	Uses text messaging tools to communicate with students.	2.32	0.89	Low
3	3. Conducts effective searches on search engines like Google and Yahoo.	2.31	0.99	Low
4	Browses websites of research libraries specializing in social studies.	2.30	1.09	Low
5	Searches for suitable electronic activities and infographics for teaching social studies.	2.29	0.99	Low
6	Searches for diverse educational resources such as video conferences to integrate them into lessons.	2.09	0.86	Low
7	Participates in relevant educational forums related to social studies.	2.07	0.94	Low
8	Tracks new releases and software in the field of teaching.	1.99	1.08	Low
9	Identifies appropriate keywords to access required information in the research scope.	1.98	0.98	Low
10	Identifies websites dedicated to teaching social studies.	1.95	0.94	Low
Total		2.31	1.03	Low

Table 3 presents a comprehensive analysis of the impact of electronic professional development programs on enhancing digital research skills among geography teachers. The results reveal a concerning decline in teachers' effectiveness in this domain, with an overall average score of 2.31 and a standard deviation of 1.03. This indicates significant variability in the application of digital research skills across the teaching population. Although the first item, which pertains to the use of note-taking tools and their sharing with students, received the highest rating of 4.89, this still suggests that the integration of these digital tools is limited. This finding underscores an urgent need for additional training focused on more effectively incorporating these tools into teaching practices. In contrast, the average score for other items remains notably low; for instance, the use of texting tools for communication scored only 2.32. This highlights a weakness in teachers' utilization of digital technology to enhance educational communication, a critical area that necessitates strengthening within training programs.

Furthermore, the results indicate that teachers face challenges in effectively utilizing digital research tools, particularly search engines such as Google and Yahoo, which received a low rating of 2.31. This deficiency points to a lack of fundamental research skills, which may hinder teachers' ability to stay updated with current educational resources. Additional items related to visiting specialized sites, such as electronic research libraries (2.30) and searching for electronic

educational activities (2.29), further illustrate a gap in teachers' engagement with specialized electronic resources. This limitation restricts their ability to leverage digital content that could enrich their educational practices, highlighting the necessity for enhanced practical training focused on effectively utilizing these tools and resources.

Moreover, items concerning participation in educational forums (2.07) and the use of appropriate keywords (1.98) reflect teachers' struggles to engage with digital educational communities and employ advanced search strategies. These findings confirm that teachers require intensive training to interact more effectively with digital resources and to develop robust research skills, including the formulation of advanced search strategies.

3. Third Dimension - Digital Design

This dimension includes 12 items related to the role of professional development programs in enhancing digital design skills among geography teachers, presented in descending order, as illustrated in Figure 4 and Table 4.

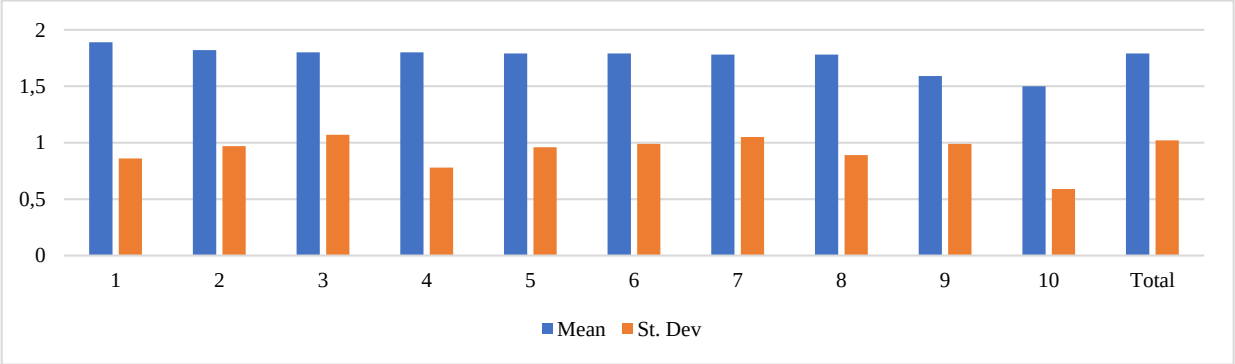


Figure 4. The Role of Professional Development Programs in Enhancing Digital Design Skills

Table 4. Data Analysis Related to Participants' responses of the role of professional development programs in enhancing digital design skills

No.	Items	Mean	St. Dev	Rating
1	Designs educational infographics and digital posters.	1.89	0.86	low
2	Designs a digital lesson plan in geography education.	1.82	0.97	low
3	Creates digital blogs to provide interactive dialogue space with students.	1.80	1.07	low
4	Designs interactive educational videos for social studies.	1.80	0.78	low
5	Develops impactful presentations using Office programs.	1.79	0.96	low
6	Develops various digital activities for students in social studies.	1.79	0.99	low
7	Designs enrichment and remedial digital programs for social studies.	1.78	1.05	low
8	Designs interactive digital textbooks from multiple sources to support educational content.	1.78	0.89	low
9	Creates interactive audio and visual files for social studies.	1.59	099	low
10	Designs diverse assessment tools such as tests and tasks to evaluate students.	1.50	0.59	low
Total		**1.79**	**1.02**	**low**

Table 4 analyzes participants' responses regarding the role of professional development programs in enhancing digital design skills among geography teachers. The overall average score across all items is 1.79, indicating a low level of competence in the digital skills acquired. This average serves as a warning about the limited impact of these programs, highlighting the urgent need for a comprehensive review of the training methodologies employed.

Examining the means for individual items reveals that "designing digital lesson plans in geography education" received an average score of 1.82. This suggests that teachers lack confidence in their ability to create interactive lesson plans, underscoring the critical need for more effective tools and strategies to leverage technology in their teaching practices.

Additionally, items related to "designing digital blogs" and "creating interactive educational videos" both recorded averages of 1.80. This demonstrates that teachers struggle to utilize these tools effectively to enhance student engagement. Given the integral role these media play in modern education, the absence of necessary skills to use them appropriately presents a significant obstacle to improving the learning experience. The table further reveals that other items, such as "designing impactful presentations using Office programs" and "developing diverse digital activities," received averages of 1.79 and 1.78, respectively. These results indicate that teachers lack the requisite skills to produce engaging digital content, which could negatively affect student participation in the educational process. Finally, the item with the lowest average, "designing assessment tools such as tests and assignments," recorded a score of 1.50. This reflects a clear gap in teachers' competence in the area of digital assessment. The low rating highlights their inability to design assessment tools that align with modern digital education standards, potentially undermining the accuracy of measuring learning effectiveness.

4. Fourth Dimension - Digital Management

This dimension encompasses 12 items that pertain to the influence of professional development programs on improving digital management skills among geography teachers, presented in descending order. Figure 5 and Table 5 illustrates this data. Table 5 analyzes the impact of professional development programs on the digital management skills of geography teachers, revealing significant deficiencies. All twelve assessed items recorded low average scores, indicating that current training programs inadequately equip teachers with essential skills. The overall average score recorded was 1.73, with a

standard deviation of 1.07, reflecting a consensus on insufficient digital competencies among participants. This dissatisfaction may hinder teachers' ability to integrate technology effectively into their practices.

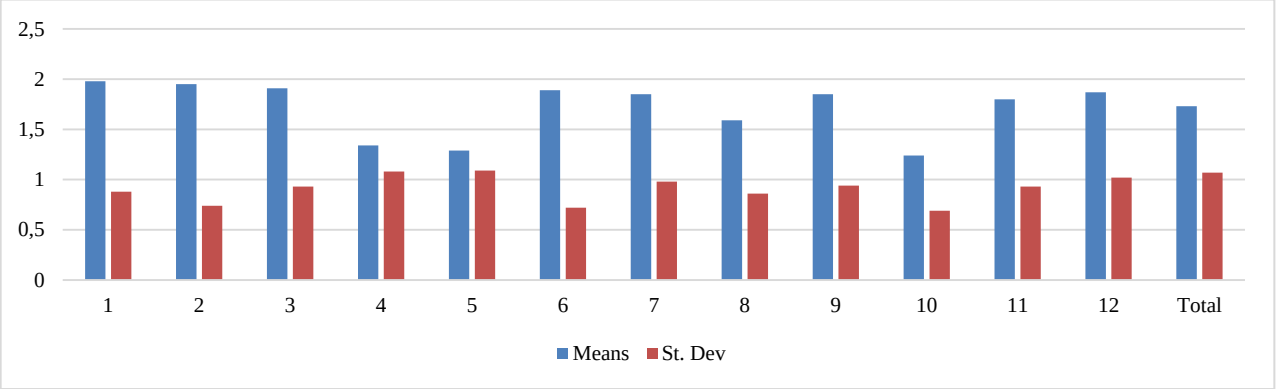


Figure 5. The Role of Professional Development Programs in Enhancing Digital Management Skills

Table 5. Data analysis regarding participants' responses on the role of professional development programs in enhancing digital management skills

No.	Items	Means	St. Dev	Rating
1	Manages digital educational sites for geography.	1.98	0.88	Low
2	Organizes and manages digital portfolios for geography.	1.95	0.74	Low
3	Effectively manages discussions among digital learning groups.	1.91	0.93	Low
4	Uses digital tools to manage time and tasks in teaching geography.	1.34	1.08	Low
5	Effectively and efficiently manages digital learning platforms.	1.29	1.09	Low
6	Manages interactive digital educational games for teaching geography.	1.89	0.72	Low
7	Develops project-based learning strategies to enhance creative thinking using technology.	1.85	0.98	Low
8	Analyzes digital learning data to monitor student progress and make informed educational decisions.	1.59	0.86	Low
9	Organizes digital workshops to train teachers and students on effective use of digital tools.	1.85	0.94	Low
10	Creates digital learning communities to enhance interaction between students and teachers.	1.24	0.69	Low
11	Employs blended learning by integrating traditional learning methods with digital technologies.	1.80	0.93	Low
12	Stimulates creativity through the use of technology tools, such as digital design software.	1.87	1.02	Low
Total		**1.73**	**1.07**	**Low**

Among the assessed items, "managing digital educational sites" recorded the highest average score of 1.98, still within the "low" category, suggesting limited effective strategies for utilizing these platforms. "Organizing digital portfolios" recorded an average score of 1.95, and "managing discussions" recorded 1.91, highlighting challenges in facilitating digital interactions. The item "time and task management" recorded an average score of 1.34, indicating a troubling inadequacy in using digital tools for organization. "Managing interactive educational games" and "project-based learning strategies" recorded average scores of 1.89 and 1.85, respectively, showing a lack of innovative methods to enhance engagement.

"Learning data analysis" recorded an average score of 1.59, indicating limited capability to use data for informed decision-making. "Organizing digital workshops" scored 1.85, suggesting a need for more opportunities to share digital knowledge. Conversely, "creating digital learning communities" recorded the lowest average score of 1.24, reflecting inadequate efforts to build collaborative environments. Lastly, "blended learning" and "stimulating creativity" recorded average scores of 1.80 and 1.87, emphasizing the need for balanced integration of traditional and technological methods to foster creativity.

DISCUSSION

1. Discussion of the Results of Domain One

The findings, from the assessment show that geography teachers have varying levels of skills ranging from average to high competence levels which serve as a strong groundwork for their abilities in this area. Nevertheless these skills may not be adequate to address the complexities in education. The statistics indicate that fundamental abilities like operating computers and utilizing screens rank high on average indicating that teachers are proficient in integrating technology into their day, to day activities. However just having those skills is not enough, in today education scene. We need to incorporate creative methods that go beyond the tactics too. Teachers need to be adept, at using tech tools to provide notch educational material that meets the students' requirements. There are skill gaps, in managing educational systems that emphasize the importance of reviewing professional development programs. With the growing dependence on platforms such as Google Classroom and Moodle it is essential for teachers to gain an understanding of these tools. From what I have seen a lot of teachers feel hesitant to use these platforms because of training and resources. This gap highlights the requirement, for tailored workshops and training sessions that enable teachers to navigate these systems effectively.

Moreover the findings highlight the importance of improving proficiency in utilizing multimedia applications. These resources play a role, in promoting engagement between students and educational material. If educators lack the ability to leverage these tools it hinders their capacity to captivate and inspire learners. The incorporation of multimedia into teaching not enhances the journey but also aids in fostering a lively and participatory academic setting. Continuous assistance, in this domain is imperative to empower teachers in employing resources.

The restricted utilization of online chat platforms highlights the difficulties, in encouraging engagement between educators and learners. The incorporation of communication channels is essential for cultivating an setting. As, per the writers viewpoints enabling the use of tools encourages engagement enabling students to share their thoughts and queries promptly and smoothly. This discovery is, in line with patterns (Denieffe, 2020) well as the works of Méndez et al., 2022 and Monterro Mesa et al., 2023 that highlight the significance of improving these abilities as a key focus in professional growth initiatives to foster solid connections, between educators and learners. According to the information provided above the findings, in this area do not align with research (AlAli et al., 2024; Alali & Al-Barakat, 2022; Aslan & Zhu, 2017; Bahçivan et al., 2019; Birgin et al., 2020) which stress that the creation of development initiatives should be a key priority. These efforts should focus on training and continuous assistance. Such programs need to be tailored to address the needs of educators in the realm empowering them to enhance their digital competencies in line, with contemporary standards. Enhancing teachers' skills will have an effect, on the quality of education and students' achievements in the years to come.

2. Discussion of the Results of Domain Two

The findings regarding research abilities suggest that online professional development courses have not successfully improved the research skills of geography educators; this underlines the obstacles, in utilizing digital tools effectively in this context. In my opinion as a researcher I think this inadequacy in proficiency is influenced by factors such, as the inadequate design of these programs the lack of hands on training and the failure to incorporate contemporary technologies into educational curricula. The connection, between how skilled teachers with using technology and how well their students perform is not a theory, it is backed up by previous studies that highlight the significance of integrating digital tools into education practices. Research by Muammar et al. (2023) suggests that teachers need specific training to enhance their ability to utilize resources effectively. If teachers only receive training without hands on practice it becomes challenging for them to apply these skills in classroom settings. The results are consistent, with the research conducted by Al Shamrani (2019) which validated that educators who receive assistance in utilizing technology are more adept at incorporating these resources into their teaching methods. This assistance could involve attending workshops engaging in initiatives and being part of communities. All of which play a role, in improving teachers technological competence.

The limited involvement, in platforms and use of digital tools may also stem from a lack of understanding on how to actively participate in these online spaces. Many prior research works (Alali & Al-Barakat, 2023; AlAli & Aboud, 2024; Al Ghamdi, 2017; Al Zahrani & Ali, 2018) indicate that engaging with digital communities can greatly improve teachers skills in utilizing technology and promote the sharing of insights and thoughts. To sum up the discussion, on how to improve geography teachers' digital research skills effectively requires a strategy that focuses on hands on training and continuous assistance. By revamping development initiatives to include these aspects educators can enhance their readiness in using resources efficiently resultantly boosting their skills and enhancing students' academic achievements.

3. Discussion of the Results of Domain Three

The results of the study, on geography teachers digital design abilities indicate a deficiency in skills proficiency as shown by a low average rating that underscores the minimal effectiveness of existing training initiatives for educators in this field. This result can be linked to factors. Predominantly arises from the absence of hands on practical training, in these programs which results in teachers feeling ill equipped to utilize the acquired skills effectively within their teaching environments. Moreover the way the educational material is structured in programs might not fully tackle the difficulties teachers encounter which could restrict how beneficial the training is. Various research studies (Al Barakat et al., 2023; Al Hassan et al., 2022; Fraihat et al., 2022; Khasawneh et al., 2022) have shown that professional development initiatives focusing on learning have led to enhancements, in teachers' tech skills. For instance studies by Al Shamrani (2019) and Baysan & Cetin (2021) highlighted that incorporating hands on projects into training programs improved teachers' abilities emphasizing the pressing need for strategies, in programs. The focus, on learning is also reflected in the research findings concerning the challenge of creating assessment tools that align with the requirements of online education. A notable aspect highlighted by studies (Al Hassan et al., 2012; Khasawneh et al., 2023) indicates that educators frequently face difficulties due to a lack of expertise and materials to develop these tools underscoring the importance of assistance, in this domain.

Furthermore the decrease, in ratings for aspects pertaining to creating blogs and educational videos shows reluctance among educators to incorporate these resources even though they have the ability to improve student engagement. Al Ghamdis study from 2021 shows that teachers who underwent instruction on these resources were better equipped to include them in their teaching methods leading to a boost, in student involvement. It is clear from these findings that professional development programs need to be all-encompassing. They should contain hands-on training, focusing on what teachers really need help with. The key is to use methods that boost design skills and ensure teachers have the tools they need to continue growing. By improving the design of professional development programs, we can help teachers use technology more successfully, which will benefit students and help achieve learning goals.

4. Discussion of the results of domain four

The findings, from the category reveal a lack of digital management expertise among geography educators underscoring the pressing demand for enhanced professional development initiatives in this field. According to the authors' recommendations the majority of teachers are deficient in the skills needed to handle digital resources, which can be largely ascribed to inadequate opportunities, for hands on instruction. Research conducted by Çam & Koç (2024) demonstrates that practical training boosts teachers' capacity to integrate technology into instruction positively impacting the educational

experience. Henceforth the lack of hands on experience, in existing programs might be a factor contributing to the identified deficiencies, in skills. In addition, to that discovery about how educators handle games and project oriented learning techniques suggests that teachers are not fully taking advantage of these tools as they could be doing based on research, by various scholars (Al-Barakat & Al-Hassan, 2009; Al-Halalat et al., 2024; Chung et al., 2020; Denieffe, 2020; Méndez et al., 2022; Montero Mesa et al., 2023; Taimalu & Luik, 2019; Tondeur et al., 2017).

These studies indicate that integrating games can notably enhance student involvement and stimulate thinking. The lack of incorporating these approaches in education highlights the necessity, for providing teachers with training, on effectively utilizing these digital tools. Moreover the findings suggest that educators face challenges, in utilizing information to enhance outcomes. This is consistent, with research (Birgin et al., 2020; Buonsenso et al., 2021; Campbell et al., 2020; Çam & Koç, 2024; Detyna & Kadiri, 2019; Denieffe, 2020; Méndez et al., 2022; Montero Mesa et al., 2023) that underscores the significance of analyzing data to make informed choices.

Quality development initiatives should strive to improve educators' skills in this realm since proficient data analysis plays a role, in advancing the learning process. Additionally the findings indicate a shortage of efforts to create spaces by forming online learning communities. A research conducted by Al Hassanet et al. (2024) indicate that virtual educational communities promote teamwork and engagement, among educators and learners resulting in achievements. The lack of communities underscores the importance of enhancing teachers' interpersonal and communication abilities which're crucial for establishing more successful learning settings.

CONCLUSIONS

The research findings indicate that although teachers have skills in utilizing technologies effectively; there are notable deficiencies, in advanced digital competencies, like overseeing educational systems and analyzing data accurately. These gaps imply that existing teacher training programs may not fully cater to their requirements and call for a thorough review to align with the evolving landscape of education. Teachers often lack the skills, in design and tool management due to insufficient practical training provided to them. This absence of support and involvement hinders their capacity to seamlessly incorporate technology in classrooms resulting in an impact, on both teaching quality and students' learning encounters.

In order to tackle these challenges effectively and adapt to the changing landscape of education today in a manner a significant transformation of professional development initiatives is crucial. These programs should prioritize the acquisition of skills that align with educational standards. By integrating learning experiences and practical training sessions educators can better translate their knowledge into real world scenarios. It is imperative that these programs offer content to empower teachers with the resources needed to cater to students' needs and enhance the overall quality of education. To improve these programs further and make them more inclusive and engaging for teachers and trainers alike is essential. It's vital to focus on maintaining communication channels and providing support while also promoting active involvement, in digital learning communities to boost teachers' tech skills.

The research group analyzed 223 geography supervisors and curriculum coordinators, from Northern Jordan in the study; however, this might restrict how broadly the results can be applied to fields as well. The answers provided could be affected by the supervisors' interactions with teachers, which could result in views, on challenges related to professional growth.

In studies it would be beneficial to involve educators from fields to gain a more comprehensive insight into the effectiveness of training programs, for professionals Teaching supervisors and teachers can shed light on how supervisor support influences teachers' digital competencies Investigating new teaching approaches like project based learning, through experimental studies may boost teacher productivity and student involvement

Finally; to better understand the impact of economic obstacles, in utilizing technology for education purposes and to develop impactful solutions, for these challenges requires thorough evaluations first and foremost.

Limitations and Future Research Directions

This study was limited to a sample of 223 supervisors and coordinators of geography curriculum from northern Jordan, which may affect the generalizability of the results to other regions. The sample may not fully represent the challenges faced by teachers in other areas of Jordan. Therefore, future studies should increase the sample to contain varied regions in order to ensure broader representation of the trends and challenges related to enhancing digital skills. Furthermore, the study primarily relied on a questionnaire as the data collection instrument, which may not provide a comprehensive understanding of the complex challenges teachers encounter. To address this, future research could integrate a variety of instruments, such as classroom observations and semi-structured interviews, to collect more detailed and well-rounded data.

Regarding future research directions, it is crucial to broaden the scope of studies to include diverse learning environments and regions, as this would offer deeper insights into the challenges teachers face. Furthermore, exploring the influence of supervisory support on the development of teachers' digital skills is crucial. Research should also assess the effectiveness of innovative teaching methods, such as project-based learning, which may enhance teacher-student interaction. Finally, it is important to examine the economic barriers to adopting educational technology and develop dynamic solvongs to meet these challenges, ensuring the sustainable digital transformation of learning environments.

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DVARAVATI HERITAGE TOURISM: EXAMINING THE INTERPLAY BETWEEN DESTINATION IMAGE, MEMORABLE TOURISM EXPERIENCES, AND TOURIST REVISIT INTENTIONS

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Abstract: The growing role of tourism in economic development has significantly influenced global land use, creating complex challenges in balancing urban growth, resource utilization, and environmental conservation. Destinations now face increasing pressure to preserve natural landscapes and cultural heritage while accommodating a rising number of tourists. A destination's long-term success depends on visitor satisfaction and their intention to return. In the context of Dvaravati cultural tourism, existing research has mainly emphasized general development, with limited focus on how contemporary visitors interact with heritage sites—revealing a gap in understanding tourist engagement with these ancient locales. Understanding how visitors emotionally and experientially connect with heritage sites is essential for developing sustainable cultural tourism strategies. This study aims to address these gaps by examining the relationship between the destination image of Dvaravati cultural heritage sites, memorable tourism experiences, and revisit intention. It investigates how key elements—such as the characteristics of Dvaravati heritage and seasonal cultural activities—shape visitor perceptions and influence behavioral intentions. Data were collected from 303 participants and analyzed using structural equation modeling. The study confirms the structural validity of destination image and memorable tourism experience constructs. Destination image is composed of natural attractions, cultural attractions, and tourism facilities, while memorable experiences are defined by factors such as novelty, happiness, and involvement. Results reveal a strong positive effect of destination image on memorable tourism experiences, emphasizing the importance of integrating cultural, historical, and environmental elements to enhance visitor satisfaction and support place-based cultural revival efforts. The study contributes to experiential tourism theory by demonstrating that destination image indirectly influences revisit intention through memorable tourism experiences. These experiences, rooted in cultural engagement and emotional connection, are key drivers of tourist behavior. For practitioners, the findings underscore the importance of prioritizing immersive, culturally rich experiences over promotional strategies. By incorporating community-based activities, educational components, and meaningful tourist-local interactions, destinations can significantly enhance visitor satisfaction and foster repeat visitation.

Keywords: Dvaravati, cultural heritage, destination image, memorable tourist experience, revisit intention

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INTRODUCTION

Tourism's growing role in economic development (Chau, 2024) has shifted global land use patterns, affecting the balance between environmental conservation, resource production (Arif et al., 2023), and human settlement (Turdimambetov et al., 2024). This presents intricate challenges of balancing the competing interests of safeguarding natural environments, preserving historic landmarks, and accommodating an increasing number of tourists confronting nations (Chong & Balasingam, 2019; Wang et al., 2024). Tourists' satisfaction and revisit intention are essential components for the success of any destination (Nguyen Huu et al., 2024). Numerous prior studies have identified various antecedents of the factors associated with the overarching concept of destination image, mainly focusing on destination attractiveness (Braimah et al., 2024; Karim et al., 2024).

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The Dvaravati cultural heritage, which emerged and became prevalent in the Gulf of Thailand from the 6th to 11th centuries AD (Carter, 2023), is a unique artistic tradition that combines Indian influences with indigenous Southeast Asian elements. This is evident in the archaeological sites and artifacts found throughout the region (Waiyasusri et al., 2024). In Thailand, Nakhon Pathom province is a significant ancient center within this cultural landscape, exhibiting the rich artistic and architectural traditions of the Dvaravati, featuring landmarks such as Phra Pathom Chedi Racha Worawihan Temple, along with other historic temples, including Phra Ngam Temple, Don Yai Hom Temple, and Dhamma Sala Temple. These are significant tourist spots frequented by visitors. Despite the rich cultural heritage of Dvaravati sites, particularly their unique artistic and architectural elements, there remains a considerable research gap regarding visitor experiences and attraction management. While previous studies have documented the historical significance and cultural value of these sites (Carter, 2023; Waiyasusri et al., 2024), limited attention has been paid to understanding contemporary tourist experiences and their motivation to revisit these historical attractions.

Although research highlighted the cultural tourism potential of the region, it primarily focused on broad cultural development rather than specific visitor engagement with Dvaravati heritage sites (Cheudchim et al., 2014). Furthermore, while the physical preservation of these historical sites has been addressed (Yuenthon et al., 2023), there is insufficient research on how tourists interact with and interpret these ancient cultural spaces in the modern context; much more can be done on leveraging the unique Dvaravati artistic style and cultural elements to enhance visitor experiences, for instance. This study aims to address existing research gaps by examining the effect of the destination image of Dvaravati cultural heritage sites on visitor experiences and revisit intention.

It investigates how key elements—such as the characteristics of Dvaravati heritage and seasonal cultural activities—shape visitor perceptions and influence their behavioral intentions.

LITERATURE REVIEW

Destination image in cultural heritage tourism

Destination's image, in the context of cultural heritage sites, is characterized by a rich blend of tangible (architecture, artefacts) and intangible (cultural practices, spiritual significance) cultural elements (Wang et al., 2024). Religious and cultural sites possess unique characteristics that contribute to their overall image formation (Jose et al., 2024) collectively shaping their tourism appeal. Destination image encompasses the aggregate of beliefs, ideas, and impressions tourists hold regarding a destination (Sun et al., 2021). It refers to 'the core tourism product image associated with tourist attractions and tourism facilities that directly address tourists' fundamental needs' (Zhang et al., 2016), and a subjective interpretation of a location that exists in a tourist's mind, influencing their behavior across three stages: priori, loco, and posteriori (Afshardoost & Eshaghi, 2020; Agapito et al., 2013). Thus, it is a significant construct that affects tourists' decision-making, destination selection, post-trip evaluations, and subsequent behaviors (Zhang et al., 2018). Various types of destinations exist, including cities, countryside, regions, and countries, and attracted considerable attention, particularly for their substantial influence on tourists' decision-making and sustainable behavior, leading to their examination in numerous studies within tourism and hospitality literature (Lam et al., 2024).

Memorable tourism experience

Tourism experience is a complex notion that includes an individual's subjective assessment and comprehension of events associated with their travel activities across all phases of the journey—before, during, and after the trip (Tung & Ritchie, 2011). Kang & Gretzel (2012) conceptualize it as a continuous flow of thoughts and feelings that emerge through complex psychological, sociological, and cognitive interactions as visitors engage with various destination elements, from service providers to physical surroundings, during moments of consciousness. Travel and tourist activities fundamentally stem from these encounters, considered exceptional and distinct from everyday life experiences (Cohen, 1979). In the context of religious heritage sites, the cultural tourism experience includes spiritual, educational, and cultural dimensions. Recent research highlights the multidimensional nature of cultural tourism experiences, which incorporate authenticity, emotional connection, and cultural learning (Kim & Ritchie, 2014).

Additionally, the experience level has evolved from passive observation to active participation in cultural activities (Pine & Gilmore, 2013). Given that tourist experiences form the core of tourism and hospitality, competition is growing, necessitating destinations to offer memorable tourism experiences (MTEs). MTEs, defined as a selectively constructed and recalled tourism experience based on individual assessment (Kim et al., 2012), reinforce pleasurable memories of the destination (Ritchie & Ritchie, 1998). This has piqued the interest of researchers and practitioners to examine what drive the competitiveness of such destinations (Gelbman, 2021).

Academics have proposed dimensional frameworks for measuring the experience quality of MTEs that serve as the most reliable indicators of future behavior and establish a novel benchmark (Chandralal et al., 2015; Kim et al., 2012; Neuhofer et al., 2014). The measurement of MTEs includes the components of hedonism, refreshment, local culture, meaningfulness, knowledge, engagement, and novelty which have been applied in several studies (Kim et al., 2012; Sthapit & Coudounaris, 2018; Tsai, 2016). Prior research has demonstrated that destination image plays a crucial role in shaping tourists' experience quality, satisfaction, and behavioral intentions, particularly regarding revisit intention (Chen & Tsai, 2007; Lee et al., 2005). The influence of destination image on visitors' satisfaction (experiences) was examined by Lu et al. (2015), who supported for the relationship. The study of Afshardoost & Eshaghi (2020) found a significantly positive correlation between the cognitive image of the destination and the intention to visit. In addition, previous studies also show that destination attractiveness impacts tourist revisits (Cong et al., 2020; Cong, 2016). Tourists who

perceive and value natural beauty and unique cultural experiences show a desire to return to the destination (Nguyen Viet et al., 2020). Therefore, the hypotheses are proposed as follows:

H1: Destination image directly affects memorable tourism experience

H2: Destination image directly affects revisit intention

Revisit intention

Revisit intention is the behavior intention that represents a form of post-consumption behavior (Cole & Scott, 2004) that emerged as a significant area of inquiry within tourism literature (Li et al., 2018). This behavior intention refers to a tourist's desire to return to a destination following their engagement in activities during a prior visit and is characterized as a visitor's repetition of an activity or return to a destination (Baker & Crompton, 2000). The satisfaction and experiences from previous visits to a destination fundamentally shape the revisit intention of tourists (Huseynli & Huseynli, 2024; Li et al., 2021; Teng, 2021). This behavioral pattern manifests in two key ways: through tourists' direct assessment of their likelihood to return to the same destination and their willingness to recommend the destination to others (Khasawneh & Alfandi, 2019). The relationship between experience and revisit intention operates cyclically: Tourists who have experienced satisfaction and positive encounters during their visits are more inclined to return to the same destination, while those who have encountered negative experiences form lasting unfavorable memories that discourage future visits (Seow et al., 2024). This dynamic highlight how past experiences serve as a critical determinant in tourists' decision-making process regarding future visits, ultimately influencing both their personal travel choices and their role in word-of-mouth promotion of the destination. In the study of Zhou et al. (2023), destination image and memorable tourism experiences positively correlated with tourists' revisiting intention. Tsai (2016) investigated the impact of second-order measurement of MTEs and identified its significance on behavioral intention. Studies also indicate that destination image influences tourist behavior both directly and indirectly, mediated by factors including perceived value, experience quality, and satisfaction (Lu et al., 2015). Therefore, this research hypotheses are developed as follows:

H3: Memorable tourism experience directly affects revisit intention

H4: Destination image indirectly affects revisit intention through the memorable tourism experience

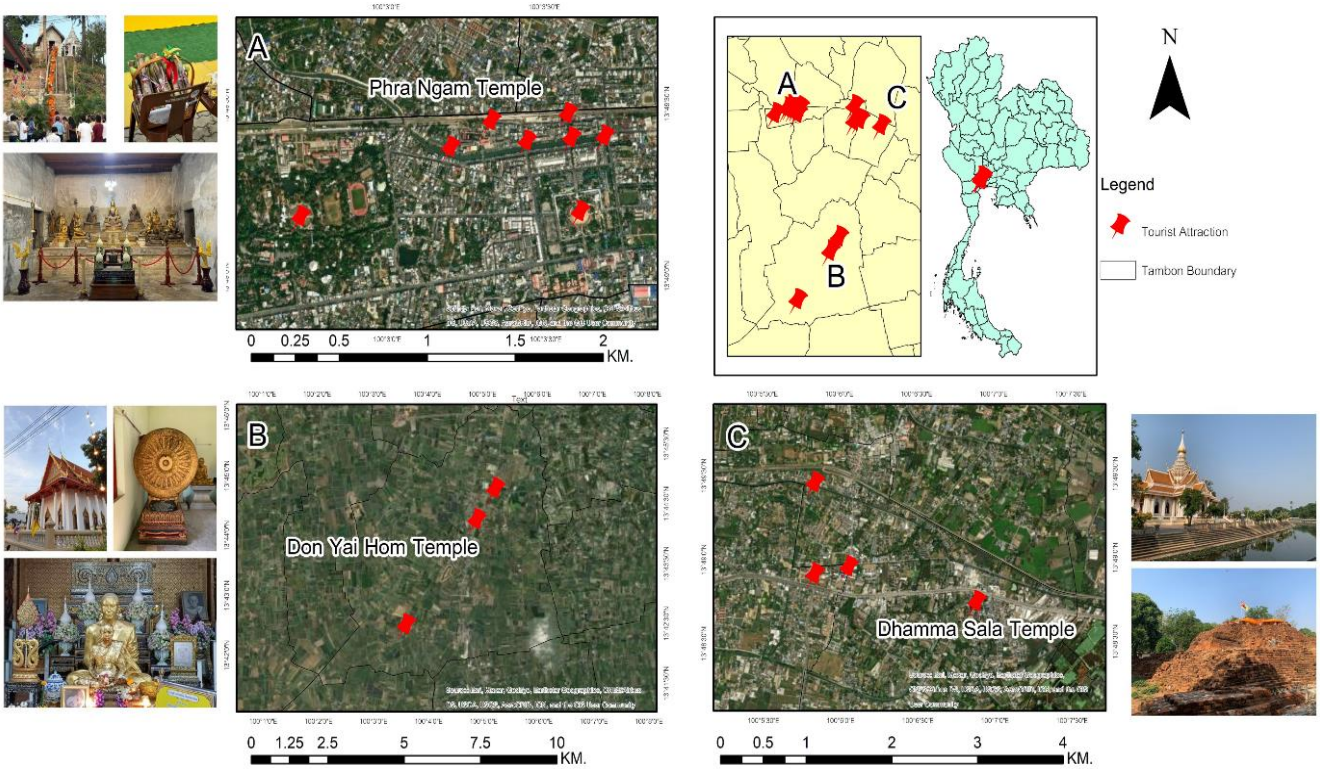


Figure 1. Spatial distribution map of Dvaravati heritage tourism attractions in the study area
(A) Phra Ngam Temple, showing the revival of historical alms-giving tradition (left top), the sticky rice in bamboo (right top), and the ancient Buddha image enshrined in the historic Maha-ut Ubosot, a heritage ordination hall (bottom); (B) Don Yai Hom Temple, featuring the Luang Pho Ngoen Shrine (left top), the Dvaravati-period stone Dhammachakra pillar (right top), and Luang Pho Ngoen Images (bottom); (C) Dhamma Sala Temple, showing the Ordination Hall (top) and Wat Thammasala Archaeological Site (bottom); Satellite imagery: Google Earth Pro, 2024; Base maps: Thailand Administrative Boundary, Royal Thai Survey Department, 2023; Field survey photographs: Researchers' documentation; Tourist attraction locations: Global Navigation Satellite System (GNSS) data from field survey collection; Photo insertion in GIS figure: December 15, 2024

RESEARCH METHODOLOGY

The study area

The Dvaravati cultural capital in Nakhon Pathom Province consists of two primary categories: community-based

Dvaravati heritage and cultural wisdom, each illustrating historical lifestyles, beliefs, and ancient knowledge. This cultural capital possesses intrinsic and economic value, evident in its application in Buddhist ceremonies and historical tourism. It promotes community pride and collective preservation efforts that enhance local cultural connections and heritage transmission (Pinkaew et al., 2024). This study was conducted in the context of the cultural heritage presented at Phra Ngam Temple, Don Yai Hom Temple, and Dhamma Sala in Nakhon Pathom Province, Thailand, as illustrated in Figure 1. The art of Dvaravati still exists through architecture, art, and some activities such as the revival tradition from historical events (sticky rice in bamboo alms-giving tradition).

Measurement development and questionnaire design

This study assessed three constructs: destination image, memorable tourist experience, and revisit intention. Destination images are regarded as second-order reflective constructs reflecting qualities at the first level. The items of destination image constructs were modified from Zhang et al. (2016), which encompasses the fundamental components of a destination product, including attractions and infrastructure. The items were derived from the literature encompassing natural landscape, cultural landscape, accommodation, catering, retail, and tourist activities (Zhang et al., 2018; Zhang et al., 2016).

Memorable tourist experiences are characterized as a second-order reflective construct comprising first-level reflective dimensions. The evaluation of tourist experiences uses a 24-item scale derived from the seven elements adopted from memorable tourist experiences (MTEs): hedonism, refreshment, local culture, meaningfulness, knowledge, engagement, and novelty (Kim et al., 2012; Tsai, 2016). Revisit intention is assessed by three items (Horng et al., 2012; Zhang et al., 2016).

The questionnaire comprises five sections: an introduction to the study, measuring items for constructs, and demographic information. The introduction offered a concise summary of the study, the anticipated duration for participation, and guarantees concerning the confidentiality of personal data preservation.

The initial component comprised construct assessments for destination image, whereas the latter section contained items assessing perceptions of tourist experience, and revisit intention. All items utilizing a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The final component collected respondents' demographic data, including age, gender, education, occupation, frequency and duration of visit, and purpose of travel.

Data collection

The Ethics Review Committee authorized the questionnaire before beginning data collection. Data was collected between April and June 2024, from participants in three temples related to the Dvaravati cultural heritage in Nakhon Pathom Province, Thailand: Phra Ngam Temple, Don Yai Hom Temple, and Dhamma Sala Temple. The simple random sampling technique was employed. The questionnaires were administered as self-administered surveys, which are more cost-effective and require less administrative time (Sudman et al., 1965). A response rate of 59.667% was achieved, as 358 questionnaires were obtained out of the 600 that were initially distributed. 303 completed questionnaires were retained for statistical analysis after incomplete data was excluded.

Sample size

Researchers suggest multiple criteria for establishing suitable sample sizes in studies. Hoe (2008) indicates that a sample size exceeding 200 participants is typically adequate for robust data analysis. Wolf et al. (2013) advocate for a ratio of 10 participants per predictor variable to ensure the reliability of prediction models. Based on these guidelines, the 303 samples in this study are deemed appropriate for subsequent analysis utilizing the structural equation modeling (SEM) approach.

Analysis method

This study employed a quantitative approach to investigate three primary aspects: the effect of destination image on the Dvaravati cultural tourist experience and the influence of their experience on revisit intention. This deductive approach encompassed gathering of numerical data, performing statistical analyses, and evaluating hypotheses. The data analysis was conducted utilizing the Mplus 7.3 program, adhering to the two-step approach outlined by Anderson and Gerbing (1988). A confirmatory factor analysis (CFA) was initially performed to evaluate the reliability and validity of the measurement variables. After testing the measurement model, structural equation modeling (SEM) utilizing a maximum likelihood method was employed to analyze the relationships among the three constructs examined in this study.

RESULTS

Demographic profile of the respondents

As shown in Figure 2, of the total 303 respondents, 54.5% of participants identified as female, while 45.5% identified as male. The age distribution indicated that 42.9% of individuals were aged 31-40 years, 19.8% were 21-30 years, 18.2% were 41-50 years, 14.5% were 51-60 years, 3.3% were under 21 years, and 1.3% were over 60 years. Regarding educational attainment, 50.5% possessed bachelor's degrees, 47.2% held qualifications below the bachelor's level, and 2.3% achieved degrees beyond the bachelor's level. In terms of visit frequency, 36.3% of participants had visited more than five times, 24.4% had visited four to five times, 20.1% had visited two to three times, and 19.1% were first-time visitors. 52.8% of individuals spent 2-3 hours in the area, 33.3% spent half a day, 10.9% spent a full day, and 3.0% spent a single hour. The primary reasons for visits included merit-making, temple visits, and spiritual relaxation at 43.9%, followed by the pursuit of good fortune and auspiciousness at 18.5%, recreation and relationship building at 18.5%, local food tasting at 9.6%, photography/content creation at 6.3%, and learning about history and culture at 3.3%.

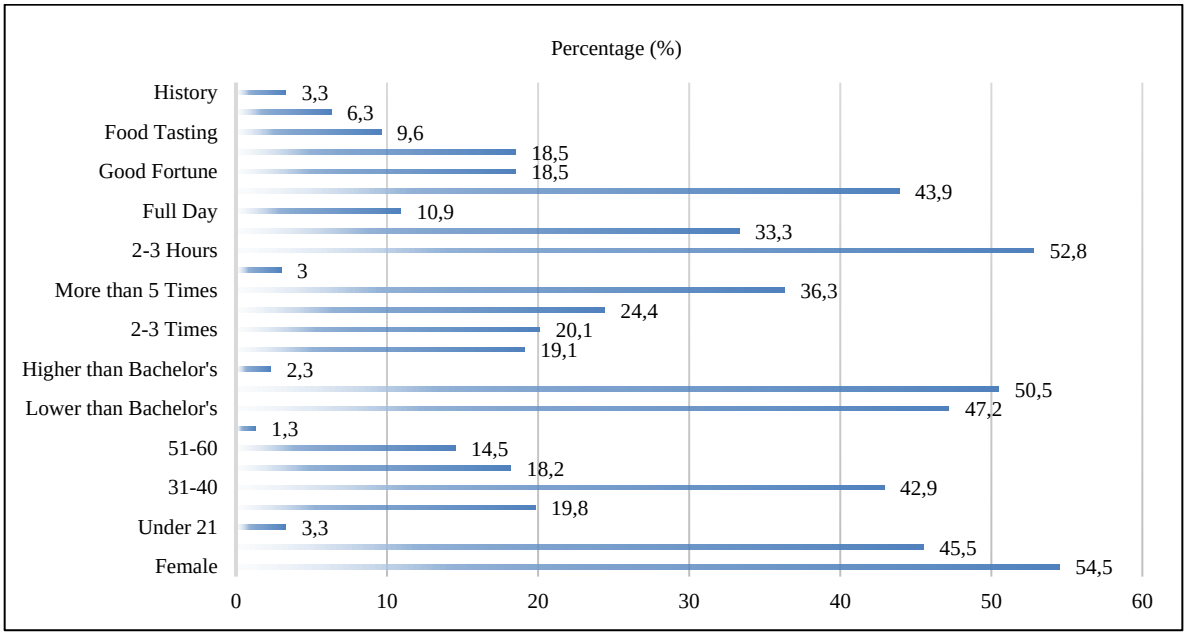


Figure 2. Demographic profile of the respondents

Confirmatory factor analysis (CFA)

CFA tests assumptions concerning whether model variable related patterns match empirical evidence. It ensures appropriate and accurate analysis results. The researchers assessed the goodness of fit between empirical data and relationship structures using five statistical criteria: criteria applicable to models between 12-30 items and more than 250 samples: chi-square (χ^2)/degrees of freedom (df) < 3, comparative fit index (CFI) > 0.920, Tucker-Lewis index (TLI) > 0.920, root mean square error of approximation (RMSEA) < 0.070, and standardized root mean square residual (SRMR) < 0.080 (Hair et al., 2010). The suggested cutoff value of 0.70 was utilized to assess internal consistency (a) and construct reliability (CR) (Fornell & Larcker, 1981). A benchmark value of 0.50 was employed to assess AVE (Bagozzi & Yi, 1988).

In this phase, items exhibiting low factor loadings that failed to meet the established criteria were removed, as they were deemed inappropriate for the study's context. Table 1 shows the validity and reliability of measures analyzed through CFA. The destination image variable comprises three components: natural attractions, cultural attractions, and tourism facilities, totaling 8 observed variables. MTEs comprises 7 components: happiness, novelty, local culture, refreshment, meaningfulness, involvement, and knowledge, totaling 18 observed variables. Meanwhile, the revisit intention has 3 observed variables, bringing the total to 29 observed variables in this research model.

The goodness-of-fit indices showed Chi-square = 528.637, df = 320, CFI = 0.942, TLI = 0.927, RMSEA = 0.046, and SRMR = 0.046. Reliability analysis showed Cronbach's alpha values for first-order latent variables ranging from 0.667 to 0.904. Although the natural attractions latent variable had a Cronbach's alpha of 0.667, values between 0.60 and 0.70 may be acceptable in contexts not requiring high precision, such as human behavior or social science research (Shi et al., 2012). Composite reliability (CR) values ranged from 0.672 to 0.903, surpassing the acceptable threshold of 0.600 (Hair et al., 2010), which indicates good internal consistency. Average Variance Extracted (AVE) values exceeded 0.500. This indicates that each latent variable accurately accounts for the variation in its corresponding observed variables.

Table 1. Confirmatory factor analysis (n = 303)

First-order latent variables Observed Variables	**Factor Loadings**	**t-value**	**CR**	**AVE**
Natural Attractions (α = 0.667, KMO = 0.500)			0.672	0.506
Beautiful natural resources.	0.749	15.122**		
Beautiful landscape	0.672	13.567**		
Cultural Attractions (α = 0.740, KMO = 0.637)			0.748	0.501
Unique traditions and way of life.	0.824	22.888**		
Abundant historical and cultural heritage.	0.651	15.436**		
Unique historical culture.	0.632	14.596**		
Tourism Facilities (α = 0.744, KMO = 0.593)			0.777	0.553
Tourism facilities in the area (toilets, parking, signage).	0.920	25.335**		
Area facilities are consistent with local resources and environment.	0.757	20.470**		
Tasty and diverse local restaurants.	0.490	10.042**		
Happiness (α = 0.764, KMO = 0.594)			0.788	0.562
I really enjoyed and had fun with this tourism experience.	0.923	28.935**		
I was excited to experience new things from this trip.	0.681	18.309**		
This trip was exciting and made me want to discover new things.	0.610	14.425**		

First-order latent variables Observed Variables	**Factor Loadings**	**t-value**	**CR**	**AVE**
Novelty (α = 0.701, KMO = 0.500)			0.709	0.550
This trip was different from previous travel experiences.	0.783	16.490**		
I experienced something new from this trip.	0.698	14.668**		
Local Culture (α = 0.812, KMO = 0.500)			0.843	0.729
I experienced Dvaravati culture closely.	0.881	34.859**		
Local people are friendly.	0.826	30.017**		
Refreshment (α = 0.759, KMO = 0.637)			0.756	0.513
This trip made me feel refreshed.	0.827	22.328**		
This trip gave me restoration.	0.721	18.024**		
This trip let me enjoy a sense of freedom.	0.579	12.506**		
Meaningfulness (α = 0.755, KMO = 0.651)			0.759	0.515
I did something important on this trip.	0.837	22.062**		
This trip helped me learn about myself.	0.667	15.648**		
I did something meaningful on this trip.	0.633	14.390**		
Involvement (α = 0.745, KMO = 0.500)			0.737	0.584
I really enjoyed the activities I wanted to do.	0.797	13.896**		
I was interested in many activities on this trip.	0.730	13.081**		
Knowledge (α = 0.744, KMO = 0.675)			0.862	0.674
Gained knowledge about tourism and Dvaravati.	0.830	32.410**		
Learned new cultural aspects about Dvaravati tourism.	0.828	27.800**		
Explored new things about Dvaravati tourist attractions.	0.806	26.256**		
Revisit Intention (α = 0.904, KMO = 0.747)			0.903	0.757
I think I will revisit here in the future.	0.904	51.397**		
I want to come back here again.	0.880	46.638**		
I am likely to come back here again.	0.824	36.541**		
Model Fit indices: χ^2 = 528.637 (p = 0.000), df = 320, CFI = 0.942, TLI = 0.927, RMSEA = 0.046, SRMR = 0.046				

Notes: χ2 = chi-squared, df = degree of freedom, CFI = comparative fit index, TLI = Tucker-Lewis index, SRMR = standardized root mean square residual, RMSEA = root mean square error of approximation, Loadings* = standardized factor loadings, t-value is significant at **p<0.001, α = Cronbach alpha reliability, CR = Composite reliability, AVE = Average variance extracted

Two main methodologies assessed the discriminant validity of the measurement model in Table 2. The Fornell and Larcker (1981) criterion involved comparing the square root of AVE, which ranged from 0.707 to 0.870, for each construct against its respective correlation coefficients. All diagonal values exceeded their respective correlation coefficients (Rönkkö & Cho, 2022). In the second part, the CICFA method applied a cutoff value of 0.900 for problem classification. The upper bound coefficients (97.5%) remained below this threshold, with values ranging from 0.011 to 0.852. The absence of discriminant validity issues in the strongest correlations across latent variables indicates that each construct in the model is distinct from the others. This strengthens the measurement model's framework and makes it appropriate for hypothesis testing using structural equation modeling analysis.

Table 2. Discriminant validity analysis

	NA	**CA**	**TF**	**HD**	**NV**	**LC**	**RF**	**MF**	**IV**	**KL**	**RI**
NA	**0.711**	0.631	0.402	0.411	0.499	-0.057	0.429	0.292	0.346	0.016	0.195
CA	[.510,.752]	**0.707**	0.360	0.290	0.439	-0.117	0.426	0.371	0.263	-0.122	0.115
TF	[.268,.536]	[.236,.483]	**0.744**	0.259	0.306	0.057	0.343	0.206	0.232	0.034	0.126
HD	[.282,.541]	[.160,.419]	[.131,.387]	**0.750**	0.534	0.166	0.194	0.238	0.311	0.149	0.285
NV	[.358,.640]	[.303,.575]	[.160,.452]	[.415,.653]	**0.742**	0.121	0.377	0.248	0.343	0.211	0.193
LC	[-.207,.094]	[-.254,.019]	[-.073,.188]	[.037,.295]	[-.022,.264]	**0.854**	0.110	0.200	0.328	0.789	0.331
RF	[.287,.571]	[.301,.552]	[.219,.467]	[.062,.326]	[.240,.515]	[-.027,.247]	**0.716**	0.488	0.288	0.149	0.106
MF	[.139,.446]	[.239,.502]	[.071,.340]	[.106,.371]	[.098,.398]	[.066,.335]	[.364,.611]	**0.718**	0.270	0.228	0.104
IV	[.198,.495]	[.121,.406]	[.094,.370]	[.177,.445]	[.200,.485]	[.194,.461]	[.148,.428]	[.128, .412]	**0.764**	0.345	0.178
KL	[-.129,.161]	[-.256,.011]	[-.093,.161]	[.023,.275]	[.075,.346]	[.727,.852]	[.017,.281]	[.100,.356]	[.219,.471]	**0.821**	0.208
RI	[.055,.335]	[-.018,.248]	[-.001,.252]	[.166,.405]	[.056,.329]	[.215,.447]	[-.027,.238]	[-.028,.236]	[.043,.312]	[.088,.327]	**0.870**

Note: The bold numbers in parentheses on the diagonal are the square roots of AVE. The upper right triangle elements are the correlation values between the latent constructs. The lower left triangle elements are correlation values of latent constructs at 2.5% lower/ upper bound. NA = Natural Attractions, CA = Cultural Attractions, TF = Tourism Facilities, HD = Happiness, NV = Novelty, LC = Local Culture, RF = Refreshment, MF = Meaningfulness, IV = Involvement, KL = Knowledge, RI = Revisit Intention

Second-order confirmatory factor analysis

This statistical technique confirms whether a main hypothesized structure is effectively measured by its sub-components, which are, in turn, measured by questionnaire items. Model fit is evaluated using statistics like chi-square, SRMR, RMSEA, and CFI. As shown in Table 3, the second-order CFA results revealed good model fit for both destination image (χ^2 = 41.874, df = 17, CFI = 0.964, TLI = 0.941, RMSEA = 0.069, SRMR = 0.040) and memorable tourism experience (χ^2 = 231.410, df = 126, CFI = 0.949, TLI = 0.938, RMSEA = 0.053, SRMR = 0.059). The destination image

comprised three first-order factors (natural attractions, cultural attractions, and tourism facilities), while the memorable tourism experience included seven factors (happiness, novelty, local culture, refreshment, meaningfulness, involvement, and knowledge). All first-order latent variables showed significant Cronbach's alpha coefficients ($p<0.001$), confirming them as valid components of their respective second-order structures.

Table 3. Second-order confirmatory factor analysis

Second-order construct	First-order construct	Factor Loadings	t-value
Destination image	Natural attractions	0.823	9.191**
	Cultural attractions	0.746	9.032**
	Tourism facilities	0.468	6.860**
Model Fit indices: χ^2 = 41.874 (p = 0.000), df = 17, CFI = 0.964, TLI = 0.941, RMSEA = 0.069, SRMR = 0.040			
Memorable tourism experience	Happiness	0.567	7.643**
	Novelty	0.709	9.702**
	Local culture	0.284	3.729**
	Refreshment	0.520	6.924**
	Meaningfulness	0.492	6.176**
	Involvement	0.541	7.317**
	Knowledge	0.341	4.609**
Model Fit indices: χ^2 = 231.410 (p = 0.000), df = 126, CFI = 0.949, TLI = 0.938, RMSEA = 0.053, SRMR = 0.059			

Note: t-value is significant at **p<0.001)

Structural model

This study developed a structural model to confirm the relationships between variables. It showed acceptable fit indices ($\chi 2$ = 489.179, df = 330, CFI = 0.956, TLI = 0.946, RMSEA = 0.040, SRMR = 0.079). The results shown in Table 4 revealed that destination image affect memorable tourism experience (H1: $\beta = 0.738$, $p < 0.001$), and the experience of the Dvaravati tourism also effect on revisit intention (H3: $\beta = 0.402$, $p < 0.010$). Destination image had no direct affect revisit intention (H2: $\beta = -0.085$, $p > 0.05$) but showed a significant indirect effect through memorable tourism experience (H4: $\beta = 0.297$, $p < 0.050$). The Sobel test ($z = 2.708$, $p = 0.006$) confirmed the mediating role of memorable tourism experience between destination image and revisit intention.

Table 4. The structural model hypothesis conclusion

Hypotheses	β	t-values	Confidence Interval (97.5% CI)	Results
H1: DI ⟶ MTE	0.738	11.186***	[0.609, 0.868]	Accepted
H2: DI ⟶ RI	-0.085	-0.573	[-0.375, 0.205]	Rejected
H3: MTE ⟶ RI	0.402	2.797**	[0.120, 0.684]	Accepted
H4: DI ⟶ MTE ⟶ RI	0.297	2.579*	[0.071, 0.523]	Accepted

Note: β = Path coefficient, *** = p < 0.001, ** = p < 0.01, * = p < 0.05, the confidence intervals are the values of the standardized coefficient at 2.5% lower/upper bound. DI = destination image, MTE = Memorable tourism experience, RI = revisit intention

DISCUSSION

The study's results support the components behind the constructs of both the destination's image and the memorable tourism experience. For the destination image, the second-order construct was validated through three first-order factors: natural attractions, cultural attractions, and tourism facilities. All three factors exhibited significant factor loadings (natural attractions = 0.823, cultural attractions = 0.746, tourism facilities = 0.468; $p < 0.001$), demonstrating their strong contributions to the overall construct. Seven first-order factors were used to accurately describe the memorable tourism experience: happiness (0.567; $p < 0.001$), novelty (0.709; $p < 0.001$), local culture (0.284; $p < 0.001$), refreshment (0.520; $p < 0.001$), meaningfulness (0.492; $p < 0.001$), involvement (0.541; $p < 0.001$), and knowledge (0.341; $p < 0.001$). Each factor demonstrated significant factor loadings, confirming their importance in shaping the overall tourism experience.

This study's findings also underscore the important influence of cultural dynamics on the Dvaravati historical tourism experience. The significant effect of destination image on memorable tourism experience ($\beta = 0.738$, $p < 0.001$) highlights the necessity of an integrated approach that includes natural landscapes, historical heritage, distinctive cultural traditions, and adequate amenities (e.g., restaurants, parking facilities).

These factors work together to make the visitor experience better, which is in line with what Chen & Tsai (2007) and Lu et al. (2015) found, which showed how important geographical and contextual factors are in cultural heritage tourism. This study contributes to the discussion on place-based cultural revival programs by demonstrating that the integration of cultural practices with historical and natural environments can improve visitor experiences.

The findings demonstrate that memorable tourism experience significantly influences tourists' intentions to revisit ($\beta = 0.402$, $p < 0.010$). This supports the claims made by Tung & Ritchie (2011) and Cohen (1979), who contend that tourists' engagement in unique and culturally enriching experiences fosters positive memories, serving as significant motivators for revisits. The reinforcement of these memories enhances emotional attachment to the destination, as noted by Li et al. (2021) and Teng (2021). While the destination image does not directly affect revisit intention ($\beta = -0.085$, $p > 0.05$), its indirect effect via memorable tourism experience is significant ($\beta = 0.297$, $p < 0.050$). An appealing destination image provides a basis for developing distinctive experiences; however, it alone does not ensure repeat

visits. This finding, within the framework of Dvaravati tourism, corresponds with Seow et al. (2024), who highlight that the quality of experiences—especially those that are unique, rare, and memorable—promotes intentions to revisit.

CONCLUSION

Theoretical Contribution

These findings have several theoretical implications for destination image and tourism experience literature. First, the lack of correlation between destination image and revisit intention indicates a more intricate mechanism. Although the direct effect is insignificant, the indirect effect through MTEs of Dvaravati highlights the importance of memorable experiences in influencing tourism behavior. Tourists find happiness and novelty in discovering ancient archaeological sites and engage with local culture through culture and religious ceremonies. They also feel refreshed by unique historical experiences, connection with local wisdom, participation in community-based activities, and learning about cultural heritage. These experiences are memorable because they allow tourists to participate in and deeply understand local communities' deep-rooted traditions and pride while experiencing something different from their daily lives.

This shows that the destination influences behavioral intentions through experiential rather than cognitive processes. These findings support and extend experiential tourism theory, proposing that location qualities must be transformed into memorable experiences to understand tourist behavior and loyalty formation.

Managerial implications

There are several significant managerial implications for tourism stakeholders and professionals who manage destinations. As opposed to concentrating merely on advertising the characteristics of the destination, management should make the creation of immersive experiences a top priority. This can be accomplished by implementing carefully crafted experiential programs that actively involve tourists in ancient sites, religious rites, and community activities. The enhancement of tourist experiences should encompass all seven dimensions of memorable tourism experiences. This can be accomplished by 1) creating joyful discovery moments, 2) ensuring exceptional experiences, 3) facilitating meaningful interactions with locals, 4) providing spaces for restoration, 5) enabling self-discovery, 6) offering a variety of opportunities for engagement, and 7) developing comprehensive educational components about the heritage of Dvaravati.

Tourism management organizations and local governments should continually take steps to create and improve cultural events that foster interactions between foreign tourists and the culture of the host country (Nguyen Huu et al., 2024). Additionally, developing partnerships with local communities is vital for creating authentic cultural experiences. The genuine encounters with community members greatly contribute to creating experiences that leave lasting impressions in visitors' memories; thus, it could boost their intention to revisit the Dvaravati tourism destination.

Future Research Directions

While this study uses quantitative approaches to provide valuable insights into the links between destination image, MTEs, and revisit intention in the Dvaravati tourism area, Future research may benefit in two key ways. First, researchers could use a mixed-methods approach to better understand tourists' experiences and motivations at Dvaravati cultural sites. Furthermore, the quantitative approach could enhance studies on many groups of visitors based on their distinct demographic profiles, as these destination factors may have varying effects on perceptions across these groups. A qualitative technique could be used to investigate the attitudes, readiness, and engagement levels of the local community in the area. Second, future studies could broaden the geographical scope by conducting comparative research at various Dvaravati cultural heritage sites in Thailand, identifying regional differences in tourist perceptions and experiences while providing more comprehensive implications for cultural tourism development in the larger Dvaravati context.

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PROSPECTS FOR THE DEVELOPMENT OF GEOTOURISM IN THE ATYRAU REGION OF THE REPUBLIC OF KAZAKHSTAN

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Abstract: Paleontology, being one of the branches of geology, is a scientific discipline that helps to understand the evolution of life on Earth. The dissemination of information about paleontology is currently based on fossil finds and descriptions of their locations. The purpose of this work was to identify potential sites for geological tourism and summarize data based on the results of field research conducted in the Atyrau region of the Republic of Kazakhstan. The article considers the possibility of developing paleontological tourism in the Atyrau region of the Republic of Kazakhstan. Significant paleontological sites such as the Koykara and Imankara Mountains, the Akkegershin Cretaceous plateau and the Sholkara upland are located in the Zhylyoy district of Atyrau region. Special attention should be paid to the Sholkara upland, located 130 km south-east of the city of Kulsary, where unique paleofauna specimens were found. The main locations of natural fossil sites (Koykara, Imankara Mountains, Akkegershin Cretaceous plateau, Sholkara) are described, and the species and genus of the found samples of invertebrates and vertebrates are determined. In 1931, the paleontologist A. Ryabinin discovered the vertebrae of a Cretaceous dinosaur in the Koykara massif, which was described as *Embasaurus minax*, which underlines the historical significance of the region for paleontological research. Various fossils have been found in these areas, including teeth and vertebrae of Otodus sharks, fragments of belemnites (*Belemnitella mucronata*), bivalves (*Gryphea dilatata*), sea urchins (*Echinocorys*), as well as single scleractinia corals (*Caryophyllum similotrochus*). Atyrau region has significant potential for the development of geological and paleontological tourism. There are resources for organizing guided tours and educational programs, including: the Paleontological Museum in Atyrau, which includes hundreds of authentic exhibits found in the region, such as teeth of prehistoric sharks, fossils of megalodons, plesiosaurs and mollusks. In general, Atyrau region has the prospect of developing geological tourism of an excursion and educational nature. For this purpose, the region has a large number of resources and various local history and environmental museums containing paleontological materials.

Keywords: Atyrau region, paleontology, geology, fossils, Cretaceous plateau, sediments, ichthyosaurus, dinosaur, mollusks, geotourism

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INTRODUCTION

According to Braholli & Menkshi (2021), modern geological and geomorphological objects are inanimate objects that can enhance curiosity and expand knowledge about the history of the Earth through the development of geotourism. As notes Comanescu & Dobre (2009), the process of inventory and assessment of a geomorphological object (such as scientific value, environmental, aesthetic, cultural and economic values) will lead to the development of a number of provisions for the excellent protection and promotion of tourism, including the proposal of geotourism routes. As notes Reynard (2005), Reynard & Panizza (2005), Reynard et al. (2016), geological objects are parts of the geosphere that are of particular importance for understanding the history of the Earth, geological and geomorphological objects that have acquired scientific, cultural-historical, aesthetic and/or socio-economic value due to human perception or research, as part of geodiversity.

Geotourism is a type of natural tourism that pays special attention to the landscape and geology, the preservation of cultural heritage and traditions, the study of history, geography, the popularity of the unique nature of the territory, and attracting investment (Sergeyeva et al., 2022). Paleontological tourism is a type of scientific tourism, or ecotourism, associated with geotourism (Gaworecki, 2003). Tourist destinations in paleontological tourism include parks, trails, routes and excavation sites, all of which become a factor in both the economic and social development of territories associated with the opening of museums and the preservation of scientifically valuable objects and specimens (Schwanke & Silva, 2004).

According to Antczak (2020), the fossils of dinosaurs and other quadrupeds are of interest to humans. Each find of a new (especially large) species receives coverage in national and international media, and thus local finds serve as the basis for the development of local tourism. An integral part of paleontological tourism is visiting the sites of fossil and places of their storage and study, i.e. local history and environmental museums. Visiting parks and exhibitions of fossil reconstructions is also an integral part of paleotourism (Yakupova et al., 2024). Among the local museums where the finds of fossils are kept, the paleontological branch of the Museum of History and Local Lore of Atyrau region can be

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distinguished. Currently, the museum's collection contains about 8 thousand storage units. A unique part of the collection is the paleontological collection. There are fossil sponges, corals, mollusks, bivalves, ammonites, belemnites, sea lilies, sea urchins. The museum also displays teeth of sharks, rays, fossilized vertebrae of *Plesiosaurus*, *Ichthyosaurus*. All of them are found on the Cretaceous plateaus of the Atyrau region. The range of tourist resources in Atyrau region is quite extensive to attract tourists to travel. Of particular interest are the natural locations of the Atyrau region, such as the mountain uplifts of Koykara, Imankara, the Cretaceous plateau Akkegershin and Sholkara (Figure 1).



Figure 1. Geographical location of the described geological objects: 1 - Cretaceous plateau of Akkegershin; 2 - Koykara Mountains; 3 - Imankara Mountains; 4 – Sholkara Mountains (Source: https://www.nationsonline.org/oneworld/map)

The purpose of this work is to study potential locations for the development geological tourism and summarize data based on the results of field research conducted in the Atyrau region of the Republic of Kazakhstan.

MATERIALS AND METHODS

The objects of the study were the natural locations of the Atyrau region and the fossils found on their territory in August, 2024. In preparing the article, we used field research materials (August, 2024), statistical, reference, stock and literary materials on the natural conditions and resources of the Atyrau region. Descriptive, comparative geomorphological research methods were used to characterize the territory (Tikhonovich, 1915; Ryabinin, 1931; Chigarkin, 2006; Akhmedenov et al., 2022), methods of their systematic and structural analysis, current information and empirical base on geology. The method of collecting and processing paleontological and stratigraphic material was carried out according to the method of Krymgolts (1954). The species and genera of the finds were determined (Mirkamalov, 1966; Ivakhnenko & Korabelnikov, 1987; Bodylevsky, 1990; Miller et al., 2022). All samples are stored in the paleontological branch of the Museum of Local Lore of Atyrau region.

RESULTS DISCUSSIONS

Imankara Mountain Uplift

We have studied the Imankara object (Figure 2), which is located in the Zhylyoy district. The district was established in 1928 under the name Zhilokosinsky district. In 1963, it was renamed the Embinsky district. The current name since October 7, 1993 (Kaiyrzhanova et al., 2023). Photo of Imankara Mountain uplift was taken in Zhylyoy district, Atyrau region by Yakupova in August, 2024. The territory of the district is 29.4 thousand km^2. The area is located on the northeastern coast of the Caspian Sea. The terrain of the territory is flat. The western part of the district is occupied by the Caspian lowland, the eastern plateau is Ustyurt. In the northern part there are salt marshes, in the southern part there are Karakum sands. Absolute heights range from 26 to 221 m; the highest point is Mount Zheltau. The Emba River flows through the territory of the Zhylyoy district. The soils are gray-earth and saline, clay surfaces are also common (Akhmedenov et al., 2022).



Figure 2. Imankara Mountain uplift, Atyrau region, Republic of Kazakhstan**,** 2024 (Source: Authors)

Geologically, the territory of the Zhylyoysky district is divided into two parts: the eastern part, composed of outcrops of Cretaceous deposits and the western part, represented by a complex of Paleocene-Oligocene deposits of marine and Aeolian origin (Chigarkin, 2006). The general direction of the mountain is meridional. To the south, it decreases and the strata composing it go under the thickness of the chalk, which further forms the vast Akkegershyn plateau. Mount Imankara has many features in common with Mount Koykara both in terms of orographic outlines and tectonic structure. It is also a brachyanticline, broken off in the arch by a large discharge (Kaiyrzhanova et al., 2023).

Jurassic deposits on the territory are represented by clay sands with nodules of dense sandstone, clays with bright yellow ferruginous crusts, sandstones with aggregations of siderite, limonite and plant residues. Cretaceous deposits are represented by greenish-gray loose sandstones with Lower Albian fauna: *Cuculaeaglabra Parkinson; Cerithium aff. Wundstorfi 'Wollm.; Naticagaultianad'Orb.; Leeymeriella tardefurcata* Leym. Cenomanian sediments are represented by lemon-yellow sandy clays with interlayers of gray clays and fauna of *Caryophyllum similotrochus* (Kaiyrzhanova et al., 2023). The Cretaceous deposits are composed of sands, Cretaceous clays and marls. Remains of invertebrate fossil fauna have been found, such as cephalopods *Belemnitella mucronata*, bivalves *Gryphea dilatata*, the shell of the sea urchin *Echinocorys* sp., single corals-scleractinium *Caryophyllum similotrochus* (Kaiyrzhanova et al., 2023).

Fossils found from Cretaceous deposits of the Imankara mountain uplift are shown in Figure 3-6.

Echinocorys is an extinct genus of sea urchins that lived from the Late Cretaceous Period to the Paleocene. The genus belongs to the family *Holasteridae*. His remains have been found in Asia, Europe, Australia and North America. Representatives of the genus *Echinocorys* form one of the most widespread groups of irregular sea urchins in the rocks of the Upper Cretaceous and Paleocene (Figure 3). *Belemnitella mucronata* (Schlotheim) (Figure 4).

Upper Cretaceous, Campanian. When viewed from the abdominal side, the rostrum has a cylindrical shape. The top of the rostra ends in a long spike. The alveolus occupies more than half the length of the rostrum; its apex is close to the abdominal side. The abdominal fissure is short (less than half the depth of the alveoli).



Figure 3 Fossil sea urchin *Echinocorys sp*., Atyrau region, Imankara, 2024 (Source: Authors)



Figure 4. *Belemnitella mucronata* (from the dorsal side) Atyrau region, Imankara, 2024 (Source: Authors)

Ostrea inflata (Trautschold) (Figure 5). Lower Cretaceous, lower Valanginian (rarely middle Valanginian). The shell is rounded-triangular, steeply truncated on the high front side and slightly depressed under the tops. Both valves are strongly and almost equally swollen (Bodylevsky, 1990). *Exogyra flabellata*, Cenomanian-Turonian (Figure 6). Both

valves are radially folded. The ligamentous platform is of the exogyroid type. On the lower valve under the platform, there is a groove for the tooth-shaped protrusion of the upper valve.

The inner edges of both valves are serrated. The muscular imprint of a pear-shaped, or triangular-oval shape, is located in the central part of the valve or slightly shifted to the posterior edge (Mirkamalov, 1964).



Figure 5. *Ostrea inflata* (Trautschold)
Atyrau region, Imankara, 2024 (Source: Authors)



Figure 6. Shellfish *Exogyra flabellate*
Atyrau region, Imankara, 2024 (Source: Authors)

The Cretaceous plateau of Akkegershin

The Akkegershin Cretaceous plateau is located 240 km from the city of Atyrau and 48.8 km from the city of Kulsary in the Atyrau region. The distance from the Beineu-Dossor highway to the Akkegershin Cretaceous plateau is 41 km (Akhmedenov et al., 2022). The chalk mountains of Akkegershin stretch from the southeast to the northwest for 11.6 km. The width of the plateau in some areas reaches 7.5 km. Here, the chalk cliffs resemble the ruins of an ancient city (Figure 7).



Figure 7. The Cretaceous plateau of Akkegershin, Atyrau region, Republic of Kazakhstan**,** 2024 (Source: Authors)



Figure 8. Single coral – *Scleractinium, Caryophyllum Similotrochus* Atyrau region, Akkegershin, 2024 (Source: Authors)



Figure 9. *Belemnitella lanceolata* Schloth.
Atyrau region, Akkegershin, 2024, (Source: Authors)

Akkergeshin looks like castles built in a row. The plateau is called Akkegershin. There are several opinions about why it is called that way. According to one of them, the name comes from "ak kögershin" (white dove). According to another version, the word consists of three parts – "ak" (white), "kergu" (to soar upward) and "shyn" (peak) (Akhmedenov et al., 2022).

In August 2024, bivalves, solitary corals and belemnites have been found in the Cretaceous plateau of Akkegershin.

The single coral Caryophyllum similotrochus (Figure 8) is descended of the Upper Cretaceous. A large polyp lives on a ribbed convex or concave stand, which has been preserved in a fossil state (Ivakhnenko & Korabelnikov, 1987). *Belemnitella lanceolata* Schloth. (Figure 9) is descended of Maastricht, Upper Cretaceous. Fusiform in shape, with a shallower alveolus (about 1/3 of the length of the rostrum) (Bodylevsky, 1990).

The Mountains of Sholkara

The Sholkara Mountains (Figure 10), poorly preserved remnants of the Ustyurt plateau, are located 114 kilometers southeast of the district center – Kulsary, 105 kilometers east and slightly north of the Karakum sands, 20.4 kilometers northwest of the Zheltau mountains, 79 kilometers northeast of the village of Borankul in the in the Zhylyosky district in the southeast of the Atyrau region. The dominant unnamed mark is located in the northern part of the upland and is 121.9 meters above sea level, in the central part of the mountains a mark with a height of 120.3 meters above sea level dominates. The mountains are located at the junction of Atyrau, Aktobe and Mangystau regions, where part of the Atyrau region has an elongated appendicitis from southeast to northwest. The territory of the mountains is one of the most inaccessible, least studied, the nearest settlement is 79 kilometers in the southwest - the village of Borankul (formerly Oporny).



Figure 10. The Mountains of Sholkara, Atyrau region, Republic of Kazakhstan**,** 2024 (Source: Authors)

The relief of the mountains is distinguished by areas of flat surfaces and residual plateaus, the western part of the mountains is the steepest and most sheer, the eastern part is smoothed. The Sholkara Mountains are rich in paleontological finds - oyster shells, teeth of Paleogene sharks, vertebrae of bony fish that lived in the Tethys Ocean about 40 million years ago.



Figure 11. Bivalve mollusk Venericardia (Pacificor) Hornii Calafia Stewart, 1930 Atyrau region, Sholkara, 2024 (Source: Authors)



Figure 12. Vertebra of a marine reptile remain, Mesozoic Atyrau region, Sholkara, 2024 (Source: Authors)

These fossils were found at the foot of Mountains of Sholkara in Atyrau region in August 2024 by the authors. Currently, the samples are stored in the paleontological branch of the Museum of Local History of the Atyrau region of the Republic of Kazakhstan. The bivalve mollusk *Venericardia (Pacificor)* Hornii Calafia Stewart, 1930 is descended of

Middle Eocene (Lutetian) (Figure 11); the vertebra of a marine reptile is descended of Mesozoic, Cretaceous (Figure 12); rounded fragments of Jurassic belemnites (Figure 13) were found from the mountainside. These fossils were found at the foot of Mountains of Sholkara in Atyrau region in August 2024 by the authors. Currently, the samples are stored in the paleontological branch of the Museum of Local History of the Atyrau region of the Republic of Kazakhstan. The following samples were also found here in August 2024: vertebrae of fossil fish (Figure 14), teeth of fossil sharks, *Striatolamia macrota* (Figure 15), *Turania* (Figure 16), *Otodus* (Figure 17), which are descended of Cenozoic, Paleogene (41-38 million years), bivalve mollusk *Ostrea mosquensis* is descended of Upper Jurassic (Figure 18). Currently, the samples are stored in the paleontological branch of the Museum of Local History of the Atyrau region of the Republic of Kazakhstan.



Figure 13. Belemnite fragments,
Atyrau region, Sholkara, 2024 (Source: Authors)

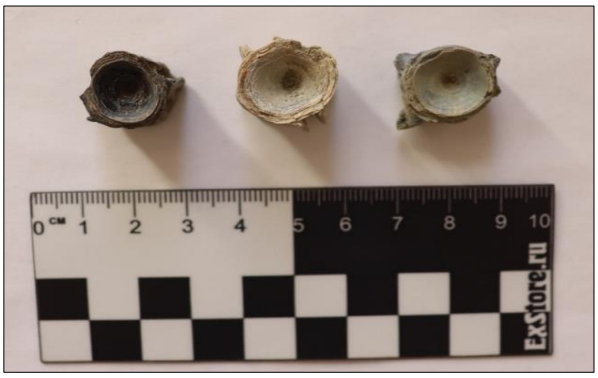


Figure 14. Vertebrae of a fossil fish
Atyrau region, Sholkara, 2024 (Source: Authors)



Figure 15. The tooth of a fossil shark *Striatolamia Macrota* Atyrau region, Sholkara, 2024 (Source: Authors)



Figure 16. The tooth of a fossil shark *Turania*
Atyrau region, Sholkara, 2024 (Source: Authors)



Figure 17. The tooth of a fossil shark *Otodus*
Atyrau region, Sholkara, 2024 (Source: Authors)



Figure 18. Bivalve mollusk *Ostrea mosquensis*
Atyrau region, Sholkara, 2024 (Buch) (Source: Authors)

Koykara Mountain Uplift

The Koykara uplifts (Figure 19) were examined in detail by geologist Tikhonovich (1915) at the beginning of the XX century. According to this researcher, Mount Koykara, 103 meters above sea level, is "an elevation consisting of several isoclinal beds, each corresponding to the outcrop of successively higher sediment horizons, starting from the Middle Jurassic. Since the dislocation in the northern half of the mountain was more intense, this part of it is more elevated. The eastern slope coincides with the dip of the Cenomanian strata lying on the top of the mountain and very gently descends into the above-mentioned trough. The photo (Figure 19) was taken at the foot of Koykara mountain in Atyrau region in August 2024 by the authors. Currently, the samples are stored in the paleontological branch of the Museum of Local History of the Atyrau region of the Republic of Kazakhstan.



Figure 19. Koykara mountain uplift, Atyrau region, Republic of Kazakhstan, 2024 (Source: Authors)



Figure 20. Bivalve mollusk *Ostrea mosquensis* (Buch) Atyrau region, Koykara, 2024 (Source: Authors)

The tectonic form of Mount Koykara is a brachyanticline, slightly elongated in the meridional direction and most intensely curved at the northern end, and gradually plunging at the southern end. Due to this, the lowest horizons of deposits developed in this area, clays, coal-bearing shales and sandstones of the Jurassic age, come to the surface here. The opposite slope, which forms the gentle foot of Mount Koykara, is strewn with many large sandstone concretions. Here we found numerous bivalve mollusks *Ostrea mosquensis* (Buch) (Figure 20). Upper Jurassic, lower and middle substages of the Volgian stage. The shell is oblique, unequal-valve and unequal-sided. The left valve is convex, with a protruding and strongly curved umbonal part. The right valve is almost flat, steeply descending to the rear edge; its front part protrudes forward.

It is of interest that Ryabinin in 1931 described vertebrae from the Koykara uplifts, belonging to the anterior part of the dorsal vertebrae of theropod dinosaurs of the Early Cretaceous period, which is known as *Embasaurus*, which means "Emba lizard" (Ryabinin, 1931). Since it is known only from fragmentary remains, some consider *Embasaurus* to be a possible nomen dubium. It was named after the Emba River and is thought to have lived during the Berriasian stage, about 140 million years ago. Olshevsky believes that *Embasaurus* to be a megalosaurid, closely related to *Magnosaurus*, *Megalosaurus*, and *Torvosaurus* (Olshevsky, 1991). Due to the fragmentary nature of the remains, the question of its classification has been raised: it could be a *Megalosaurus*, close to *Torvosaurus* or *Megalosaurus*, or it could be a basal *Tyrannosaurus*. Figure 21 shows a reconstruction of *Embasaurus* made by the Kazakh designer I. Iskhakov and a reconstruction made by foreign specialists (Figure 22) (Weishampel et al., 2004).

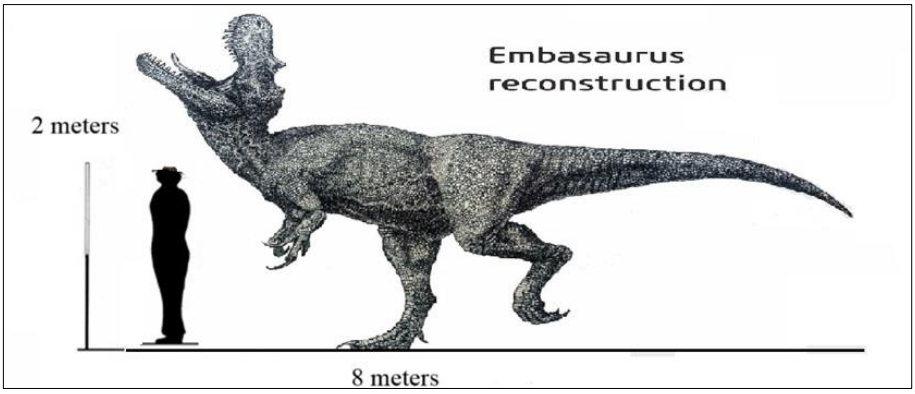


Figure 21. One of the reconstructions of *Embasaurus minax*, Riabinin, 1931 (variant 1)

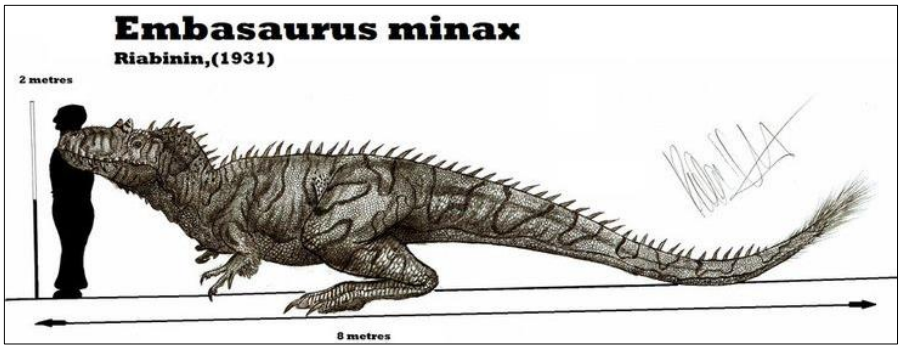


Figure 22. One of the reconstructions of *Embasaurus minax*, Riabinin, 1931 (variant 2) (Weishampel, 2004)

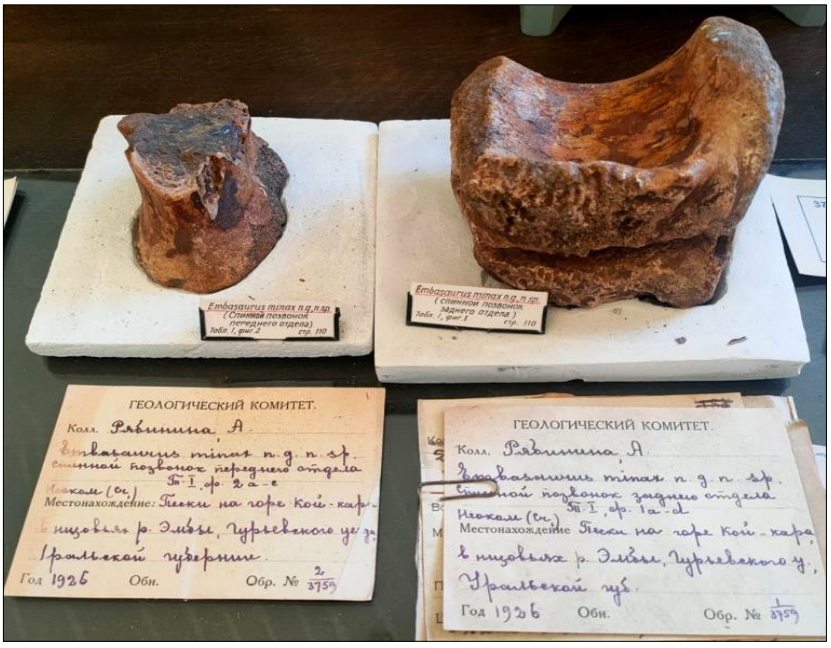


Figure 23. *Embosaurus* Vertebrae, A. P. Karpinsky Geological Research Institute, 2024 (Source: Authors)

Currently, the dorsal vertebra (large) and the vertebra from the anterior section of the dorsal vertebrae of Embasaurus are stored in the A. P. Karpinsky Russian Geological Research Institute (Figure 23), St. Petersburg, Russia (noted by one of the authors Akhmedenov during the excursion, August, 2024). Unfortunately, we did not find any dinosaur fossils during the expedition. We believe that *Embasaurus* can be considered a paleontological highlight of the Atyrau Museum and that this unique find for world science should be reflected in the future exhibition.

Photo of the *Embasaurus* vertebrae was taken by Akhmedenov in August, 2024.

CONCLUSION

In this paper, potential locations for geological tourism are identified and data on the results of field studies conducted in the Atyrau region of the Republic of Kazakhstan are summarized. The main locations of the natural sites of fossils (Koykara, Imankara mountains, Akkegershin Cretaceous plateau, and Sholkara) are described, the species and generic affiliations of the found samples of invertebrates and vertebrates are determined. Fossil-bearing sites are considered natural cultural monuments and should be considered as territories of great practical importance for scientists and local communities. These sites offer unique information about the geological and biological history of the region.

According to Sergeyeva et al. (2022), the popularity of the Cretaceous plateaus as an object of mass tourism will increase in proportion to the dissemination of information. Over time, this will make it possible to create the infrastructure and necessary modern services. The development of the tourism industry, which is of crucial importance for the region, should take into account the geological structure of the territory and the presence of a large number of interesting and unique objects of geological heritage that provide opportunities for organizing geotourism.

Thus, the territory of the Atyrau region of the Republic of Kazakhstan has the opportunity to develop geological (paleontological) tourism of an excursion and educational nature. For this purpose, the region has a large number of necessary resources and there is a paleontological museum containing paleontological specimens.

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EATING GREEN, STAYING SAFE: HOW MASLOW'S NEEDS SHAPE CONSUMER INTENTIONS TOWARD GREEN RESTAURANTS IN TÜRKIYE

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Abstract: Needs are an abstract concept that exists in human life and serves as the fundamental motivation for many decisions. These needs include emotional, psychological, abstract, and concrete choices that influence human behavior. This study aims to examine the moderating role of Maslow's hierarchy of needs, specifically focusing on the impact of safety needs on consumer behavior. The research explores the relationship between consumer attitudes toward eco-conscious dining venues and their purchase intentions. A questionnaire-based approach was employed to collect data from green restaurant consumers in Türkiye. The target population consists of individuals who frequently dine in environmentally friendly restaurants. Structural equation modeling analysis was conducted on data collected from 450 participants. The analysis was performed using the Smart PLS 4 program to test the proposed relationships. Results indicate that the independent variable, Attitude Toward Green Restaurants, has a positive and significant effect on the dependent variable, Consumption Intention. The study further investigates Maslow's theory of human motivation and its role in consumer decision-making. Among the various dimensions of Maslow's hierarchy, only the need for safety/security demonstrated a moderating effect. This finding suggests that safety concerns play an intervening role in consumer decisions related to green dining. Consumers are more likely to dine at eco-conscious restaurants when they feel secure. The results emphasize the importance of safety considerations in shaping purchase behavior. Businesses should address these concerns to enhance customer trust and engagement. Understanding these factors can help marketers develop better strategies for promoting sustainable dining. By acknowledging the moderating role of safety needs, businesses can improve customer retention. The study contributes to the existing literature on sustainable consumption and consumer psychology. It also highlights the significance of integrating psychological needs into marketing strategies. Future research could explore other dimensions of Maslow's hierarchy in similar contexts. The findings offer valuable insights for restaurant managers and policymakers. Addressing safety concerns could lead to higher consumer engagement and loyalty.

Keywords: green practices, Maslow's theory of human motivation, Green Restaurants, green consumption intention

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INTRODUCTION

Globally, the excessive rate of population growth, urbanization and industrialization, as well as the production and consumption required environmental scientists and politicians to take measures and raise awareness on environmental protection. A recent example in this context is the 2022 Intergovernmental Panel on Climate Change (McKinnon et al., 2015, cited in Keşkekci & Gençer, 2023). The report prepared with the participation of 67 countries and 270 scientists under the title of "Climate Change 2022: Impacts, Adaptation and Vulnerabilities" presented important results. United Nations Secretary Antonio Gueterrs stated that "A well and rapidly managed transition to renewable resources is the only path to energy security, universal access to energy and the green jobs our world needs (IPCC, 2022)." He also emphasized the importance of green practices especially in today's world and for future generations (Keşkekci & Gençer, 2023). With the increasing awareness of individuals towards the natural environment and the increasing importance of the concept of sustainability at the social and political level, it prompts businesses to develop pro-environmental practices as a competitive factor (Yazıcıoğlu & Aydın, 2018; Alhemimah et al., 2024). In today's world, where environmental awareness is increasing day by day, consumers' purchasing behaviors can be associated with environmental problems (Wu et al., 2013).

Green restaurants are based on the implementation of environmentally conscious management (Maynard et al., 2021). It is expressed in literature as businesses that supply locally grown products from local producers and use them in their menus, have products prepared from products with organic certificates, recycling and waste or energy reduction programs, they want to gain competitive advantage, protect and increase brand image by building these sustainable structures, and making environmental regulations sustainable (İpar, 2018; Kim & Hall, 2020; Chen et al., 2010).

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For example, the “Green Restaurant Association”, which was established in 1990 in the USA, encourages restaurants to green management practices without any profit motive. Thus, many food and beverage businesses carry out more environmentally friendly activities in water, energy, waste, chemical material use, disposable tools and equipment and the general structure of the restaurant (Şahingöz & Güleç, 2019). Also, green consumption is one way to increase eco-friendly sustainability, while green consumers are aware of the deteriorating environment, exhibit a responsible attitude towards protecting the environment, and this thought influences their purchasing decisions (Chen & Hung, 2016; Atshan et al., 2024). Additionally, literature emphasizes the relationship between green consumption and human needs. People have more tendency on their security needs while consuming in eco-conscious dining venues as mentioned below. This study aims to explore the moderating role of Maslow's hierarchy of needs on the relationship between consumer attitudes towards eco-conscious dining venues and their purchase intentions. By focusing on green restaurant consumers in Türkiye, the research seeks to identify how different levels of human motivation, particularly safety needs, influence the translation of positive attitudes into actual consumption behaviors, thereby providing insights for sustainable practices in the food and beverage industry.

LITERATURE REVIEW

Maslow, who categorized and cascaded the needs of people in order of importance, for them to realize themselves, put eating and drinking on the first step as basic physiological needs and stated them as compulsory needs (Maslow, 1943; Maslow, 1954). Meeting the need for eating and drinking in the first step has turned to the step where people meet their various needs with gastronomic activities today (Karakan, 2021). In the history of the world, there have been periods in which the place and importance of nutrition has changed in the hierarchy of needs, and even more than one step. In the early ages, primitive people engaged in the act of eating only to fill their bellies. It is understood from the drawings on the cave walls that the people of that period went hunting to meet their nutritional needs and put their lives in danger. With the discovery of fire, food was cooked and thus the concept of "flavor" emerged. With this, the idea of the need for a kitchen began to emerge (Dilsiz, 2010). According to Sağdıç (2022), related to Maslow, individuals' food and beverage consumption motivations are considered under 5 factors. Accordingly, the first step is the basic step and deals with physiological needs. In the second step, people think about their future and store provisions, which constitutes their security step. In the third step, the act of eating becomes an element of social communication rather than a basic element, so that people experience a social relationship while consuming food and beverages. In the fourth step, people consume products classified as luxury foods to have respect and prestige. In the fifth and final step, the self-actualization step, people tend to experience more and tend to eat different, previously untried consumption products.

People's understanding of a subject plays a crucial role in their decision-making (Kaplan, 1991). Research by Blackwell et al. (2006), Laroche et al. (2001), and Loureiro (2003) indicates a connection between consumers' knowledge and their purchasing behavior. Specifically, Wu et al. (2013) found that knowledge about eco-conscious dining venues positively influences consumers' purchase intentions. Recent studies have explored how attitudes towards eco-conscious dining venues affect purchase intents. For example, Filho et al. (2017) aimed to assess how motivation for green consumption and environmental awareness impact the intention to choose green products and services. Their experimental study found that higher environmental awareness correlates with increased intention to consume green products, suggesting that informed consumers are more likely to act on their intentions. Riva et al. (2022) conducted a survey of 280 restaurant patrons, revealing that both green consumerism and perceived green value positively influence the intention to revisit. They also confirmed the moderating effect of perceived green quality, recommending that restaurant managers enhance customer perceptions of their environmental practices. Schubert et al. (2010) analyzed data from 455 restaurant customers, revealing a market opportunity for eco-conscious dining venues, as customers appreciate environmentally friendly practices and are willing to pay more for them. Zaremohzzabieh et al. (2021) used meta-analytic structural equation modeling to assess the integrated TPB-GPB framework, discovering stronger relationships between perceived environmental knowledge and green purchase intentions in non-Western countries, where cultural values emphasize collectivism. Also, it was discovered that employees' views on their restaurants' focus on environmental concerns serve as a psychological factor, connecting the restaurants' eco-friendly features to the employees' environmentally conscious actions (Joshua et al., 2022).

Oppositely, Mbokane & Modley (2024) investigated students' awareness and attitudes towards green consumerism at the University of Johannesburg, finding a significant relationship between income and field of study that affects awareness levels. They noted that purchasing decisions are more influenced by price and quality than environmental concerns. Dewald et al. (2013) examined U.S. consumers' definitions of "green" restaurants and their willingness to pay a premium for such experiences. They found that nearly 90% had dined at a green restaurant but struggled to define what that means like Nimri et al. (2021). They also found that 45% had dinner at a green restaurant and 37% found it hard to define. More than half indicated a willingness to pay extra, prioritizing fresh ingredients, health benefits, value, accessibility, and environmental considerations in their dining decisions (Dewald et al., 2013). Newell & Green (1997) highlight significant differences in environmental concern between African Americans and white Americans, noting that individuals with lower income and education levels tend to show varying degrees of concern. However, as income and education increase, the gap in environmental concern between the two groups diminishes significantly, which supports the findings in research by Aschemann-Witzel & Zielke (2015). Their findings suggest that organic food marketing, which is directly related to green products and green consumerism, should better distinguish between product categories and consumer segments. Consequently, different organic product lines should cater to consumers with varying income levels, family life stages, and regular versus occasional buying behaviors, while also tailoring communication about product benefits and pricing strategies to each specific category (Aschemann-Witzel & Zielke, 2015).

Shen (2017) surveyed consumers in Taiwan, establishing that perceptions of green restaurant attributes positively influence attitudes and intentions to dine there, with subjective norms and perceived behavioral control also playing significant roles. Moon (2021) aimed to uncover the belief structures influencing patronage of eco-conscious dining venues, finding that past behavior and demographic factors like gender and age are important predictors. Kwok et al. (2016) identified the most valued green attributes, showing that while consumers prioritize environmental factors, those who value food and management qualities are more likely to invest time and money into dining at green establishments. Teng et al. (2014) examined the relationships among consumer values, attitudes, and environmental concerns in Taiwan, concluding that personal values and attitudes significantly influence intentions to visit eco-conscious dining venues. Razib et al. (2023) found that environmental awareness mediates the relationship between attitudes toward green products and purchase intentions. In their study of green tourists' attitudes and behaviors, Leonidou et al. (2015) found that tourists' deontological beliefs, compliance with laws, and political engagement positively affect the development of an environmentally friendly mindset. This, in turn, promotes eco-friendly behaviors, leading to greater tourist satisfaction. Budak et al. (2023) highlighted the significant correlation between green product preference and trust, while Mai et al. (2023) showed that while organic materials enhance emotional attachment, they do not necessarily drive purchasing intentions.

Tawde & Shabbirhusain (2024) examine in their study how consumers' self-concepts affect their willingness to pay more (WTPM) for green products. According to data from an online survey of 313 Indian green consumers, both product self-concept and green self-concept influence WTPM through perceptions of green product virtue and green perceived value. Sarti et al. (2019) investigates that while health consciousness and perceived behavioral control positively influence attitudes toward buying organic products, knowledge about organics also plays a significant role in shaping purchase intentions. These results show how safety and security play a crucial role in sense of Maslow needs while consuming green products.

Overall, the literature indicates that positive attitudes towards green consumption and eco-conscious dining venues enhance purchase intents, with environmental awareness being a key motivating factor. This aligns with Maslow's hierarchy of needs, where environmental needs are considered a safety requirement (Frei, 2004). Safety needs include the desire for a healthy environment free from hazards. Thus, attitudes and intentions towards eco-conscious dining venues can be linked to Maslow's safety needs. Pimentel et al. (2024) also emphasized safety as the primary motivation within the realm of social-environmental responsibility, followed by physiological needs.

METHODOLOGY

As a result of the literature review on the research topic, the starting point of this research was to determine the impact of each need in Maslow's hierarchy of needs on eco-conscious dining venues and green purchase intent. Especially after the Covid 19 pandemic, individuals' health and safety needs are expected to come to the fore.

However, it has also been observed that popular culture has a significant impact on food consumption in general. This situation has shown that food consumption preferences have moved away from traditional culture and that society is in a cultural change. People have a desire to show off in the places they prefer both for their social status and for showing off (Bilen & Genceli, 2023). These results raise the question of whether people act in line with their security, social or prestige needs in their intention to prefer and consume eco-conscious dining venues. Based on the above statements, this study examines the role of Maslow's theory of human motivation in the effect of participants' attitudes towards eco-conscious dining venues on their intention to consume green products. In this context, the problem of the study is shaped within the framework of the main question "Do different steps of Maslow's theory of human motivation have an intervening factor in the effect of attitudes towards eco-conscious dining venues on purchase intent?" The research questions based on the research problem are shown below. These are:

1. Is there a relationship between attitude towards eco-conscious dining venues and purchase intent?

2. Does the attitude towards eco-conscious dining venues have an effect on purchase intent towards eco-conscious dining venues?

3. Does the perceived rank in Maslow's theory of human motivation have an intervening factor in the relationship between attitude towards eco-conscious dining venues and purchase intent?

In the study, a 15-minute online questionnaire-based approach, one of the data-driven study approaches, was applied to green restaurant consumers. The population of the study consists of green restaurant consumers living in Türkiye. However, the study, which has time and financial limitations, made it necessary to work on the sample. The sample selection in the study was based on a convenience sampling method, which is one of the non-probability-based sampling techniques. It is essential that everyone who responds to the questionnaire used in the convenience sampling method can be included in the sample (Altunışık et al., 2010). In this context, those who volunteered to answer the questionnaire from green restaurant consumers living in Türkiye between February 2024 and May 2024 were included in the convenience sampling. A total of 450 people responded to the survey. The study only deals with green restaurant consumers living in Türkiye. This situation reveals the limitation of the study. Structural equation modeling (SEM) approach was used to analyze the data. SEM is a multivariate technique that models the relationships between many dependent and independent variables and provides results by performing many analyses in a single process. SEM is a statistical technique generally used to explain multiple statistical relationships simultaneously through visualization and model validation (Aybek & Karakaş, 2023). Smart PLS 4, used in the research, features a completely revamped graphical user interface, faster processing speed for data prediction, and new model evaluation features (i.e., cross-validated predictive ability testing, endogeneity assessment, and necessary condition analysis), represents an important leap in development (Cheah et al., 2023). It was considered the most appropriate program for data analysis in this study, and it was applied.

Research model and hypotheses

The independent variable of the study is attitude towards eco-conscious dining venues, the dependent variable is purchasing intent, and the moderating variable is the sub-dimensions of Maslow's theory of human motivation. The conceptual model of the study is presented in Figure 1.

H1: Attitudes towards eco-conscious dining venues have a statistically significant effect on purchase intent.

H2: Perceived level in Maslow's theory of human motivation has an intervening factor in the effect of attitudes towards eco-conscious dining venues on purchase intent.

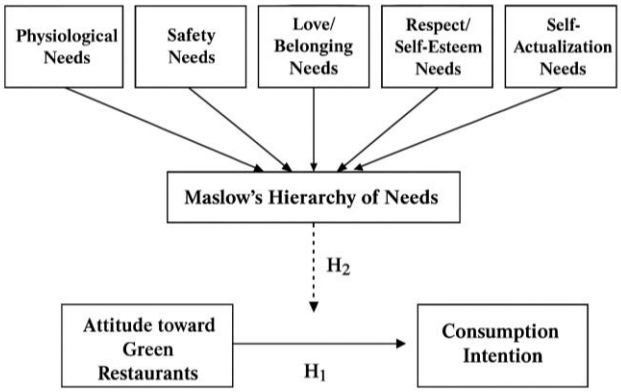


Figure 1. Research model

Data collection and measurement tools

The questionnaire applied as a 5-point Likert scale within the scope of the study consists of 4 parts and 43 questions. In the first part, it is aimed at reaching the demographic information of the participants. In the other sections, Physiological Needs, Security Needs, Love / Belonging Needs, Respect / Self-Esteem Needs, Self-Realization Needs, Attitudes Towards Green Restaurants and Consumption Intentions were included for the purpose of the study. Within the scope of the research, 3 scales with open access were utilized. A total of 32 questions about Maslow's hierarchy of needs were taken from the scale in the study "Maslow and the Motivation Hierarchy: Measuring Satisfaction of the Needs" published by Taormina & Gao (2013) and the scale "Understanding socio-economic inequalities in food choice behavior: can Maslow's pyramid help?" previously tested for validity and reliability by Van et al. (2015).

In the study published by Shen (2017) titled "Consumption Intentions toward eco-conscious dining venues: Application of theory of planned behavior and altruism", 6 questions were taken from the "Attitude towards eco-conscious dining venues" scale and 5 questions from the "Consumption Intention" scale. The questionnaire, which was developed using the scales, was translated into Turkish and underwent a pilot study in February 2024. During the pilot study, three academic experts in their respective fields provided recommendations to enhance the wording and clarity of the questions.

DATA ANALYSIS AND FINDINGS

Research findings on demographic characteristics

As shown in Figure 2, of the 450 participants, 49.8% were female and 52.8% were male. 45.8% of the participants were between the ages of 18-26 and 24.4% were between the ages of 27-35. Therefore, it can be said that approximately 70% of the participants are young consumers between the ages of 18-35. Single participants are in the majority with 68.8%.

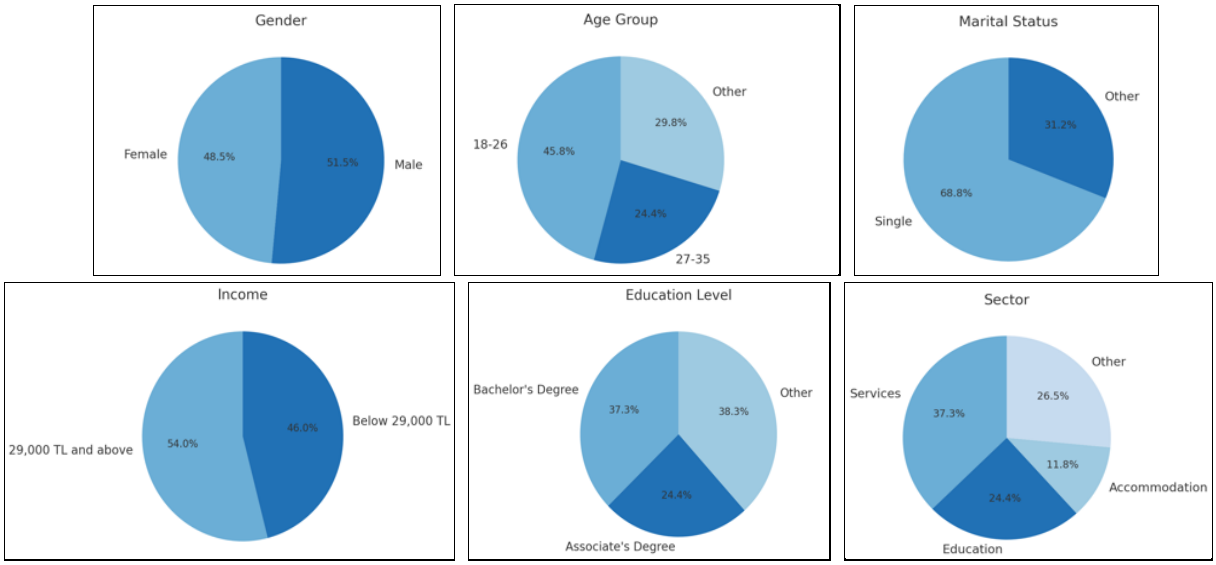


Figure 2. Demographic characteristics

In terms of education level, 37.3% of the participants have a bachelor's degree and 24.4% have an associate's degree. In terms of the sectors in which the participants are working, the services sector is the highest with 37.3%, the education sector with 24.4% and the accommodation sector with 11.8%. 54% of the participants stated that they have a monthly income of 29.000 TL and above. Between February 2024 and May 2024, when the research was conducted, the monthly minimum wage in Türkiye was 17.002 TL net. Accordingly, it can be said that more than half of the participants have an income at least 60% or more above the minimum wage.

Findings related to the research model

Partial least squares structural equation modeling, which does not require multivariate normal distribution assumption, was used to fit the model. The role of the perceived step in Maslow's theory of human motivation on the effect of participants' attitudes towards eco-conscious dining venues on their purchase intents was examined. The data were analyzed using Smart-PLS 4 statistical software.

Validity of the model

Before the analysis of the structural model created to measure the relationships between the variables in this study, validity and reliability studies of the variables in the study were carried out. Within the scope of validity and reliability studies, internal consistency reliability, convergent validity and discriminant validity were evaluated. For internal consistency reliability, Cronbach's alpha and composite reliability (CR = Composite Reliability) coefficients were examined. Factor loadings and average variance explained (AVE = Average Variance Extracted) values were used to determine convergent validity. Factor loadings ≥ 0.70, Cronbach Alpha and composite reliability coefficients ≥ 0.70, and average variance explained ≥ 0.50 are expected to be realized. Items with factor loadings between 0.4 and 0.7 can remain in the model in line with CR and AVE values (Hair et al., 2014). Since all of the variables in the research model had ≥4 items, Confirmatory Tetrad Analysis (CTA) was first conducted to determine whether the indicators of these variables were reflective or formative. After the analysis, "Cl low" and "Cl up" values were checked in the items related to the relevant variables. If there is a value of "0" between "Cl low" and "Cl up" values in at least one row, the indicators are reflective (Yılmaz et al., 2024: 103). As a result of the analysis, it was observed that there is a "0" value between "Cl low" and "Cl up" values in the values of all variables. Therefore, the indicators of the relevant variables are reflective and suitable for partial least squares structural equation modeling. After the CTA Analysis, reliability and validity analyses of the existing constructions in the study were conducted. In this context, factor loadings were first checked. The 9 items with factor loadings less than 0.4 were removed from the model and the analysis was repeated. To decide whether the items with factor loadings between 0.4 and 0.7 should remain in the model, CR and AVE values were examined. AVE values of the variables should be above 0.5. In the variables with AVE values below 0.50, the items with low factor loadings were evaluated and the items that did not contribute to the model (11 items in total) were removed from the it (In line with the removed items, the 2 dimensions of Maslow's theory of human motivation, physical needs and love needs, were removed from the model). Table 1 shows the results of the internal consistency reliability and convergent validity of the constructions in the study.

Table 1. First level and second level measurement model results

First Level : STRUCTURE	**Expression**	**Factor Load**	**Cronbach's alpha**	**CR**	**AVE**
Attitudes towards Green Restaurants	AG2 AG3 AG4 AG5	0.682 0.720 0.682 0.847	0.828	0.832	0.542
Consumption Intention	CON1 CON2 CON3 CON4 CON5	0.713 0.839 0.669 0.575 0.834	0.849	0,864	0.537
Security Needs	SN1 SN3 SN4	0.709 0.589 0.959	0.833	0.846	0.510
The Need for Respect	EN2 EN3 EN4 EN5 EN6	0.609 0.744 0.798 0.778 0.619	0.759	0.845	0.554
Need for Self-Actualization	SEN1 SEN2 SEN3 SEN4 SEN5	0.834 0.833 0.842 0.713 0.613	0.880	0.889	0.596
Second Level: STRUCTURE	**Size**	**Factor Load**	**Cronbach's Alpha**	**CR**	**AVE**
Maslow's Hierarchy of Needs	Security Needs The Need for Respect Need for Self-Actualization	0.752 0.709 0.767	0.846	0.851	0.507

When the results of the measurement model are examined, it can be said that internal consistency reliability is ensured since the Cronbach Alpha coefficients of the constructs of the items in the model are between 0.759 and 0.880 and the CR coefficients are between 0.832 and 0.889. At the same time, since the factor loadings were between 0.575 and 0.959 and the AVE values were between 0.507 and 0.596, it can be said that convergent validity was achieved.

HTMT criterion was used to determine the discriminator validity of the measurement model. HTMT (Heterotrait - Monotrait Ratio) expresses the ratio of the mean of the correlations of the expressions belonging to all variables in the research (the heterotrait - heteromethod correlations) to the geometric means of the correlations of the expressions belonging to the same variable (the monotrait - heteromethod correlations). The HTMT value should theoretically be below 0.90 for close concepts and below 0.85 for distant concepts (Yılmaz et al., 2024). Table 2 shows the HTMT values.

When the values in Table 2 are analyzed, it is seen that the HTMT values are below the threshold value. In other words, according to the findings in the table, it can be said that discriminant validity is ensured.

Table 2. Discriminant validity results (HTMT Criterion)

HTMT Criterion for First Level Structures					
	Attitude toward Green Restaurants	**Consumption Intention**	**Esteem Needs**	**Safety Needs**	**Self Act. Needs**
Attitude toward Green Restaurants					
Consumption Intention	0.800				
Esteem Needs	0.155	0.115			
Safety Needs	0.158	0.174	0.359		
Self Act. Needs	0.160	0.159	0.658	0.524	
HTMT Criterion for Second Level Structures					
	Maslow's Hierarchy of Needs				
Maslow's Hierarchy of Needs					
Maslow's Hierarchy of Needs x Attitude toward Green Restaurants	0.074				

Table 3. Structural model results

Structural Relationships	**VIF**	**R^2**	**f^2**	**Q^2**
Direct Impact				
Attitude toward Green Restaurants → Consumption Intention	1.170	0.689	1.961	0.460
Moderator Impact				
Safety Needs **X** Attitude toward Green Restaurants →Consumption Intention	1.688	-	0.032	-
Esteem Needs **X** Attitude toward Green Restaurants →Consumption Intention	2.694	-	0.017	-
Self Act. Needs **X** Attitude toward Green Restaurants →Consumption Intention	2.610	-	0.061	-

Evaluation of the structural model

Partial least squares structural equation modeling algorithm was used to calculate R2 and effect size (f2) and Blindfolding analysis was used to calculate predictive power (Q2) for the structural model. R2, f2, Q2 and VIF values for the structural model results are presented in Table 3. In the evaluation phase of the structural model, VIF (Variance Inflation Factor) values were first analyzed. As seen in Table 3, VIF values below 5 indicate that there is no problem of multiple internal relationship between variables (Yılmaz et al., 2024). When the R2 values obtained from the model were analyzed, it was determined that the model explained 69% of the purchase intent variable. In the evaluation of the effect size coefficient, f2 values were analyzed. An effect size coefficient (f2) of 0.02 and above is considered low, 0.15 and above is considered medium, and 0.35 and above is considered high (Cohen, 1988).

When Table 3 is analyzed, the effect of attitude toward eco-conscious dining venues on action orientation is quite high. It can be said that Maslow's theory of human motivation dimensions, whose f2 value is calculated as 0.032 in the study, affects the relationship between attitude toward eco-conscious dining venues and purchase intent at a low level according to Cohen (1988). The fact that the predictive power coefficients (Q2) calculated for the dependent variables are greater than zero indicates that the structural model has the power to predict the dependent variables (Hair et al., 2014). The fact that the Q2 values in Table 3 are greater than zero indicates that the structural model has the power to predict the purchase intent variable.

Another value used to assess model fit is the GoF index. The GoF index was developed to determine the performance of both the measurement model and the structural model and to provide a standardized measure for the prediction performance of the whole model. The GoF index takes values between 0 and 1. The degrees of fit of the GoF index are GoF = 10 (poor), GoF = 0.25 (moderate), GoF = 0.36 (very good) (Wetzels et al., 2009). The GoF index is obtained by taking the square root of the product of the AVE and R2 values obtained for the latent variables.

$GoF = \sqrt{\text{Average}\ (R2) \times \text{Average}\ (AVE)}$

$GoF = \sqrt{0{,}689 \times 0.548} = 0.61$

The average of the R2 values is 0.689 and the average of the AVE values is 0.548 and the GoF index is 0.61. Since the value obtained is above 0.36, it can be said that the model has a very good fit.

Path coefficients and hypothesis testing

To test the structural relationships in the model (hypothesis testing) and to assess the statistical significance of the indicators in the model, Bootstrap analysis, a resampling method (bootstrapping) run with 5000 subsamples, was conducted. In general, Bootstrap (resampling) is a nonparametric resampling procedure that assesses the variability of a statistic by

examining the variability of sample data, rather than using parametric assumptions to assess the precision of estimates (Streukens & Leroi-Werelds, 2016). The results of the bootstrap analysis are presented in Table 4. According to the results of the analysis, the independent variable attitude toward eco-conscious dining venues positively and significantly affects the dependent variable purchase intent (Attitude toward Green Restaurants Consumption Intention: 0.689; t=19.972; p=0.000).

Table 4. Path Coefficients and hypothesis test results *p<0.05 significant

RELATIONSHIPS	Standardized β	Standard error	t value	p value	Conclusıon
Direct Impact					**H_1**
→Attitude toward Green Restaurants Consumption Intention	0.689	0.034	19.972	**0.000***	**H_1 Supported**
Moderating Effect					**H_2**
→Safety Needs **X** Attitude toward Green Restaurants Consumption Intention	0.097	0.043	2.249	**0.025***	**H_{2a} Supported**
→Esteem Needs **X** Attitude toward Green Restaurants Consumption Intention	0.032	0.048	0.667	0.505	H_{2b} Not Supported
Self Act. →Needs **X** Attitude toward Green Restaurants Consumption Intention	-0.086	0.050	1.731	0.084	H_{2c} Not supported

A one unit increase in positive attitudes towards eco-conscious dining venues will increase purchase intent by 0.689 units. Therefore, the alternative hypothesis is supported, and the null hypothesis is rejected. On the other hand, only one of the dimensions of Maslow's theory of human motivation, which is the moderating variable in the study, was found to play an intervening factor between the independent variable, attitude towards eco-conscious dining venues, and the dependent variable, purchase intent. According to the path analysis results, safety needs show a statistically significant and positive moderating effect between attitude towards eco-conscious dining venues and purchase intent (t= 2.249; p=0.000). Thus, a one-unit increase in perceived positive evaluations of safety needs positively moderates the effect of attitude towards eco-conscious dining venues on purchase intent by 0.097 units. The structural equation model and path coefficients are shown in Figure 3.

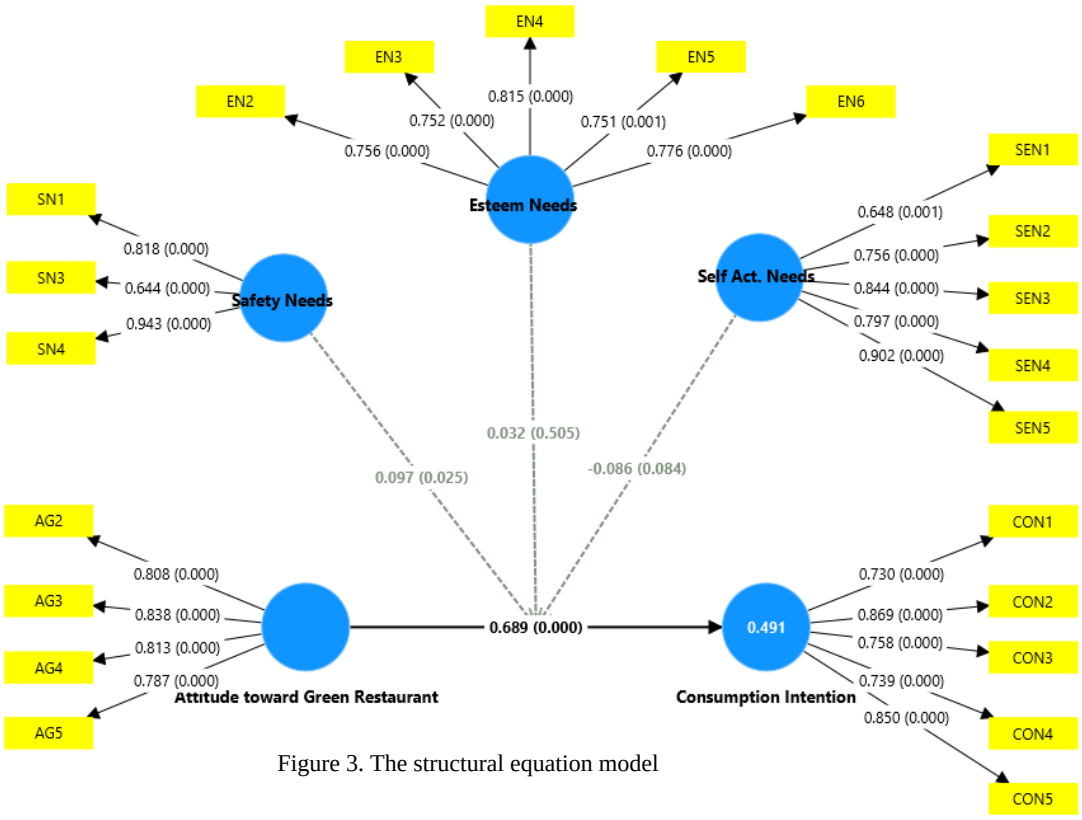


Figure 3. The structural equation model

RESULTS AND DISCUSSION

The findings of this study shed light on the dynamics between consumer attitudes and purchase intents in the context of eco-conscious dining venues in Türkiye. By employing questionnaire-based approaches and structural equation modeling analysis, the research has provided valuable insights into how consumers' attitudes towards eco-conscious dining venues influence their intention to patronize these establishments. The primary result of the study indicates a positive and significant relationship between Attitude Toward Green Restaurants and Consumption Intention. This suggests that consumers with a favorable attitude towards eco-conscious dining venues are more likely to intend to frequent such establishments. This finding is consistent with previous research that highlights the role of positive consumer attitudes in driving behavioral intentions, especially in the context of sustainability and environmental consciousness. Likewise, in the research by Riva et al. (2022), restaurants' green practices and services increase perceived value in the minds of customers, and this increase in value perception leads to higher levels of revisit intentions.

The analysis demonstrated a strong positive correlation between consumer attitudes toward eco-conscious dining venues and their purchase intentions ($\beta = 0.689$; $p < 0.001$). This indicates that favorable perceptions of such establishments significantly drive the likelihood of consumers patronizing them. Among Maslow's dimensions, only safety needs emerged as a statistically significant moderator ($\beta = 0.097$; $p = 0.025$). This suggests that concerns related to food safety, environmental impacts, and credibility of green claims amplify the effect of positive attitudes on purchase intentions. This implies that consumers' need for security—such as assurances about food safety, environmental impacts, and the credibility of green claims—can influence how their attitudes translate into actual purchase intents. This moderating effect underscores the importance of addressing security concerns in the marketing and operational strategies of eco-conscious dining venues to effectively engage and retain consumers.

Also, this result shows that people have neither any purchase intent in eco-conscious dining venues to just satisfy their hunger needs as in physical needs, nor to satisfy their love and belonging needs such as showing being in a green restaurant as a cultural identity. This result shows differences from the findings of similar research, which indicates that the enjoyment of the dining experience and the status it offers are significant motivators for consumers to visit these restaurants, and that their intentions to visit can influence their family, friends, acquaintances, and the restaurant's overall popularity as a destination (Daries et al., 2024). The esteem and self-actualization needs were analyzed as potential moderators but did not show significant effects. This finding suggests that while personal growth and social status might influence some consumption behaviors, they are less relevant in the context of eco-conscious dining venues.

Approximately 70% of respondents were young adults (18-35 years), highlighting the importance of targeting this demographic in eco-conscious marketing strategies. Additionally, more than half of the participants reported incomes significantly above the minimum wage, suggesting that higher income levels may correlate with green consumption preferences. Participants from the services sector represented the largest group (37.3%), followed by the education sector (24.4%). This indicates potential sectoral differences in awareness and attitudes toward green dining practices.

The results underline the pivotal role of consumer attitudes in fostering sustainable consumption behaviors, particularly in the context of green restaurants. Consistent with prior research (Wu et al., 2013; Filho et al., 2017), the study confirms that positive attitudes toward eco-conscious dining venues significantly enhance purchase intentions. This aligns with the broader theory of planned behavior, where attitudes are a critical determinant of intention formation. The significant moderating effect of safety needs emphasizes that consumers prioritize assurances about health and environmental safety when evaluating green dining options. This finding resonates with post-pandemic shifts in consumer behavior, where health-consciousness has become a central concern (Arun et al., 2021). Green restaurant operators should, therefore, invest in transparent communication about food safety measures, sourcing practices, and sustainability certifications to build consumer trust. Contrary to expectations, esteem and self-actualization needs did not exhibit significant moderating effects. This suggests that while these needs may drive other forms of consumption, they are less influential in the decision-making process for eco-conscious dining.

This finding challenges the assumption that consumers patronize green restaurants primarily for social status or self-expression. The demographic profile of participants indicates that younger, higher-income consumers are more inclined toward green consumption. This aligns with studies highlighting the generational shift towards sustainability and ethical consumerism (Riva et al., 2022). Green restaurants should focus on engaging this segment through digital marketing and social media platforms, which are popular among younger demographics. The dominance of participants from the services and education sectors suggests varying levels of awareness and engagement with green practices across industries. Targeted campaigns to educate and inspire professionals from other sectors could broaden the customer base for eco-conscious dining venues.

CONCLUSION

Given the findings of this study, which highlight the significant impact of Attitude Toward Green Restaurants on Consumption Intention, with the need for security acting as a crucial moderating factor, several practical recommendations can be made for green restaurant operators and marketers such as enhancing communication on safety and sustainability.

To leverage the positive attitudes towards eco-conscious dining venues and drive purchase intents, it is essential for eco-conscious dining venues to effectively communicate their commitment to safety and sustainability. Clear, transparent messaging about food safety measures, environmental practices, and certifications can address security concerns and reinforce positive consumer attitudes. Addressing the need for security by investing in visible safety practices and certifications can enhance consumer trust. Green restaurants should consider implementing and prominently displaying third-party certifications for food safety and eco-friendly sustainability to reassure consumers about the credibility of their green claims.

This research may support the idea of personalized marketing strategies by developing targeted marketing strategies that address the specific security concerns of different consumer segments. For instance, consumers who prioritize food safety might respond well to detailed information about sourcing and preparation practices, while those focused on environmental impact may appreciate transparency about the restaurant's eco-friendly initiatives. This ongoing research can help eco-conscious dining venues adjust their strategies to better align with consumer expectations and maintain a strong influence on purchase intents. By implementing these suggestions, eco-conscious dining venues can better align their operational practices with consumer expectations, thereby enhancing their appeal and encouraging increased patronage.

Future researches could build on these findings by exploring additional moderating variables that may impact the relationship between consumer attitudes and purchase intents. Additionally, expanding the scope to include diverse geographic regions and cultural contexts could provide further insights into the generalizability of these results. By continuing to investigate these dynamics, researchers and practitioners can better tailor strategies to promote sustainable consumer practices and support the growth of green dining establishments.

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INTEGRATING DISASTER MITIGATION AND ECOTOURISM: A MODEL OF SUSTAINABLE DEVELOPMENT AND TURTLE CONSERVATION IN NAGARI AMPIANG PARAK

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Abstract: This research aims to develop a disaster mitigation-based ecotourism model in Nagari Ampiang Parak, integrating ecotourism management, turtle conservation, and local entrepreneurship with disaster mitigation strategies. The research addresses the need to simultaneously enhance community resilience and economic stability in disaster-prone coastal regions. A mixed - methods approach combined ethnographic qualitative studies with quantitative data collection through structured questionnaires. Qualitative methods included in-depth interviews with community leaders, ecotourism stakeholders, and residents, while quantitative data focused on disaster awareness, economic benefits, and conservation participation. The research spanned one year, allowing for a comprehensive analysis of community practices and outcomes. This research develops a disaster mitigation-based ecotourism model in Nagari Ampiang Parak by integrating turtle conservation, local entrepreneurship, and environmental management. The findings show that 57% of respondents are aware of disaster risks, and 53% participate in preparedness activities. Ecotourism and conservation involve 53%-57% of the community, with mangrove planting and turtle protection as key strategies. Economically, 50%-55% of respondents feel ecotourism increases income, new businesses, and job opportunities. Turtle conservation is also seen to protect biodiversity (65%) and contribute to disaster mitigation (63%). This model strengthens community resilience by combining environmental sustainability with local economic empowerment in disaster-prone areas. The research also shows that community empowerment through leadership roles, social cohesion, and active participation in conservation strengthens resilience and sustainability. Environmental efforts such as mangrove planting and turtle protection offer dual benefits for ecosystems and disaster reduction while increasing public awareness, strengthening local capacity, and supporting environmental education programs. The research concludes that the proposed ecotourism model boosts community resilience by balancing economic growth with environmental conservation. This integrated approach reduces disaster vulnerability and fosters sustainable livelihoods through innovative and entrepreneurial practices. The findings highlight the potential of this model to serve as a blueprint for other coastal regions facing similar challenges.

Keywords: disaster mitigation, ecotourism, turtle conservation, sustainable development, Nagari Ampiang Parak

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INTRODUCTION

According to Article 1, point 1 of Republic of Indonesia Law No. 24/2007 concerning "Disaster Management", a disaster is defined as an event or a series of events that threaten and disrupt the lives and livelihoods of communities (Hermansyah et al., 2024). These events can be triggered by natural, non-natural, or human-induced factors, resulting in loss of life, environmental degradation, destruction of property, and psychological impacts (Sulistiani et al., 2024).

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West Sumatra, one of Indonesia's most disaster-prone provinces, frequently faces the threat of tsunamis, with Pesisir Selatan Regency situated along its vulnerable coastline. Sutera Sub-district, Pesisir Selatan Regency has been categorized into five levels of tsunami hazard zones, determined by specific environmental parameters. These parameters include the distance from river flow, proximity to the coastline, land use, elevation, and slope, all of which influence the severity of tsunami risk in the region (Stanford et al., 2013; Putra & Mutmainah, 2016; Dyah et al., 2019). To mitigate disaster risks, both physical infrastructure development and enhanced community awareness are necessary to improve the capacity to face potential threats. This process aligns with Article 1, point 6 of Government Regulation No. 21/2008, which defines disaster mitigation as part of disaster management. According to Article 3 of the same regulation, disaster management is divided into three key phases, namely pre-disaster, emergency response, and post-disaster recovery.

By prioritizing ecological restoration and integrating disaster preparedness into local development strategies, communities like Nagari Ampiang Parak exemplify how sustainable practices can enhance long-term disaster resilience.

More than half of the Ampiang Parak area is located along the coast, including several islands. All marine waters and beaches in the region are part of the Marine Conservation Area (MCA) of Pesisir Selatan Regency (Marbun, 2020; Zamzami & Aliman, 2021; Putra et al., 2024; Febriandi et al., 2025). The coastal zone of Ampiang Parak is renowned for its biodiversity and ecological richness, making it an ideal habitat for turtles to nest and reproduce. The data indicate the presence of turtle species in the area, the Green Sea Turtle (*Chelonia mydas L.*) is a rare species, and its extinction would cause a significant ecological loss. Therefore, efforts to preserve their habitats and protect their populations are essential. Ultimately, the coastal area of Nagari Ampiang Parak has been transformed into both an ecotourism destination and a turtle conservation center. Since becoming an ecotourism and conservation area, the community has experienced several prominent changes, especially in the economic sector. New businesses have emerged that the community had never undertaken before.

In recent years, research has increasingly emphasized the significance of integrating disaster mitigation strategies into ecotourism-driven development (Sumarni et al., 2023; Arinta & Susilo, 2023). However, recent findings also highlight the need for broader community engagement and cross-sectoral coordination in implementing such strategies, as fragmented governance structures often hinder the effectiveness of ecotourism-based mitigation interventions. Nevertheless, these studies often concentrate solely on coastal protection measures, neglecting to comprehensively address opportunities for fostering local entrepreneurship (Suryawan et al., 2024). A more comprehensive framework is required, one that simultaneously promotes biodiversity conservation and socio-economic advancement (Francolini et al., 2023). For example, Zhang et al. (2024) discovered that community-based coastal management can reduce tsunami vulnerability by over 30%; however, their research fell short of exploring ways in which local communities might harness ecotourism's potential to enhance economic resilience. Similarly, Pascal et al. (2021) demonstrated the contributions of protected marine areas to conservation objectives but did not investigate how these areas might be aligned with initiatives to support local entrepreneurship. Additionally, Valdecañas & Cuyegkeng (2023) highlighted the importance of stakeholder collaboration in achieving successful turtle conservation efforts but did not provide details on integrating disaster mitigation measures with conservation activities.

Consequently, the existing body of literature underscores the pressing need for a more integrated approach one that synergizes disaster mitigation, ecotourism, and conservation while emphasizing not only the preservation of natural habitats but also the empowerment of local economies through skill-building programs, infrastructural support, and policy coherence.

Several limitations emerge from the reviewed studies. First, there is a recurring tendency to address either ecological or socio-economic aspects in isolation, rather than considering them as interdependent components. Second, many studies are constrained by short-term assessments of conservation outcomes, lacking longitudinal evaluations that capture both long-term ecological and socio-economic impacts. Third, a notable gap exists in the formulation of evidence-based policy recommendations that explicitly incorporate disaster mitigation strategies into ecotourism activities. These shortcomings indicate that future research should prioritize a multidimensional approach and extend the observation period to fully explore the potential of disaster mitigation-focused ecotourism (Suasti et al., 2020). This research aims to develop a comprehensive disaster mitigation-based ecotourism model in Nagari Ampiang Parak. More specifically, the research seeks to integrate three key elements, namely ecotourism management, turtle conservation, and local entrepreneurship into a robust framework that simultaneously addresses the community's vulnerability to natural disasters.

Sherman (2022) underscores the role of disaster-focused ecotourism initiatives in enhancing community preparedness by integrating local stakeholders into coastal management programs, thereby highlighting the importance of participatory approaches. Where Islam (2024) examines the synergy between turtle conservation and sustainable tourism, illustrating how collaborative efforts among communities, government agencies, and NGOs can boost both biodiversity protection and local incomes. Rahaman et al. (2024) expand on this notion by investigating the role of entrepreneurship in strengthening the economic resilience of coastal communities, emphasizing capacity-building strategies that empower small-scale businesses to adapt to environmental and market changes. Larsen et al. (2023) add a comparative perspective by analyzing ecotourism practices in disaster-prone regions, showing that proactive mitigation planning encompassing early warning systems and thorough risk assessments significantly reduces the socio-economic impacts of natural disasters. More recently, Chen et al. (2024) highlight the potential of integrating technological innovations, such as drone monitoring and digital platforms, into ecotourism development, illustrating how real-time data collection can bolster environmental conservation efforts while enhancing visitors' overall experience. The focus of the research is to integrate ecotourism management, turtle conservation, and local entrepreneurship with disaster mitigation strategies. The novelty of this research lies in its integrated approach that connects disaster mitigation with ecotourism management and turtle conservation, ultimately aiming to build socio-economic resilience while safeguarding critical habitats. Unlike previous studies that

emphasized entrepreneurship development before coastal area utilization. This research also highlights the dual benefits generated, namely increased disaster preparedness while encouraging local economic growth through sustainable tourism.

METHODS

This research adopted a mixed-methods approach, combining ethnographic qualitative studies with quantitative data collection through a structured questionnaire (Hasmira et al., 2021; 2023). The research spanned one year, allowing for a comprehensive analysis of local community practices, entrepreneurial developments, and disaster preparedness efforts.

Research location

Nagari Ampiang Parak is located in Sutera Sub-district, Pesisir Selatan Regency, West Sumatra Province, Indonesia with an administrative area of over 2800 hectares, situated at an altitude of 5 meters above sea level. Geographically, the area lies approximately at coordinates 1°35'16"S and 100°45'34"E. In research by Firdaus et al (2024). Nagari Ampiang Parak consists of six villages namely Alai Village, Pasar Ampiang Parak Village, Padang Tae Village, Ujung Air Village, Padang Laweh Village, and Koto Tarok Village, It is bordered to the north by Surantih Village and Aur Duri Village, to the south by West Kambang Village and North Kambang Village, to the west by the Indian Ocean, and the east by East Ampiang Parak Village. More details can be seen in Figure 1 below.

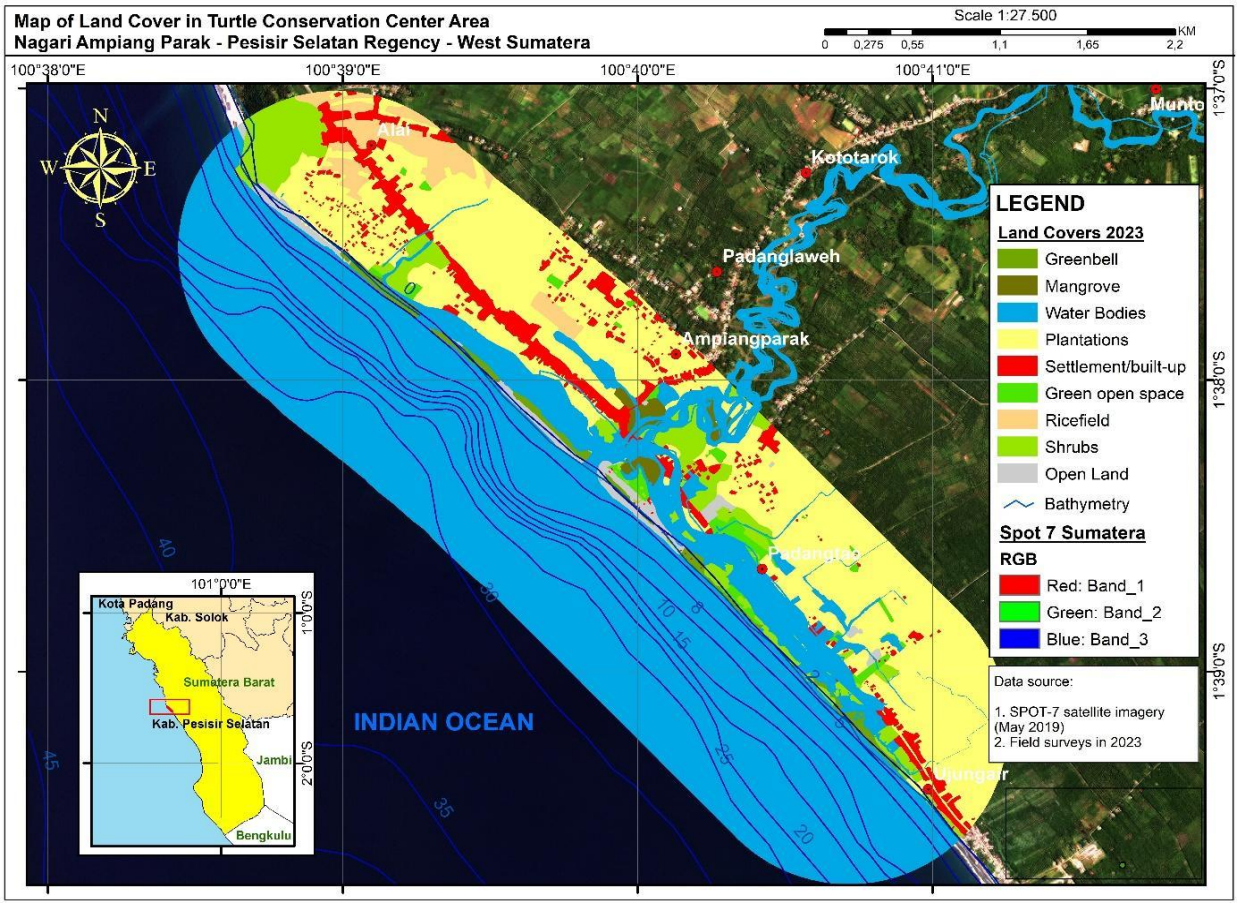


Figure 1. Map of Nagari Ampiang Parak coastal area showing land cover changes in 2023
(Source: SPOT-7 satellite imagery (May 2019), processed and validated through field surveys conducted in by the authors 2023)

Questionnaire designs

A structured questionnaire was used to gather quantitative data about the community's perceptions regarding disaster preparedness, ecotourism benefits, and turtle conservation. The questionnaire was divided into three sections. More details can be seen in Table 1 below.

Table 1. Questionnaire design for assessing community perceptions

Section	Question	Response options
Disaster preparedness	How aware are you of tsunami risks?	Very aware, Aware, Neutral, Unaware, Very unaware
	Are you involved in disaster drills?	Yes, No
Ecotourism impact	Has ecotourism improved your income?	Yes, No
	Have new businesses emerged in the community?	Yes, No
Turtle conservation	Have you participated in turtle conservation?	Yes, No
	Do you think turtle conservation is important?	Very important, Important, Neutral, Not important

Ethnographic methods were employed to gather qualitative data, focusing on the everyday practices of the community related to disaster preparedness, ecotourism activities, and local entrepreneurship (Matseketsa et al., 2018; Hasmira et al., 2023), namely 1) Interviews were conducted with key informants such as local leaders, ecotourism stakeholders, and community members; and 2) Observations were carried out to document the daily routines of the local community, particularly their conservation practices, such as turtle conservation efforts and environmental management.

Meanwhile, the questionnaire survey was designed to collect quantitative data on community perceptions regarding disaster preparedness, ecotourism benefits, and turtle conservation. The survey was distributed to 100 respondents selected using purposive sampling to ensure the representation of different stakeholders using sampling techniques, where in addition to purposive sampling, snowball sampling was employed to identify further participants (Nafesa et al., 2018).

The survey began with key informants such as Mr. Yendri, the Secretary of Nagari Ampiang Parak, who helped in identifying other relevant participants. The respondents included community leaders, ecotourism activists, communities involved in turtle conservation, and general community members. Next is the respondent profile, below in the Table 2 below outlines the respondent categories and their corresponding numbers.

Table 2. Respondent categories and their numbers

Respondent category	Number of respondents
Community leaders	5
Ecotourism activists	7
Turtle conservation participants	8
General communities	80
Total	100

Data analysis

The data analysis used both qualitative and quantitative methods to understand how the community engages in disaster preparedness, ecotourism development, and turtle conservation. The goal was to identify the links between disaster mitigation efforts, economic benefits from ecotourism, and community empowerment. Qualitative data were collected through interviews and participant observations, following an ethnographic approach. More details can be seen in Table 3 below.

Quantitative data were collected through a structured questionnaire distributed to 100 respondents. The analysis examined the relationships between these factors and their contributions to community empowerment and resilience, including disaster mitigation awareness, economic benefits from ecotourism, and community empowerment through conservation. Details are presented in Table 4 below. The quantitative analysis confirmed that disaster mitigation efforts, when integrated with ecotourism and conservation activities, not only reduced the community's vulnerabilities but also opened new opportunities for economic development. The strong correlation between disaster preparedness and community empowerment was evident, as individuals who actively participated in both ecotourism and disaster mitigation initiatives reported higher levels of income and a strengthened sense of community resilience.

Table 3. Key themes identified in qualitative data and percentage of respondents

Key Themes	%	Description
Disaster preparedness	75	This represents the percentage of respondents who showed awareness of disaster risks (especially tsunamis) and their preparedness efforts (e.g., disaster drills, education programs).
Community involvement	85	This refers to the proportion of respondents actively participating in ecotourism activities, such as turtle conservation, and their engagement in environmental protection.
Ecotourism's economic impact	60	This reflects the percentage of respondents who acknowledged that ecotourism has had a positive impact on their economic situation, including new business opportunities and infrastructure improvements.
Environmental conservation	70	This shows the percentage of respondents who are actively involved in environmental conservation efforts (e.g., mangrove planting) or who recognize the importance of these efforts in disaster mitigation and sustainability.

Table 4. Respondents' perceptions on disaster preparedness, ecotourism benefits, and community empowerment

Category	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
Disaster mitigation awareness	60%	30%	5%	3%	2%
Economic benefits from ecotourism	50%	35%	10%	3%	2%
Community empowerment	70%	25%	3%	1%	1%

RESULTS

Community awareness and preparedness for disasters

The findings reveal that 57% of respondents are aware of the risks of tsunamis and other natural disasters, and 53% actively participate in preparedness activities like drills and educational programs. This high level of awareness provides a solid foundation for disaster mitigation initiatives, particularly when integrated into ecotourism. Notably, the structured questionnaire used for the research revealed that 57% of the community strongly agrees and 37% agrees that disaster mitigation awareness positively affects their resilience. Community members' involvement in mitigation practices, such as periodic drills, evacuation routes, and educational sessions about disaster risks, signifies their readiness to manage natural calamities. More details can be seen in the graph in Figure 2 below. From Figure 2 above, it's evident that 57% of respondents (57% strongly agree, 37% agree) are aware of tsunami risks, with 53% participating in disaster drills (53% strongly agree, 40% agree). These data illustrate the community's robust engagement with disaster preparedness, which can be

harnessed to attract tourists interested in learning about resilience practices. Moreover, by involving visitors in disaster preparedness activities, the ecotourism model would promote active learning experiences, potentially enhancing both local income and disaster readiness. Paton (2007) reported that incorporating disaster preparedness into local tourism not only boosted tourism but also strengthened community resilience. This comparison underscores the importance of integrating disaster preparedness into the broader scope of ecotourism. Furthermore, Arifanti (2020) demonstrated that community awareness of disaster mitigation plays a crucial role in reducing the impact of natural disasters, especially in areas prone to coastal hazards. The findings from Nagari Ampiang Parak align with these studies, showing that a well-informed and prepared community is better positioned to manage disaster risks, and this preparedness can be effectively showcased through ecotourism. The integration of disaster preparedness into an ecotourism model in Nagari Ampiang Parak offers a dual benefit namely, it enhances community resilience while providing a unique, educational tourism experience. Given the community's strong awareness and involvement in disaster mitigation, this model could serve as a prototype for other coastal regions vulnerable to natural disasters, contributing to sustainable tourism development and local safety.

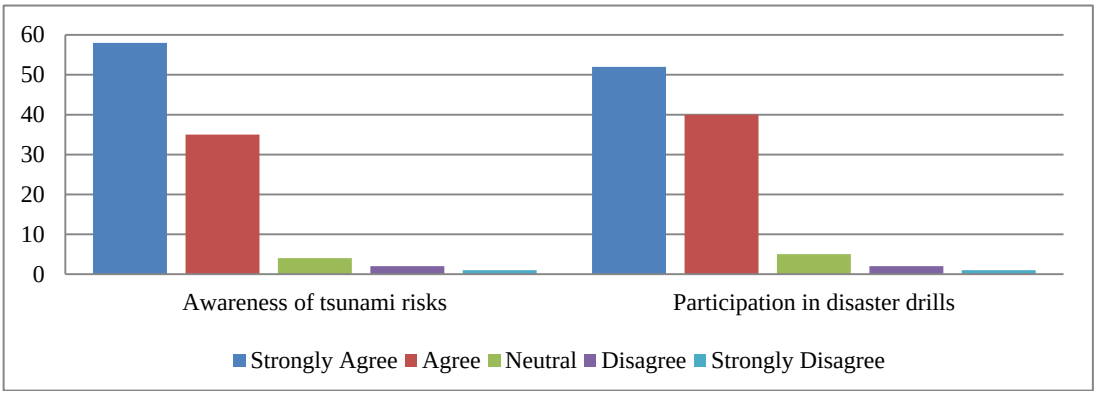


Figure 2. Graph of community perceptions of disaster preparedness

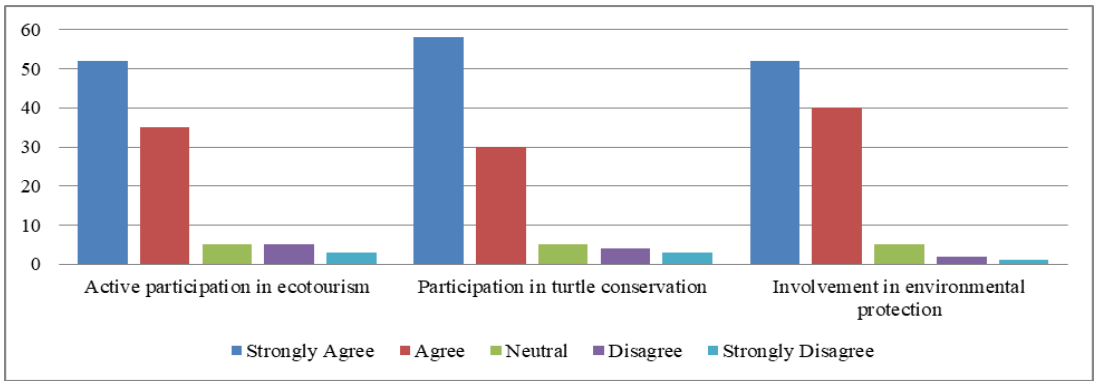


Figure 3. Graph of community involvement in ecotourism and conservation

Community involvement in ecotourism and conservation

The findings reveal that 53% of respondents are actively involved in ecotourism activities, such as turtle conservation and environmental protection efforts. This high level of engagement illustrates that the local community in Nagari Ampiang Parak plays a significant role in preserving their environment, directly contributing to disaster mitigation. A closer examination of community involvement in these activities reveals that conservation practices, including mangrove reforestation and wildlife protection, are essential for mitigating the impact of natural disasters, particularly coastal erosion and tsunamis. This aligns with the community's broader efforts to enhance environmental sustainability and resilience against disasters, further demonstrating the importance of integrating such initiatives into a broader ecotourism model. More details can be seen in the graph in Figure 3 below.

From Figure 3 above, 53% of respondents (53% strongly agree, 37% agree) are actively involved in ecotourism activities, while 57% also participate in turtle conservation efforts. Similarly, 53% of respondents are involved in environmental protection initiatives such as mangrove planting. These high levels of participation emphasize the community's commitment to both ecotourism and conservation, with a clear understanding that these activities also serve as mechanisms for disaster risk reduction. This collaborative approach between the local community and ecotourism stakeholders is vital for the region's sustainable development, ensuring that ecotourism is not just about profit but also about protecting the natural environment that sustains it. When comparing these results to similar research, Roy et al. (2021) highlighted the importance of local involvement in ecotourism as a critical factor for the success of conservation initiatives. Ecotourism involving the local community not only helps preserve biodiversity but also empowers the community economically. Towner & Orams (2016) reported that community-led turtle conservation projects in coastal areas have dual benefits namely they protect endangered species and also help mitigate the impacts of coastal erosion and storms. The strong involvement of the Nagari Ampiang

Parak community in ecotourism and conservation not only helps protect the environment but also plays a crucial role in mitigating disaster risks. The participation of community members in these initiatives ensures that the ecotourism model being developed will be sustainable and resilient, balancing environmental protection with economic growth (Zamzami et al., 2023), as shown in Figure 4 where the community has adopted turtles as a symbol for souvenirs in Nagari Ampiang Parak.



Figure 4. Turtle knitting work by mothers of Ampiang Parak Village as a symbol of ecotourism and conservation (Source: Documentation in 2023, souvenirs created by the community in Nagari Ampiang Parak)

Economic benefits of ecotourism

The findings reveal that 50% of respondents believe ecotourism has positively impacted their income, with new business opportunities emerging as a result of the increased tourism to Nagari Ampiang Parak. These findings are critical because they highlight the direct economic benefits that ecotourism has brought to the community. Small businesses such as homestays, guided tours, and local crafts have flourished due to the influx of tourists, particularly those interested in turtle conservation and environmental tourism. The creation of new job opportunities and local businesses has not only boosted the local economy but has also enhanced the community's resilience. More details can be seen in the graph in Figure 5 below.

From Figure 5 above, 50% of respondents (50% strongly agree, 40% agree) recognize that ecotourism has improved their income. Additionally, 48% (48% strongly agree, 45% agree) acknowledge that new businesses have emerged due to the growth in ecotourism, while 55% (55% strongly agree, 40% agree) also believe that ecotourism has created new jobs in the local area. Ecotourism has become a vital source of livelihood for many communities, particularly as more tourists visit to experience the region's natural beauty and conservation efforts. The economic benefits of ecotourism are evident in small-scale enterprises, such as local eateries, souvenir shops, and services like boat rentals or nature tours. Øvstetun & Cochrane (2014) found that ecotourism development in remote coastal areas in Indonesia significantly increased local household incomes by providing alternative livelihoods beyond traditional fishing or agriculture. Similarly, Cochrane (2007) noted that the emergence of local businesses related to ecotourism had improved community resilience in East Kalimantan. Created jobs that were not only sustainable but also closely aligned with protecting the environment and solidified the community's economic stability. Lastly, Ginting (2024); Osronita et al. (2024) demonstrated in their research on ecotourism in the Sumatran Highlands that local job creation was one of the strongest factors in fostering community empowerment. Job creation through ecotourism led to enhanced resilience, especially in regions prone to natural disasters, as ecotourism provided diverse and sustainable income streams. Ecotourism in Nagari Ampiang Parak has proven to be an essential driver of economic development, as evidenced by the majority of respondents reporting improvements in income and the emergence of new businesses. The integration of ecotourism with environmental conservation efforts has not only protected natural resources but has also created sustainable livelihoods for the local community (Zamzami & Effendi, 2023). This economic empowerment is crucial for building community resilience and ensuring long-term sustainable development in the face of both environmental and economic challenges.

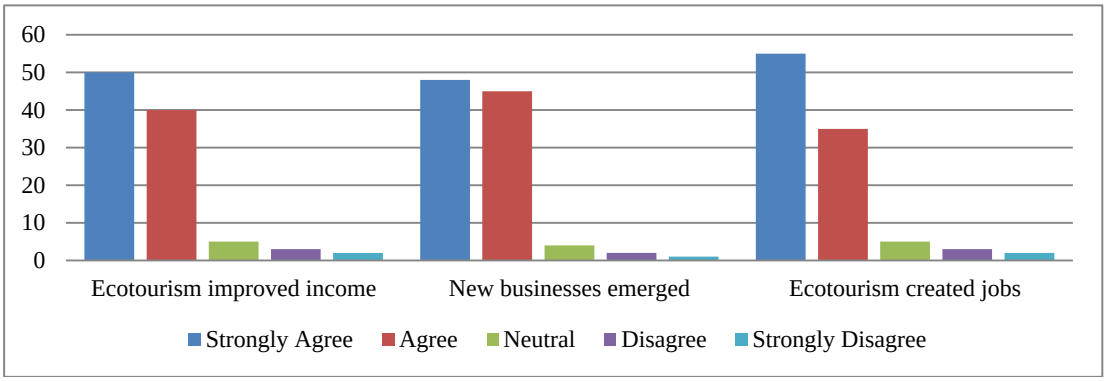


Figure 5. Graph of community perceptions of the economic benefits of ecotourism

Environmental conservation as part of disaster mitigation

The findings reveal that 53% of respondents actively participate in environmental conservation efforts, such as mangrove

planting and turtle conservation, which are directly linked to disaster mitigation strategies in Nagari Ampiang Parak. This community engagement is crucial for reducing the impacts of natural disasters, particularly tsunamis and coastal erosion, which are prevalent in coastal areas like Nagari Ampiang Parak. Environmental conservation efforts, such as mangrove restoration, not only help preserve biodiversity but also serve as natural buffers against tsunamis and storm surges. These initiatives highlight the dual benefit of conservation activities: protecting the environment while simultaneously reducing the vulnerability of the local community to natural disasters. More details can be seen in the graph in Figure 6 below.

From Figure 6 above, 53% of respondents (53% strongly agree, 37% agree) are actively involved in mangrove planting activities, which are critical for protecting coastal areas from erosion and tsunamis. Additionally, 52% of respondents participate in turtle conservation efforts, and 50% are involved in other conservation projects. These high levels of participation reflect the community's commitment to both environmental protection and disaster mitigation. The local conservation efforts focus on reinforcing the natural barriers that protect the community from disasters. Mangrove forests, for instance, have been shown to absorb wave energy, reducing the severity of coastal flooding. Similarly, turtle conservation, which contributes to maintaining a balanced ecosystem, indirectly supports environmental stability.

These conservation efforts form a key component of the disaster mitigation strategy in Nagari Ampiang Parak, blending environmental protection with community resilience. Sufri et al. (2020) demonstrated that community-based mangrove reforestation in Aceh significantly reduced the impact of coastal erosion and storm surges in protecting coastal areas from natural disasters, which aligns with the findings from Nagari Ampiang Parak. Similarly, Boakes et al. (2022) found that turtle conservation efforts in coastal areas of Bali had a dual benefit, protecting endangered species and maintaining healthy ecosystems that enhance natural disaster resilience. The strong community participation in environmental conservation in Nagari Ampiang Parak underscores the vital role of these activities in disaster mitigation. By actively engaging in mangrove planting, turtle conservation, and other projects, the local community is not only safeguarding their environment but also enhancing their resilience to natural disasters. These conservation efforts are integral to the development of a sustainable and disaster-resilient ecotourism model, which ensures long-term protection for both the community and the natural ecosystem.

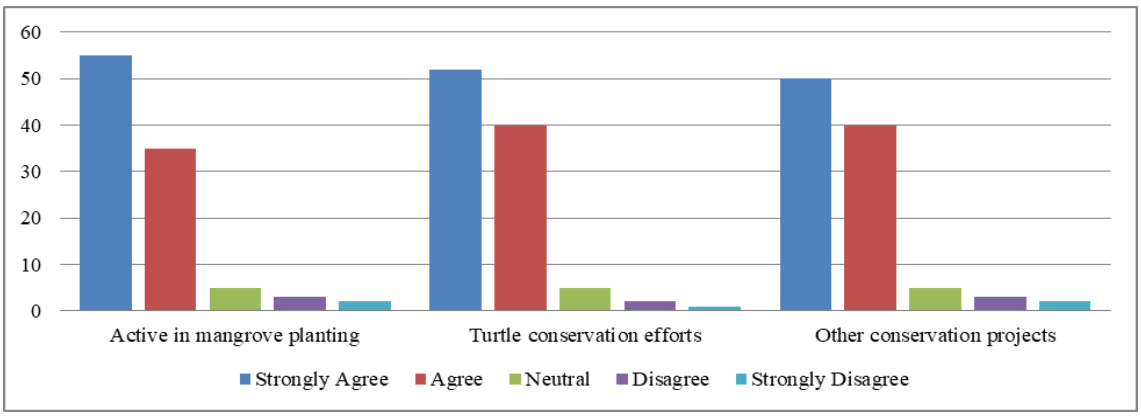


Figure 6. Graph of community participation in environmental conservation for disaster mitigation

Community empowerment and resilience

The findings reveal that 55% of respondents strongly agree that ecotourism and conservation activities have empowered the community and significantly enhanced their resilience against natural disasters. Community members have been able to leverage the financial gains from ecotourism to invest in disaster preparedness. 53% of respondents report that ecotourism has provided leadership opportunities, allowing them to take an active role in decision-making processes related to both tourism development and disaster mitigation. Additionally, 50% believe that the improved social cohesion fostered by these activities has made the community more resilient in the face of disasters. More details can be seen in the graph in Figure 7 below.

From Figure 7 above, 55% of respondents (55% strongly agree, 40% agree) believe that ecotourism and conservation efforts have empowered the community. In addition, 53% of respondents (53% strongly agree, 40% agree) feel that ecotourism has increased opportunities for local leadership. Finally, 50% of respondents (50% strongly agree, 40% agree) believe that improved social cohesion as a result of these activities has strengthened community resilience against disasters.

This reflects the wide-ranging impact that ecotourism has had on Nagari Ampiang Parak, where the economic, social, and environmental benefits have converged to create a more resilient and empowered community. Ecotourism's role in empowerment is not only financial but also includes providing opportunities for leadership and collaboration within the community, including providing a place for waste management as a concept for implementing environmental management (Martinez-Fernandez et al., 2021). These aspects are critical for fostering a sense of ownership over local development and disaster preparedness initiatives. The synergy between economic benefits, social empowerment, and disaster preparedness has contributed to making Nagari Ampiang Parak a model of resilience in the region. Blanton et al. (2024) showed that communities involved in ecotourism projects in Yogyakarta experienced increased resilience due to the financial and social benefits derived from tourism. Similarly, Dolezal & Novelli (2022) reported that community-led ecotourism projects in West Java strengthened local leadership, social ties, and disaster resilience. Ecotourism in Nagari Ampiang Parak has significantly empowered the community and strengthened resilience. Economic gains, leadership opportunities, and improved social

cohesion have increased self-sufficiency and preparedness for natural disasters. These findings support broader research, highlighting the value of integrating ecotourism with disaster preparedness to promote long-term resilience and empowerment.

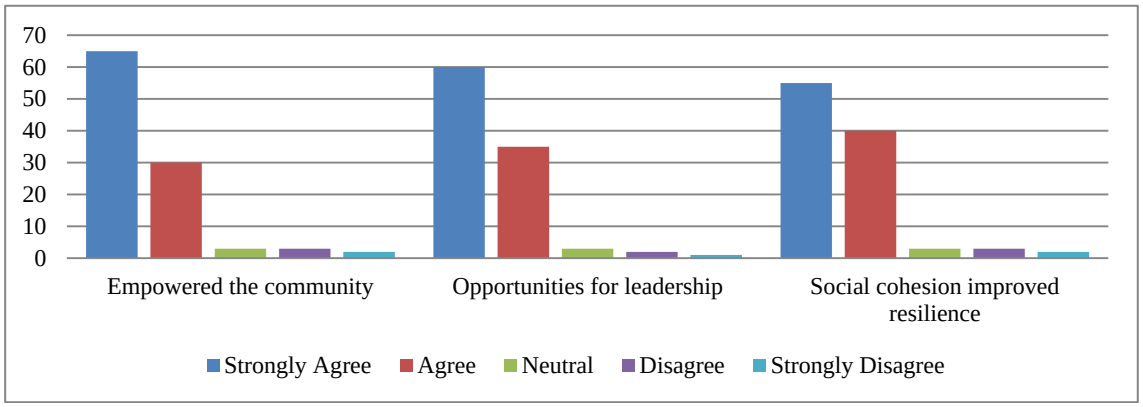


Figure 7. Graph of community perceptions of empowerment and resilience through ecotourism

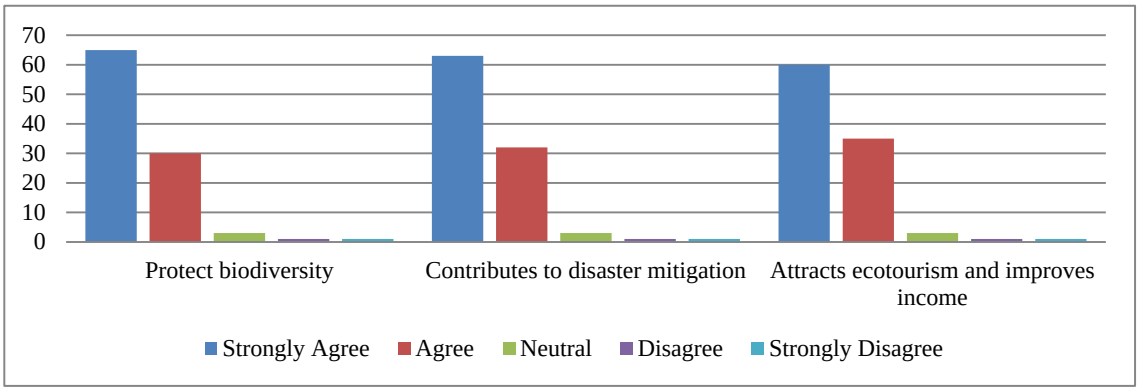


Figure 8. Graph of community perceptions of turtle conservation and its role in ecotourism and disaster mitigation

Turtle conservation as a symbol of ecotourism and disaster mitigation

Turtle conservation in Nagari Ampiang Parak symbolizes the blend of ecotourism and disaster mitigation. 65% of respondents strongly agree that it protects biodiversity and promotes environmental stewardship, contributing to disaster resilience. Conserving turtles and their habitats indirectly supports coastal resilience by preserving beaches and mangroves as natural barriers. Additionally, turtle conservation draws ecotourists, enhancing environmental awareness and disaster preparedness. This activity boosts sustainability and economic benefits, with 60% of respondents reporting improved incomes linked to turtle conservation, supporting community disaster readiness. More details are in Figure 8 below.

From Figure 8 above, 65% of respondents (65% strongly agree, 30% agree) believe that turtle conservation plays a significant role in protecting biodiversity, while 63% also recognize its contribution to disaster mitigation (63% strongly agree, 32% agree). Additionally, 60% (60% strongly agree, 35% agree) agree that turtle conservation has attracted ecotourism, resulting in economic benefits that help fund disaster preparedness and environmental protection efforts. This demonstrates the pivotal role of turtle conservation in linking environmental sustainability with disaster resilience. Turtle conservation in Nagari Ampiang Parak exemplifies how ecotourism can support both environmental protection and disaster mitigation. The turtle clinic plays a key role in these efforts. By preserving turtle habitats, the community maintains natural coastal defenses like beaches and mangroves, which help reduce the impact of tsunamis and storms. This enhances community resilience while attracting ecotourists, generating income for local disaster preparedness initiatives.

Holmes (2015) highlighted that communities engaged in turtle conservation experienced economic growth through ecotourism, which in turn helped fund disaster preparedness initiatives, but also fostered greater community awareness about environmental protection and disaster risk reduction, as observed in Nagari Ampiang Parak. Turtle conservation in Nagari Ampiang Parak exemplifies the synergistic relationship between ecotourism and disaster mitigation. By preserving these endangered species and their habitats, the community is not only safeguarding biodiversity but also enhancing its resilience to natural disasters. The economic benefits generated from ecotourism further support disaster preparedness, making turtle conservation a vital component of the region's sustainable development and resilience strategy.



Figure 9. Ecotourism model based on disaster risk prevention in Nagari Ampiang Parak

Ecotourism model based on disaster risk prevention

The ecotourism model proposed in Nagari Ampiang Parak integrates several key components disaster risk prevention, use of coastal areas, entrepreneurial culture, ecotourism, and turtle conservation with the local community at the center of these efforts. This model emphasizes the driving force behind ecotourism development, ensuring that tourism, environmental conservation, and economic growth are aligned with long-term sustainability goals. More details can be seen in the graph in Figure 9 below. Based on Table 5 below, the key activities in each component are outlined, focusing on their relevance to disaster mitigation, tourist involvement, and economic impacts on the local community. This summary highlights how each aspect supports environmental protection, economic growth, and regional resilience to natural disasters.

Table 5. Key components of the ecotourism model based on disaster risk prevention in Nagari Ampiang Parak

Component	Key activities	Relevance to disaster mitigation	Tourist engagement	Economic impact
Disaster risk prevention	Mangrove reforestation, sea pine planting	Protects coastline from erosion and tsunamis	Educational tours on coastal protection	Indirect, supports ecotourism infrastructure
Use of coastal areas	Sustainable tourism development	Ensures tourism doesn't harm coastal resilience	Visitors experience safe coastal zones	Direct, revenue from tourism activities
Entrepreneurial culture	Eco-friendly businesses, guided tours, souvenirs	Promotes sustainable business practices	Tourists purchase eco-friendly products	Direct, supports local economy
Ecotourism	Educational tours, conservation projects	Increases awareness of environmental conservation	Participation in conservation activities	Direct, boosts local income from tourism
Turtle conservation	Protecting Green and Hawksbill Turtles	Preserves biodiversity, strengthens coastal defenses	Key tourist attraction (turtle watching)	Direct, revenue from turtle-related tourism

As shown in Table 5, each component of the ecotourism model contributes not only to environmental protection and disaster mitigation. This integrated approach ensures long-term resilience and sustainability while promoting local entrepreneurship and attracting ecotourists through unique environmental conservation initiatives. The local community plays a central role in this ecotourism model, as illustrated in Figure 9. Their involvement is crucial at every stage, from disaster risk prevention to turtle conservation. Additionally, the entrepreneurial culture within the community drives the creation of sustainable businesses that align with long-term sustainability goals. Their active participation in both disaster mitigation and ecotourism guarantees the model's success, as the community is directly involved in implementing and maintaining initiatives that safeguard the environment while promoting economic growth.

The model has a significant impact on social, economic, and environmental dimensions, including: 1) Social impact, where the community-driven nature of this model fosters a culture of disaster awareness and preparedness. Community participation in conservation activities strengthens social cohesion and empowers individuals to take on leadership roles in disaster preparedness efforts; 2) Economic impact, where the promotion of sustainable local businesses ensures that economic growth is tied to the community's resilience to disasters and its commitment to environmental sustainability; and 3) Environmental impact, where the focus on turtle conservation and mangrove restoration ensures the preservation of critical ecosystems. Conservation efforts also ensure that the community can leverage its natural resources for tourism while protecting its environmental heritage. Unlike previous models that prioritize economic development, the ecotourism model proposed for Nagari Ampiang Parak offers a comprehensive approach that integrates disaster mitigation, environmental conservation, and sustainable economic growth. This model sets a precedent for other regions seeking to develop disaster-resilient and sustainable tourism initiatives, positioning Nagari Ampiang Parak as a pioneer in this field.

CONCLUSION

The research findings show that the integrated ecotourism model in Nagari Ampiang Parak effectively combines disaster mitigation, environmental conservation, and local entrepreneurship into a sustainable framework. A key outcome is the critical role of community awareness and involvement in disaster preparedness. With 53% of respondents actively participating in disaster drills and educational programs, a well-informed community is the backbone of disaster mitigation efforts. Additionally, the research emphasizes the importance of community-led conservation efforts, such as mangrove reforestation and turtle conservation, in enhancing coastal resilience. Ecotourism activities focused on environmental protection, particularly turtle conservation, have improved livelihoods, with 50% of respondents reporting increased income.

This synergy between environmental sustainability and economic growth highlights the model's success in both disaster mitigation and community empowerment. A strong awareness of disaster risks, with 57% of respondents acknowledging the risks of tsunami and other disasters, has driven the development of sustainable tourism and business ventures, strengthening the local economy and the community's capacity to withstand natural disasters. This approach has led to dual benefits, namely increased disaster preparedness and local economic growth through sustainable tourism. In conclusion, the ecotourism model developed in Nagari Ampiang Parak sets a precedent for sustainable development in disaster-prone regions, highlighting the importance of community leadership in resilience efforts.

By integrating environmental protection, disaster mitigation, and economic empowerment, the model offers a comprehensive and replicable strategy for other coastal areas seeking to balance ecological preservation with economic growth in the face of environmental threats. Although this research provides valuable insights into the effectiveness of the integrated ecotourism model in Nagari Ampiang Parak, which integrates disaster mitigation, environmental conservation, and local economic empowerment, several limitations must be acknowledged.

Firstly, the research's scope is limited to a single location (Nagari Ampiang Parak), which might reduce the generalizability of its findings to other coastal regions that exhibit different social, cultural, and ecological characteristics.

Secondly, the data were predominantly collected through surveys and field observations, which could introduce response bias from participants, particularly regarding their self-reported participation in disaster mitigation or environmental conservation activities. Finally, external factors such as climate change, governmental policies, and fluctuations in international tourism markets may have a significant impact on the long-term sustainability and effectiveness of this model, yet these factors were not comprehensively addressed in this research. Given these limitations, further research and cross-disciplinary collaboration are essential to refine and replicate this integrated ecotourism model in other coastal areas.

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THE ISSUE OF MOBILITY AND THE ROAD NETWORK WITHIN CITIES AND THEIR SURROUNDING AREAS: CASE STUDY OF THE CITY OF SOUR EL GHOZLANE, BOUIRA PROVINCE, ALGERIA

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Abstract: This paper examines urban transport issues in the historic city of Sour El-Ghozlane, located in the interior region of Algeria. It focuses on the limitations of transport infrastructure and the city's isolation due to a surrounding wall constructed during the Roman period in the 16th century BC, later restored between 1846 and 1862. While this wall has contributed to Sour El- Ghozlane 's status as a prime tourist destination, it has also created challenges in mobility, which has hindered local development. The ease of movement and road network density are crucial for facilitating economic, social, and cultural exchanges between urban and rural areas, which is essential for local growth. Like many Algerian cities, Sour El-Ghozlane has experienced significant urban and population expansion, leading to increased traffic congestion and an insufficient road network that no longer meets the needs of both drivers and pedestrians. Data from surveys and traffic statistics highlight the urgent need for improvements in transportation connectivity, road management, and infrastructure. The study proposes solutions such as creating a more organized road network, enhancing traffic signal systems, and designing consistent intersections. It also recommends urban planning measures like road expansion, tree planting, and promoting alternative fuel use and soft mobility. Furthermore, the planned railway line project is expected to stimulate regional and economic growth while preserving the city's historical heritage and addressing modern transportation needs. The development of an efficient road network is crucial for sustainable and inclusive local development and will promote the growth of domestic tourism in Algeria. The relationship between technological development and heritage preservation, as demonstrated by the challenges facing ancient cities such as Sour al-Ghozlane, is a topic of wide debate in contemporary academic circles. Through this scholarly article, which is primarily based on a field study of the road network and passenger and pedestrian traffic, we conclude that the shape and size of the road network in ancient urban areas have become unsuitable for modern transportation. They cannot accommodate the large flows of passengers and pedestrians resulting from population growth, nor do they accommodate the various reasons for travel (work, tourism, shopping, etc.). Therefore, developing the old centers of historic cities requires prioritizing investment in transportation.

Keywords: urban mobility, sustainable mobility, transport sustainability, networks, local development, historic center, Bouira province, Sour El Ghozlane city, intra-muros area, heritage and tourism, tourist city

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INTRODUCTION

Urban mobility has become a critical issue as cities worldwide face significant transformations in lifestyle and travel practices (Abbas et al., 2023)**.** These changes, resulting from rapid urbanization (Pandey et al., 2025) technological progress, and social dynamics, demand creative ways to analyze and control movement within urban areas (Müggenburg, 2015). The term urban mobility has emerged to capture complex travel practices and the close relationship between urban change and movement (Cascetta et al., 2007). Urbanization, defined as the increase in the proportion of people living in towns and cities (Siwei & Yongsheng, 2025), often leads to profound shifts in land use, economic activity, and social practices. This phenomenon is most commonly encountered in smaller urban centers, like Sour El Ghozlane, where rapid urbanization (Abbas et al., 2023), due to population growth, rural exodus (Zerrougui, 2025), and infrastructure development, has created unique challenges. These are resulting in higher housing demand, decentralization of projects away from the downtown area as well as a growing disconnection between the historic city center and its periphery (Young & Keil, 2010).

Sour El Ghozlane in addition to its main cultural and tourist heritage has been afflicted with urban movement problems including traffic jams and the lack of infrastructure to handle the modern requirements (Montoya et al., 2024). However,

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the city's center area, characterized by historical elements, such as the rampart and gate, is a vital junction between its historical and contemporary sections. However, the urban sprawl, the degradation of the center facilities, and the lack of public spaces have made the city less accessible and make it lose its potential as a regional hub.

This study aims to address these concerns by proposing sustainable mobility (Banister, 2008) strategies that combine heritage preservation with urban growth and tourism promotion (Young & Keil, 2010). Through a detailed analysis of the site and its surroundings, this research aims to bridge the gap between the historic and modern city while fostering sustainable growth (Park et al., 2025). Specifically, the study investigates:

- How Sour El Ghozlane can integrate innovative transportation models (Shamsuddoha et al., 2025) to improve mobility while preserving its historical character.
- The relationship between road networks, urban density, and sustainable development in the context of smaller historic cities (Kasture & Dhagat, 2025).
- The revitalization strategy for the historic city center and improving its role as a functional, vibrant and touristic urban space.

LITERATURE REVIEW

Urban transport is the lifeblood of cities (Wilkinson, 2003) Urban transport sustainability is of prime importance for achieving desired urban outcomes which impact economic, social and accessibility dimensions (Tong & Yorke-Smith, 2025). In many of the growing cities, everyday mobility is influenced by several factors which hinder sustainable and smart transport operations (Badassa, 2020). *Urban transport* is *vital* for connecting people to jobs, education, healthcare, and other *essential services* in *cities. This connectivity reflects the intrinsic relationship between transportation and urban planning*, meaning there is an interaction between land use and transportation (Shervin, 2025). The evolution of urban public transportation, which began in the 1960s (Puspitasari et al., 2025), has transcended borders and significantly impacted major cities. This transformation has prompted renovations and expansions of existing transportation networks. Essential modes, such as bicycles (Monteagudo et al., 2025) and walking, must be integrated into road network modeling and traffic planning. With the rapid growth of the urban population, the demand for transportation infrastructure has increased, emphasizing the need for effective mobility solutions to address congestion, enhance accessibility, and promote sustainable transportation (Ying Liu & Wei Su, 2021).

Key Dimensions of Urban Transport

Infrastructure is increasingly recognized as a fixed foundation for spatial mobility, encompassing both physical dimensions, such as transportation networks and facilities and conceptual dimensions, including the policies and social frameworks (Kherigi, 2025). Accessibility, defined as the ability to reach destinations or services-varies according to transportation modes and associated costs. While everything could theoretically be accessible, the economic implications raise critical questions about the true price of mobility. Addressing urban transportation issues requires an analysis of spatial, temporal, and economic factors (Perveen et al., 2020):

1. **Spatial Dynamics**: Structure of the network (Weiyao & Li, 2025), center-periphery relationship, urbanization induced by transportation roads, etc.
2. **Temporal Dimensions**: Historical time (urban planning and history), economic time (investment amortization), and daily time (time wasted in transportation).
3. **Economic Factors**: The cost of investments, the price paid by the user, and the charges borne by the community (Weiyao & Li, 2025).

Other dimensions, seemingly immeasurable, are linked to these three major aspects:

- **Quality of Transportation Services**: Encompassing various aspects such as physical comfort, aesthetics, regularity, etc.
- **Externalities**: Negative impacts associated with transportation systems, including noise pollution, air quality degradation, safety concerns, and traffic congestion. By integrating these dimensions, this report aims to provide a comprehensive understanding of the complexities inherent in urban transportation systems. According to the report of (Lamri et al., 2020), these dimensions constitute the challenges of transportation policy. Existing or recently constructed road networks often fail to account for the growth in automobile usage, resulting in doubled or even tripled travel times due to narrow roads and a lack of parking areas, thus hindering traffic, especially during peak hours. The city is a collection of buildings, structures, and communication networks that facilitate functions, work, rest, and leisure for the population.

Urban Mobility in Historical Contexts

Managing urban mobility in ancient city centers is complicated due to the requirement to maintain heritage while providing modern transportation options. The actions of urban mobility management have a direct impact on the preservation and protection of historical sites. The need of a Mobility Plan in historic towns is directly linked to the quest for territorial ordering and the appreciation of historical and cultural heritage that such cities represent (Dias et al., 2014).

Mobility plans in historic towns must integrate territorial planning with the protection of cultural and historical assets. Similarly (Moreno et al., 2025) underline the role of accessibility in maintaining the socio-economic and cultural heritage of historical sites. Sour El Ghozlane, a dynamic city and the cultural, economic, and financial capital of the Bouira province, continues to evolve by adapting its past to the present in order to shape its future, transforming it into a major urban center (Anis & Şeyda, 2025). Sour El Ghozlane, especially its "intra-muros" area (The Latin expression) "intra-muros" means within the walls, as of a city (Dictionary.com, 2024) , represents a vital intersection of historical preservation and urban usability. At the center of this part of the city stands a Roman-era wall, with large stone gates, showcasing the

city's ancient past. The area reflects the long history of the region, influenced by many civilizations, including the Romans, Byzantines, and Islamic dynasties. Originally called Auzia, the city was later renamed Aumale during French colonization before becoming Sour El Ghozlane, meaning "Fort of the Gazelles". Despite the fact that the intra-muros area is a key historical site, it faces modern issues like limited mobility due to the wall's design and minimal commercial activity. It remains an administrative center, but these challenges raise the question of how to improve accessibility and commerce while maintaining the area's rich heritage. These problems require the evolution of wise strategies to enhance accessibility, support the sustainable and cultural tourism, and revive the historical core while respecting historical heritage.

Global Relevance of the Case Study

The issues that the city of Sour El Ghozlane faces, are not unique only for this city, but could be pushed by any city. Historic urban centers worldwide struggle to balance heritage preservation with modern urban demands, making this study relevant at a global level. By investigating the integration of sustainable transport solutions and heritage conservation strategies, this research aims to contribute to the broader discourse on urban mobility and provide actionable insights for similar cities. This review reflects the research's objectives by summarizing the most important aspects of urban mobility, sustainability, and heritage preservation (Banister, 2008). The knowledge derived from the literature enables the creation of direct exploration of solutions to Sour El Ghozlane 's mobility challenges (Hussien et al., 2025).

METHODOLOGY

This study will primarily rely on data collected from various libraries (the University of Science and Technology Houari Boumediene and the Faculty of Geography and Territorial Planning Libraries) as well as various articles from various scientific journals including the Geojournal of Tourism and Geoscience as well as urban surveys. It was used a descriptive analytical approach to examine the geographical field, focusing on mobility and transportation within the city of Sour El Ghozlane, with particular attention to road networks and mobility within the intra-muros area and its periphery. Our analysis was based on a research sample of over 1000 individuals distributed across five zones within the urban agglomeration of Sour El Ghozlane. The surveys include the following steps:

1. **Descriptive Analysis of Questionnaire Variables:** We will analyze the variables included in the questionnaire to understand the characteristics of the sample population. This step will provide a detailed overview of the demographic and socio-economic profiles of the respondents.
2. **Analysis of Questionnaire Themes:** By calculating weighted averages and standard deviations, we aim to assess the perceptions of respondents regarding mobility and the road network in both the city center and its periphery. This will help us understand the general sentiment towards current transportation conditions.
3. **ANOVA Analysis:** We will employ ANOVA (Analysis of Variance) to identify significant differences between the main themes of the study, such as traffic plans, and between intra-muros and peripheral zones. This analysis will help determine how different factors influence mobility and road network effectiveness.

The comprehensive approach outlined will enable us to assess the current state of mobility and transportation networks in Sour El Ghozlane and provide valuable insights for future urban planning and policy-making.

STUDY AREA

The city of Sour El Ghozlane, Figure 1, historically known as the ancient city of Ksar, is an intra-muros settlement with a rich history. Originally a Roman fortress named AUZIA, established in 16 B.C. under Emperor Augustus, it served as a site of worship for the god Auzia as it was mentioned in the book of Ibn Khaldoun.

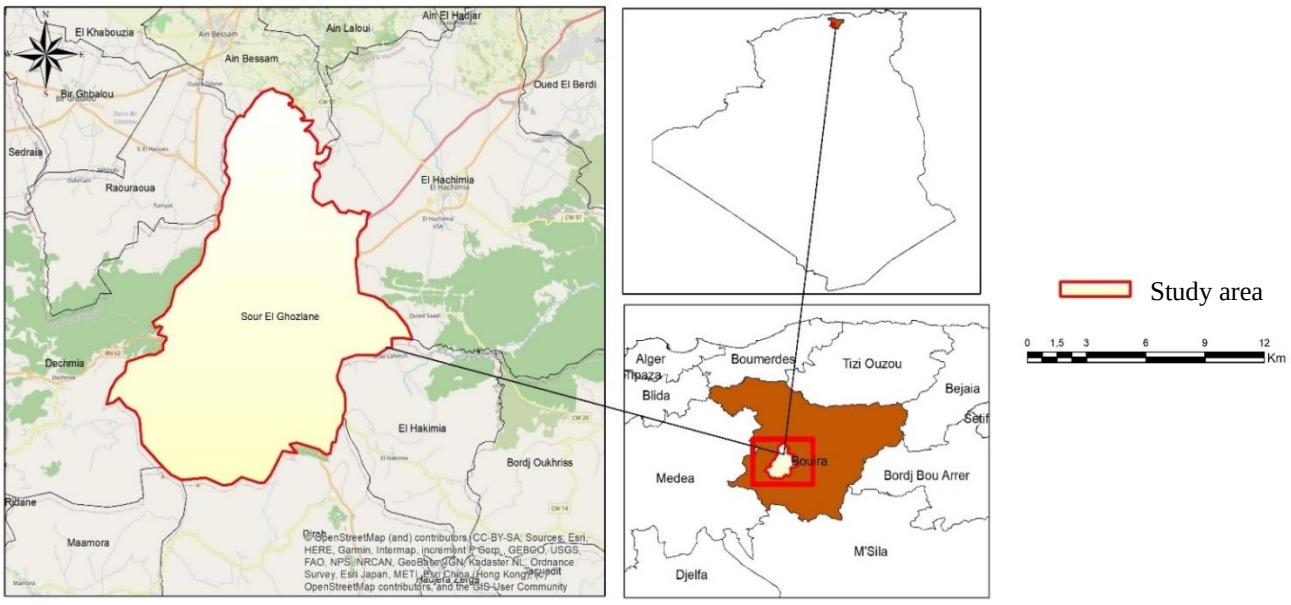


Figure 1. The geographical location of Sour El Ghozlane

During the Roman period, the site had a military function, defined by its southern, eastern, and western walls and the decumanus axis in the northern part (SID, 2025)**.** On May 27, 1843, the Duke of Aumale, son of King Louis-Philippe, laid the first stone of a new center (IBN-Khaldoun, 1854). The city was officially named Aumale on November 15, 1846.

Sour El Ghozlane has a long history as a garrison city, administrative center, and military establishment under various colonizers: Romans, Turks, and French, due to its strategic location and site morphology. The city retained its military function during the colonial period, which continued until the late 1990s after independence (CNERU, 2022).

During French colonial rule, the city was renamed Aumale. The name originated from an event. The intra-muros area of Sour El Ghozlane is situated on a small plateau that gently slopes from south to north. It spans 1,100 meters in length and up to 400 meters in width, surrounded by rocks and woods. The old ksar (intra-muros) covers an area of 37.70 hectares (Bousbaa, 2019). The city is located in the Bibans mountain range at an average altitude of 889 meters above sea level, at 36 degrees 9 minutes northern latitude and 0 degrees 21 minutes eastern longitude. Since the 1980s, the city has stabilized and now acts as a relay between the North and the High Plateaus (SID, 2025). In its regional context, the intra-muros area of Sour El Ghozlane is a vital exchange hub between the north and south, as well as the east and west. It is strategically positioned at the wilaya level, with excellent accessibility: 30 km south of the wilaya capital, Bouira, 80 km southeast of the national capital, Algiers (as the crow flies), and 130 km by road. Accessibility is reinforced by the East-West Highway and National Route No. 8, which connects Algiers to the tourist city of Boussâada, 130 km to the south. National Road No. 62 connects the wilayas of Médéa and Sétif, while the CW 127 links the city to the wilaya of Bouira. Sour El Ghozlane's strategic location facilitates smooth exchanges between the East and West and between the North and South (CENEAP, 2022).

MATERIALS AND METHODS

Urban Analysis: Field Study

Urban planning is the science of city development (Gulnara et al., 2024,)**,** focusing on studying and improving the creation and growth of cities. It involves specialists from various fields, including engineering, geography surveying, economics, sociology, landscape architecture, technical ecology, and legal and political sciences.

Analysis is a crucial step in the urban and architectural design process. It involves studying the city's structure (Zheng et al., 2025), breaking down urban space into its main components, and defining directions for development. This process is inherently linked to urban planning, which involves developing urban planning tools (Delavar et al., 2025).

The study area is served by several key roads:

- **NR 8:** This inter-urban axis connects Algiers to Boussaâda, passing through the Tablat Gorges and crossing the Wilaya of Bouira, including Sour-El-Ghozlane. It is economically significant for the region and city.
- **NR62:** Connects Sour-El-Ghozlane to M'hir (Wilaya of Bordj Bou Arreridj), passing through Bordj Okhriss to the east.
- **Bypass Road:** Constructed to alleviate traffic congestion in SEG and manage main vehicle flow, situated to the east.
- **PR 127:** Part of the inter-urban network, linking Sour-El-Ghozlane to the capital of Bouira via the commune of El Hachimia.
- **PR 20:** Connects Sour-El-Ghozlane to Berrouaghia to the west, passing through Dechmia. This two-lane road handles significant traffic and supports economic exchanges, notably with industries like industrial cement Groupe of Algeria & ENAD National Company for Detergents & Cleaning Products.
- **Bypass Road (repeated):** Mentioned again as part of the network designed to relieve congestion.

Suburban Network: Consists of roads ensuring connections between the city and secondary settlements and hamlets.

Roads, Facilities and Squares

Sour El Ghozlane faces significant challenges due to the increasing number of demolitions compared to conservation efforts. The municipality has not made sufficient interventions to protect this historic center; instead, proposals aim to replace the old center with new projects, such as housing and facilities.

Despite these challenges, several important facilities have been created in the old core of the city of Sour El Ghozlane. However, these facilities are often designed to serve the wider regional and national population rather than address the specific needs of the local population, resulting in intensive and diverse movements.

The city has expanded rapidly within the constraints of its fortified walls and is now divided into two main areas: the functional area to the south and the residential area to the north. Between these two areas lies a rectangular square that is both a public square and a green space, with the headquarters of the public administration at the western end (built in 1951) and the Ibn Badis School (formerly Victor Hugo, during the colonial period) at the eastern end (built in 1950).

The road network in Sour El Ghozlane is crucial for the city's image and morphology, categorizing the streets into three types: the primary network, which includes major roads like R.N.8, growth axes, and boulevards; the secondary network, consisting of less important roads that connect various areas; and the tertiary network, which includes alleys, lanes, and urban passages serving residential neighborhoods. Key streets in the city include **Mazani Mokhtar Street**, a central road extending from Bab Boussaâda to Bab Al-Jazair, which experiences heavy traffic and congestion, particularly at intersections. **Boulevard Emir Abd El Khader** is a historic road that connects the north to the south, accommodating commercial establishments and other facilities. **Boulevard 1st November** marks the boundary between the colonial fabric and the western extension, supporting institutional facilities and significant urban points. Road **Ghomari Slimane** and Road **Hamiche Menade** serve as key transverse east-west structuring streets. Squares have lengthy been essential city spaces, evolving from historical Greece and Rome via the Renaissance and Baroque durations, serving diverse public functions (Morris, 2013)**.** In the study area, tremendous squares include Independence place, the town's administrative hub

with a mosque, Berriche place, linking military and civilian areas, and Place of Marché, a business area connecting administrative and residential zones. Square of El Attique Mosque marks the transition from colonial to northern growth regions, while Place of Armes, as soon as an army web page, now hosts public activities.

Historical contents: gates, walls, equipment

Between 1846 and 1862, a fortification wall (Figure 2) was constructed around the city, approximately 6.7 km long and built using dressed stone. The Roman-inspired wall included 17 bastions and loopholes (Figure 3), serving as a protective structure for the old Ksar.

- Gates: The wall included five gates that connected the city with the surrounding areas:
- Northern Gate (Porte d'Alger): Completed in 1855.
- Southern Gate (Porte de Boussaâda): Completed in 1856.
- Eastern Gate (Porte de Sétif): Completed in 1857.
- Western Gate (Porte de Médéa).
- Fifth Gate: A smaller gate located behind the hospital, linking to surrounding neighborhoods.

The fortifications around the city included various military equipment, such as watchtowers, bastions, and loopholes for defensive purposes. These structures were essential for controlling access to the city and defending it from external threats. (Figure 4) below illustrates roads, facilities and historical contents of the historical center.



Figure 2. The wall of Sour El Ghozlane (Source: Authors, 2024)



Figure 3. The height of the wall
of Sour El Ghozlane (Source: Authors, 2024)

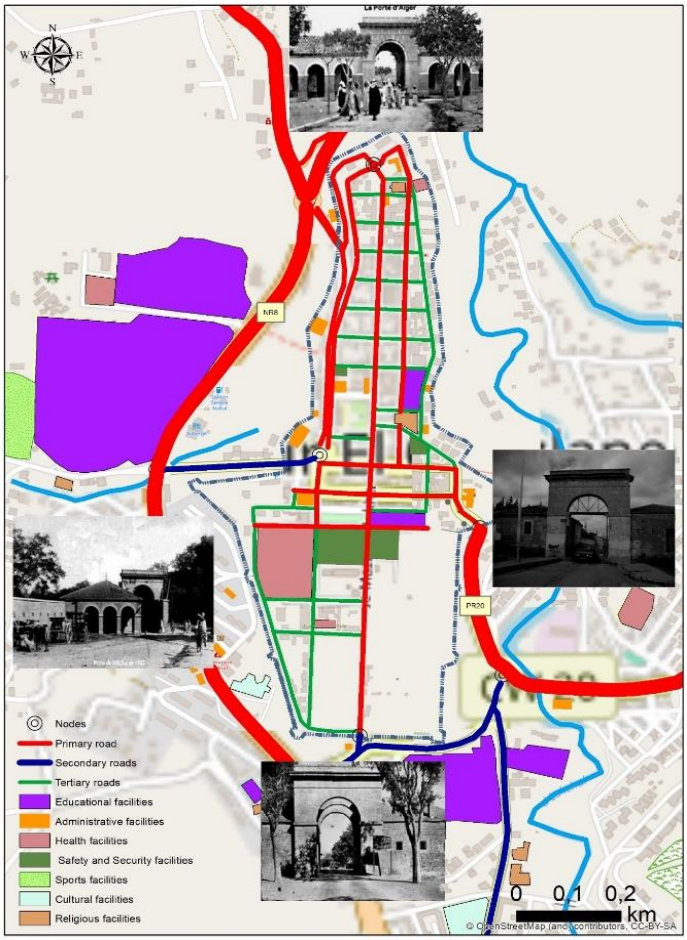


Figure 4. Roads, facilities and historical contents
of the Historical Center (Source: (Monograph, 2025)

RESULTS AND DISCUSSION

Breakdown of the study area into zones

Objective of the Survey: The O/D survey aims to understand movement habits of individuals within the study area by evaluating key characteristics such as: The origin and destination of trips; The purpose of trips; The quality of service.

Execution of the Survey: The O/D survey involves interviewing a sample of passengers using buses, taxis, and other modes of transport at major stops in Sour El Ghozlane. Participants are asked detailed questions to gather representative data. The study area is segmented into different zones for detailed analysis:

- Internal Zones: Representing neighborhoods within the city.
- Adjacent Communes: Covering nearby municipalities.
- Other Communes in the Wilaya of Bouira: Including other communes within the Wilaya.

- Other Wilayas: Covering regions outside the Wilaya of Bouira. This segmentation helps in locating and explaining the structure of trips (origins and destinations) of transport users recorded during the surveys.

Organization of public transport in the study area (field study)

The field study used a questionnaire distributed to a random sample of travelers across urban lines. Results were analyzed using SPSS Transportation modes and passenger numbers vary within the city and between surrounding municipalities (Figure 5).

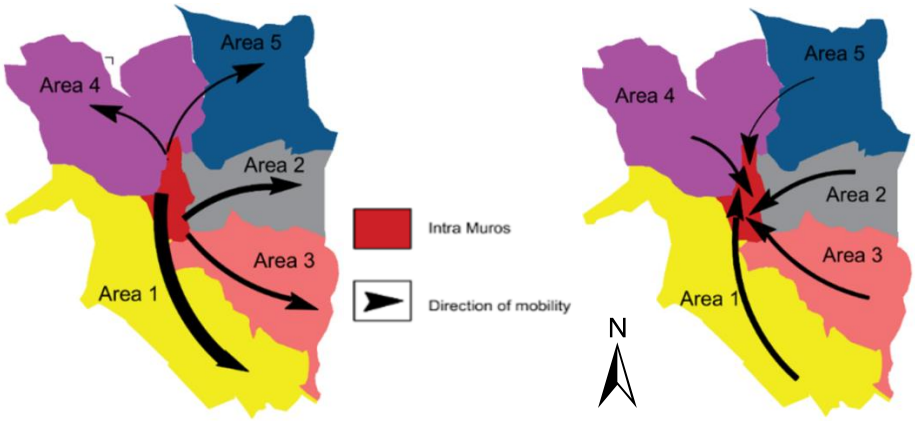


Figure 5. Means of transportation and numbers of passengers within the city and between surrounding municipalities

Observations from the Survey

- "Capsule" Buses: Common in the area, with the largest number of passengers using the line between the city center and Ain Amor (Area 1). This line benefits from a bus station in Ain Amor.
- City Center to Neighborhoods:
  - Area 2: Connects with the city center, where administrative facilities are concentrated.
  - El Djebsa (Area 3): Has a significant passenger flow, with buses filling up every 5 minutes.
  - City Center to Haouch EL Wassfan (Area 4): Serviced by around 34 buses, though not all operate daily. Buses fill up in about 20 minutes, with an average of 3 buses per hour.
- Transportation to Neighboring Municipalities:
  - AinBessam and BirGbalou: Key lines for residents due to the area's agricultural and trade importance. Taxis are available every 20 minutes for shopping and medical treatment.
  - Bordj Khriss: Although administratively independent since 2000, it maintains strong familial and historical ties with Sour El Ghozlane.
- Western and Eastern Sides:
  - Western Destinations: Few buses or taxis to Jawab, Dechmia, and Maamora, leading to unauthorized transit options.
  - Eastern Side (Hakimia): Similar issues with unauthorized transportation.

Regional Connections:

- Bouira: 90% of the population's movements before 6 a.m. are towards the capital, with the remainder divided among work, study, medical exams, or shopping.
- Sidi Issa (Wilaya of M'sila): Most trips are aimed at reaching this Wilaya, particularly for students at the University of M'sila.
- SEG - El Harrach: This line sees over ten taxis departing before 6 a.m. due to historical connections and commuting needs.
- SEG - Larbaa: Commuters face difficulties due to the station's distance from other transportation modes (Table 1).

Table 1. The destinations and the means of transport used (Source: Field survey 2024)

Means of transport	Destination	Nº of Departing Passenger	Nº of Arriving Passenger
TAXI	HARACH	140	70
	AI BESSAM +BIR GHBALOU	378	280
	BOREDJ KHRISS	75	126
	Dechmia	69	61
	Mammoura	55	42
Total		**717**	**579**
BUS	Bouira	696	464
	Sidi Aissa	725	435
	Larbaa	453	230
total		**1874**	**1129**
CAPSULES	Ain amor	648	324
	Amara belkcem	342	216
	Djebsa	270	195
	Draa lahmr	134	189
	Takwin	68	95
Total		**1462**	**1019**
		Total 1= 4053 Passenger	**Total 2 = 2727 Passenger**
Total Departing and Arriving passengers		**6780 Passenger**	

Analysis of the transport system

Passenger Traffic: Peak Hours: The bus station experiences high passenger volume, with 1,874 travelers during peak times. Of these, 1,129 are incoming passengers, indicating SEG's role as a major entry point for suburban traffic.

Urban Parking: Current Challenges: Urban parking faces significant economic, social, and technical challenges, impacting the city's functionality. Parking issues are not adequately addressed, suggesting a need for improved management and organizational strategies.

Road Infrastructure and Mobility:

- Supply and Demand Alignment: The road infrastructure is under strain, requiring a better alignment between mobility supply and demand. The concept of "mobility," which emerged in the 1920s, involves changes in spatial position and social dynamics, reflecting broader social changes.
- Saturation and Modal Shift: The saturation of the road network calls for immediate action. There is a recognized need to shift towards public transportation and soft mobility options to alleviate congestion and improve urban functionality.

Urban Traffic Plan: Strategic Planning: According to the Algerian national center for urban studies and research, to tackle these issues, the urban traffic plan aims to organize travel and manage traffic flows on a regional scale within SEG. This plan is aligned with urban planning and strategic documents, including the PDAU and the POS.

Modalities of the Concept of Mobility

➢ Mobility as a Socio-Spatial Phenomenon

- Dual Capacity: This modality recognizes mobility as having two intertwined dimensions:

o Physical Movement: The ability to change locations.

o Transformative Capacity: The potential to adapt, change status, or gain new skills.

- Interconnected Dimensions: Both dimensions are critical, as physical movement often leads to or accompanies personal and social transformation.

➢ Mobility as an Analytical Indicator

- Social Dynamics Insight: Mobility can be used to analyze and understand social realities:

o Family Relationships: Measuring mobility can reveal patterns in family interactions, such as who travels the most or least and how often family meetings occur.

o Work-Life Balance: It helps assess pressures faced by individuals, such as working parents balancing their professional and personal lives.

➢ Mobility as a Social Norm

- Fundamental Right: Mobility is recognized as a fundamental human right, as stated in Article 13 of the Universal Declaration of Human Rights, which ensures freedom of movement.
- Social Norm in Western Societies: In modern contexts, mobility is often seen as a social norm:

o Rapid and Long-Distance Travel: This form of mobility is associated with personal freedom and the ability to establish contacts without spatial or temporal limitations.

o Democratization of Mobility: The ideal of reversible mobility, where individuals can easily move and connect with others, reflects broader societal values.

Analysis of the sample's demographic data

A total of 6,780 passengers were interviewed during this survey. (Table 2) shows the age and the situation of interviewed passengers, because, mobility services in future should be better oriented to the needs of the large customer groups of active elderly people and families (Stark & Gebhardt, 2025).

Table 2. Number of passengers, by age group, social and professional category (Source: Field survey 2024)

Age Group	Student	Government Employee	Housewife	Retiree	Unemployed	Other	Total	%
18 to 25 years	3.160	440	67	0	306	34	4,007	59.00%
26 to 40 years	0	170	1.120	66	33	0	1.389	20.50%
41 to 60 years	0	270	474	271	0	0	1.015	15.00%
61 and above	0	0	64	305	0	0	369	5.50%
Total	**3.330**	**1.830**	**671**	**576**	**339**	**34**	**6.780**	**100.00%**
%	**49.00%**	**27.00%**	**10.00%**	**8.50%**	**5.00%**	**0.50%**	**100%**	

Descriptive analysis of transportation means and mobility reasons

In analyzing the transportation system within the study area, the data reveals several significant insights. The bus is the most commonly used mode of transport, accounting for 48.50% of travel, followed by taxis at 36.50%, and private vehicles at 13.50%. The primary reasons for using various transportation modes include the need for proximity (28.6%), cost considerations (23.5%), and the lack of alternative options (48%). Speed is prioritized by 22% of travelers, while safety is the least cited reason, influencing only 1% of users. In terms of usage frequency, a substantial 87.5% of travelers use transportation several times a week, with 24% using it daily.

Travel times vary, with the majority of journeys taking between 30 minutes and 1 hour. However, 22.5% of trips last between 15 and 30 minutes, and 21.5% exceed 1 hour, and finally we have 12.5% of the passengers surveyed, whose daily trip lasts less than 15 minutes (Figure 6). These patterns underscore the critical role of proximity and cost in transportation choices and highlight the need for improvements in reliability and alternative transport options to address the high percentage of users who have no choice but to use available services (Stępnicka et al., 2025).

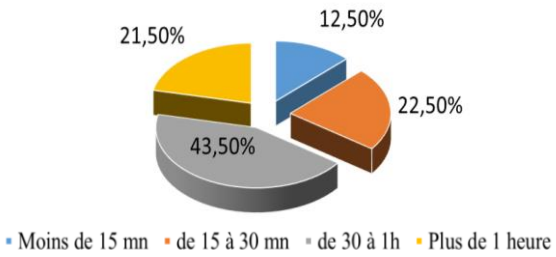


Figure 6. The time required for each journey

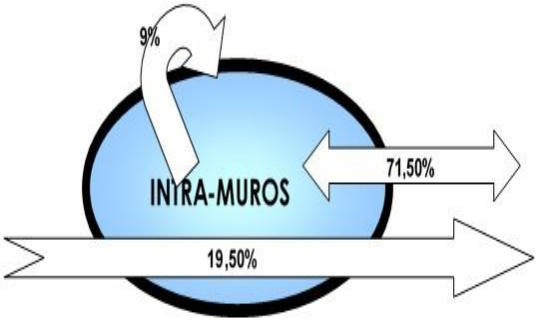


Figure 7. Characteristics of passenger traffic

Characteristics of travel

➢ Reasons for Daily Travel: The analysis of daily travel characteristics reveals several key patterns and trends. Home emerges as the most common origin and destination for travel, with 4.896 travelers starting from home and 1.292 ending their journeys there. This suggests that home is a central hub for travel activity.

Study-related travel ranks second, with 748 travelers beginning their trips for educational purposes and 1.700 ending at educational destinations. Work-related travel is third, with 646 travelers starting from and 1.462 ending at work locations, highlighting the significant role of employment in daily travel

➢ Characteristics of Passenger Traffic: The characteristics of passenger traffic further illuminate travel behaviors. Exchange traffic, where travelers switch from one mode or road to another.

Constitutes the majority, representing 71.50% of the total traffic. Transit traffic, which involves travelers passing through the study area without stopping, accounts for 19.50%. Loop traffic, involving travelers who return to their starting point, makes up 9% of the total (Figure 7). These figures underscore the importance of efficient interchange and transit systems in managing passenger flow and optimizing travel efficiency within the area.

Urban transport and mobility

Historically, urban regulations aimed to widen roads to accommodate vehicles and pedestrians better. In ancient Rome (William, 2010), roads were designed with a width of 12 meters, and during the day, car and freight circulation was prohibited to prioritize pedestrians and horsemen. As cities expanded beyond their walls, new suburbs and hamlets emerged, leading to the development of wider, straighter streets in newly built areas.

In Sour El Ghozlane, the city's vast expanse, with new facilities located outside the old walls, necessitates extensive travel for residents. This has led to a progressive dynamic in the city that requires immediate attention from urban planning professionals to improve transport infrastructure and alleviate congestion (Liu et al., 2025).

Space allocation and urban planning

Urban planning in Sour El Ghozlane follows distinct principles for space allocation:

- **Western Part:** Reserved for health-related activities, including an expanded hospital, a paramedical school, and related housing.
- **Central Part:** Dedicated to public facilities to preserve the city's central axis.
- **Eastern Part:** Allocated for university and commercial activities, linking academic and public spaces effectively.

Public squares and green spaces

- **Place d'Armes:** This historic site, once surrounded by Aumale's rampart and superimposed on the Roman wall, has evolved significantly. Initially home to Victor Hugo primary school and Isly garden, it served military purposes until 1990. Recent developments have preserved parts of this historical site while transforming the area into a vibrant public space.
- **Pedestrian Axis:** A newly developed pedestrian path connects the historical Place d'Armes with modern amenities, including the youth center, garden, museum, mosque, and paramedical school. This path creates a historical discovery promenade, integrating the city's rich history with contemporary urban planning.

These initiatives are designed to enhance connectivity, address the city's transport deficiencies, and integrate historical and modern elements into Sour El Ghozlane's urban fabric.

Recommendations

The analysis presented is based on comprehensive field visits, surveys among public transport users, and traffic counts at key intersections in Sour El Ghozlane. This data has been pivotal in developing a robust database to evaluate demand and network utilization.

Proposals for an efficient road network and traffic management:

1. Structuring the Road Network: To moderate traffic congestion in Sour El Ghozlane, it is necessary to develop key roads and build bypasses around the city center. This would help to regulate traffic near historical places while yet allowing for natural traffic flow. A bypass will help to improve air quality, reduce noise, and ensure safer passage for both pedestrians and vehicles. Classify and optimize the road network: Roads will be classified on a more strategic functional manner into primary, secondary, and tertiary types, with specific design features applicable to each category, the primary roads should cater to

motorized traffic, providing enhanced signage, wider lanes, and segregated roads for buses and trams. Local accessibility is to be made available on a secondary road by prioritizing pedestrian routes providing for cycle lanes on tertiary roads (Sachar, 2025). This will help in urban mobility developments as it would ease movement both for drivers and pedestrians.

2. Expand and Modernize Public Transport: It is important to enhance bus and tram roads beyond towns like Gueltat Zergua to reach adjoining villages. Electric (Budnitz et al., 2025) or hybrid buses can help lessen environmental pollution and might increase system efficiency. This network expansion should be complemented by an on-demand shuttle service with better last-mile connectivity in the areas that need it, so that they may have better flexibility during off-peak hours. Establish BRT and Integration of Transport Modes.

3. In order to provide more efficient urban mobility, it is necessary to introduce a BRT system with dedicated lanes that would offer quicker and more reliable service. The system shall be well integrated with trams and buses with easy transfers between modes. This is aimed at providing better and quicker bus services on dedicated roads with priority lanes to ease congestion and provide a more dependable service for commuters.

4. Smart mobility solutions: Intelligent Traffic Management: Use of intelligent traffic management systems working based on real-time data in radar mode in dynamic modifications of traffic lights will help enhancing traffic flow, reducing congestion, and emissions. Upon the integration of sensors, smart traffic lights would open up space for prioritizing movements of public transport and emergency vehicles to support the complete urban mobility network (Labri & Baziz, 2022). Mobility as a Service: The urban ONE platform aims to integrate all forms of transport, including buses, trams, bike-sharing, and car-sharing, into one application. Residents and visitors can plan their journeys, book a vehicle, and pay through one single application. MaaS makes the public transport system easier to understand and that much more attractive to tourists and newcomers.

5. Sustainable Transport and Green Mobility: Encourage Cycling and Walking: Expand cycling infrastructure by adding dedicated lanes to major roads (Alkhatib et al., 2022). Set up a public bike-sharing system. An expansion of pedestrian-friendly zones and a network of walking paths, particularly in historic areas like intra-muros, pushes people to walk or cycle instead of opting to go by car. Less traffic and improvement to the environmental footprint of the city will result. Urban Green Spaces and Green Corridors: Integrate green spaces with urban transportation. These open spaces should become the nodes that actually connect to different modes of travel, such as biking or even pedestrian routes. Green corridors can be created on the roads, so transportation can improve air quality, reduce heat islands, developing an amiable and sustainable environment for all.

6. Heritage and tourist sites Preservation and Smart Design Integration: The historical and tourist character of Sour El Ghozlane needs to be conserved, and at the same time, modern solutions must be integrated in urban development. With the usage of smart technologies Integrating Sustainability into Heritage Sites: Install modern sustainability features like solar panels, efficient systems, and climate control technologies in historical buildings. These would allow the preservation of cultural heritage while ensuring that the city operates smoothly and adheres to modern energy-efficient standards.

7. Policy and Governance: Implement Sustainable Mobility Policies: Local authorities should adopt policies that promote public transportation, the use of bicycles, and walking. These policies could establish financial incentives for the usage of eco-friendly transport, stricter regulatory emissions on vehicles, and subsidies for public transport. Such incentives would reduce dependence on private cars while lowering pollution levels (Jiao et al., 2025). Stakeholder Engagement: Public engagement is necessary in the creation of systems of transport that serve all citizens. Urban planners should be brought into consultation with residents and local businesses, allowing for strategies to be worked out in light of broader community interests. This would ensure that the public transport system is accessible and satisfies the needs of local residents and visitors.

8. Long-Term Vision: Railway Connectivity: Sour El Ghozlane's strategic position in Bouira wilaya, combined with its historical importance, underscores the need for modern transport infrastructure to support regional development. The long-awaited railway connection to Bouira and Constantine is expected to boost regional prosperity and facilitate commerce.Regional Mobility Hub: Sour El Ghozlane can become a regional mobility hub, connecting different transport modes (train, bus, tram, bicycle-sharing). This mobility hub could also include logistics centers for regional commerce, enhancing Sour El Ghozlane 's role in facilitating trade and economic (Alves et al., 2023).

CONCLUSION

Finally, we can say that Sour El Ghozlane is a historical and tourist city par excellence, and it must be preserved in light of the development of modern means of transportation. Therefore, there is a need to develop smart mobility solutions that contribute to the integration between traditional transport infrastructure, green spaces, and urban development to improve mobility, reduce congestion, and promote sustainable development. These will need active cooperation from local authorities, urban planners, and the community for effective implementation.

If this recommendation is adopted, Sour El Ghozlane can be assured of its growth in modernity without affecting its rich historical heritage, this heritage site, therefore, has great tourist potential that could be used to foster local development in an effective manner. Thus, this attracts visitors, offering opportunities, not only for economic growth, but also for job creation and the preservation of cultural landmarks, enabling sustainable tourism and the safeguarding of traditions. The cultural heritage and tourism development are necessary for sustainability, since social and economic growth are acknowledged as unfolding beneath the built environment or heritage (Yiamjanya, 2024).

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curation, O.C. and M.C.; writing - original draft preparation, O.C. and M.C.; writing - review and editing, O.C. and C.M.; visualization, O.C. and M.C.; supervision, M.Z.; project administration, O.C. All authors have read and agreed to the published version of the manuscript.

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GEOTRAILS: BLENDING GEOTOURISM AND GEOLOGICAL DISCOVERY AT THE BAYAH DOME GEOPARK, INDONESIA

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Abstract: Lebak Regency in Indonesia is endowed with abundant geotourism potential spread across several regions, including beaches, waterfalls, hot springs, caves, and panoramic landscapes. The Bayah Dome Geopark is distinguished by its remarkable geological importance and significant potential for geotourism development. However, the development of its geotourism resources, particularly within the Bayah Dome Geopark, remains underdeveloped due to lack of infrastructure, integration of geo-sites and accessibility problems. These barriers affect tourism viability for local economies and restrict their socio-economic benefits. Addressing these issues, this study examines strategies to improve accessibility and geotourism trail development in the Bayah Dome Geopark, encompassing 15 sub-districts. The research employed a combination of primary and secondary data collection, including literature reviews, field observations, interviews with stakeholders, and geosite mapping. Secondary data was obtained by a comprehensive literature examination of geological reports, tourism studies, and regional development plans. Furthermore, geospatial analysis, encompassing geosite mapping and cluster analysis, was performed to enhance spatial planning and resource distribution. Cluster analysis was utilized to group geosites and tourist attractions based on geological, biological, and cultural diversity, enabling the creation of thematic geotrails. These trails were designed to optimize visitor experiences while minimizing environmental impact, considering accessibility, travel distances, and supporting infrastructure.The findings reveal that the Bayah Dome Geopark has 74 geotourism attractions, categorized into 60 geological, 5 biological, and 12 cultural sites. These were clustered into six major themes and corresponding sub-themes, such as Coastal Scenic Scape and Goldmine Heritage, which offer diverse tourism experiences. The development of geotrails as "natural geological laboratories" not only fosters educational opportunities but also promotes environmental conservation and cultural preservation. The implications of this study are significant for geotourism development globally. The thematic geotrail framework offers a replicable model for other geoparks, demonstrating how clustering and mapping can transform scattered geosites into cohesive and engaging tourism networks.

Keywords: accessibility, geotrail, geotourism, geosites, thematic trails, Geopark Bayah Dome

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INTRODUCTION

According to the United Nations (UNESCO), a Geopark is an area with clearly defined boundaries and a surface area large enough for local economic development. Geoparks comprise a number of sites of geological diversity of special scientific interest, rarity and beauty known as geological heritage (Duangkrayom et al., 2022; Zangmo Tefogoum et al., 2022). Geoparks relate not only to geological diversity but also to archaeological, ecological, historical or cultural values . Based on Presidential Regulation No. 9 of 2019 concerning the Development of Geopark, Geopark is a single or combined geographic area, which has Geological Heritage Sites (Geosite) and valuable landscapes, related to aspects of Geoheritage, Geological Diversity, Biodiversity, and Cultural Diversity and managed for the purposes of conservation, education, and sustainable economic development of the community with the active involvement of the community and local government (Chen et al., 2022; Newsome & Ladd, 2022). Therefore, it can be used to foster people's understanding and concern for the Earth and the surrounding environment. Currently, the development of geoparks in Indonesia has been quite massive in recent years (Ginting et al., 2021; Rosyidie et al., 2018; Zaenal et al., 2016), especially related to geotourism, which is also increasingly popular among tourists today (Antić et al., 2022).

Geotourism has arisen as a sustainable tourism strategy that harmonizes environmental conservation with socio-economic advantages (Williams et al., 2024). It emphasizes the judicious utilization of natural resources, advancing the

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dual objectives of education and conservation (Dowling, 2023). International studies underscore the need of incorporating accessibility and conservation within geotourism frameworks, especially in topographically demanding regions such as rural Geoparks (Berred et al., 2022; Morante-Carballo et al., 2023). Geotourism development is a prominent topic not only in Indonesia but also in many global locations (Chen et al., 2022).

The endorsement of Geopark development by UNESCO has motivated each nation to safeguard its Geopark initiatives (Guimarães et al., 2018; Németh & Gravis, 2022), as these efforts not only focus on environmental preservation but also on education and the socio-economic enhancement of the populace (Pásková & Zelenka, 2018; Suzuki & Takagi, 2018). At now, geotourism has emerged as an alternative tourism management approach centred on the secure and sustainable utilisation of natural resources, which is widely recognised in Indonesia. This is inextricably linked to Indonesia's abundant geological history, characterised by a distinctive and intricate geological and geomorphological structure.

The advancement of geotourism within sustainable tourism has emerged as a novel impetus for conservation initiatives while enhancing the well-being of local populations. Geotourism is a viable solution to the genuine contradiction between environmental and cultural preservation and economic development (Williams et al., 2024). Abou Arrage & Chamra (2022) indicated that geotourism has expanded markedly across all continents in the last two decades, generating a substantial demand for innovative and systematic methodologies to identify sites of geological significance and establish a comprehensive management framework. Current geotourism research predominantly emphasise on improving accessibility or safeguarding environmental conservation (Bollati et al., 2024). Few have successfully integrated these two components into a unified framework that harmonises visitor accessibility with ecological conservation, especially in rural and topographically complex areas such as the Bayah Dome Geopark.

Accessibility in geotourism development is a crucial determinant of success. Many geosite areas lack sufficient access, hindering visitor attendance (Berred et al., 2022; Ketut Ari Pegatariana et al., 2024; Quesada-Valverde & Quesada-Román, 2023). However, it is imperative to exercise caution while constructing road access to the geosite to avoid harming the current ecology (Stolz & Megerle, 2022; Williams et al., 2025). Geotrails constitute a segment of the transportation network facilitating access between geosites. Visitors are typically driven to explore geotrails for five primary reasons: to seek entertainment, to acquire knowledge and discover new information, to engage in local activities, and to enjoy themselves (Ang et al., 2024; Stolz & Megerle, 2022). Geotrails have emerged as a contemporary trend in the 21st century, interlinking a sequence of geosites, natural, mining, and cultural attributes, so effectively connecting geo-themes on a broad scale (Bollati et al., 2024). Consequently, they can substantially augment and elevate the attractiveness of a region to the visiting populace (Lewis, 2020).

Geotrails provide various functions and advantages, including enhancing visitor experiences and safeguarding geosites from excessive utilization. The subsequent functions underscore their importance in geotourism: First, Geotrails function as "outdoor classrooms" or "natural geological laboratories," imparting knowledge to visitors regarding Earth's history, geological processes, and cultural legacy. Interpretative signs, guided tours, and digital platforms can augment the educational component by offering context on the sites and their importance (Dowling, 2023). Educational geotrails significantly enhance geoscience literacy, enabling tourists to value geological features and their environmental significance (Grobbelaar et al., 2019). Second, a primary role of geotrails is to reduce the ecological footprint of tourism. Geotrails restrict direct engagement with delicate geological formations, vegetation, and wildlife by directing visitors along specified routes. This mitigates prevalent problems such as soil erosion, littering, vandalism, and over-tourism. Effectively administered geotrails safeguard the natural integrity of geosites while permitting regulated access (Gordon et al., 2021). Third, geotrails facilitate access to isolated or dispersed geosites by connecting them via navigable pathways. These routes are frequently planned for several means of transportation, including walking, cycling, driving, or horseback riding (Bollati et al., 2024).

In regions with difficult topography, geotrails offer a systematic and safer method for tourists to navigate otherwise unreachable locations (Lewis, 2020). Forth, by aggregating and linking geosites into thematic trails, geotrails enhance the overall appeal of a location. Themes like “Coastal Scenic Scapes,” “Volcanic Landscapes,” and “Cultural Heritage Routes” generate compelling tales that attract tourists and promote extended visits. These themes enhance the tourism experience, rendering locations such as the Bayah Dome Geopark more competitive in the global tourism industry (Ginting et al., 2021).

The last, Geotrails facilitate local economic development by incorporating adjacent communities into tourism initiatives. In addition to the geosites, tourists may engage with local crafts, traditional foods, or cultural performances, so bolstering local enterprises and enhancing community pride (Doucek & Zelenka, 2018; Gray, 2019). This engagement guarantees the equitable distribution of tourism gains, hence enhancing the region's social sustainability (Antić et al., 2022).

Geotrails can be readily established along existing routes utilised by 4WD vehicles, cars, bicycles, pedestrians, and equestrians, which are conveniently linked to lodging and attractions while avoiding conflicts with land management and access concerns (Herrera-Franco et al., 2022). Moreover, the necessity of establishing routes between geosites may limit direct visitor access, consequently mitigating possible damage inflicted by visitors (Herrera-Franco et al., 2022; Williams et al., 2025). Human activities, such as tourism, can exert environmental, socio-cultural, and economic effects. A crucial element of geosite conservation is the management of both the site and its visitors (Gordon et al., 2021).

Geological sites are compromised due to excessive visitation, vandalism, graffiti, littering, pollution, sewage issues, and negligent visitors. Besides safeguarding geosites, geotrails can serve as appealing tourist attractions for visitors (Williams & McHenry, 2021). The concept of geotrails is acknowledged in geotourism, although their capacity to function as educational platforms and stimulate local economic development is inadequately explored in current research. Limited research has shown how geotrails can concurrently educate visitors and support local communities. To realize their potential, geotrails must integrate specific attributes that conform to geotourism principles such as integration with

established infrastructure, interpretation and signage, sustainability initiatives and scalability and replicability (Abou Arrage & Chamra, 2022; Morante-Carballo et al., 2023). However, the development of geotrails presents problems.

These encompass: topographical constraints, reconciling accessibility with conservation, and community involvement (Herrera-Franco et al., 2022; Williams & McHenry, 2021).

Lebak Regency is presently promoting the advancement of geotourism within the Bayah Dome Geopark, featuring approximately 156 tourist attractions. Lebak Regency, predominantly rural, faces difficulty in establishing a sufficient transit system. Rural regions characterised by mountainous terrain encounter significant challenges in delivering transit services and infrastructure. In contrast, tourism that has enough amenities and infrastructure can effectively attract visitors. Moreover, the presence of accessibility, supportive services, and infrastructure can foster sustainability and enhance competitiveness in tourism within a region. Consequently, research on the advancement of tourism accessibility is crucial for promoting the development of geosite support facilities and infrastructure. This research combines geotrail construction with an extensive evaluation of accessibility and infrastructure. It delineates transportation networks, geosites, and hubs while accounting for environmental constraints. The study proposes thematic geotrails that link geosites through sustainable paths, so reconciling accessibility with conservation and providing a reproducible model for additional geoparks. The main objective of this study is to improve tourism accessibility in the Bayah Dome Geopark by creating thematic geotrails that link geosites via sustainable routes. This study examines current infrastructure and transportation systems, identifies geosites and tourism centers, and considers environmental limitations. The study aims to establish a geotrail framework that integrates accessibility enhancements with conservation principles, thereby fostering geotourism development and providing a repeatable model for additional geoparks globally.

METHODS

This study employs descriptive research methodologies. The methodologies employed for primary and secondary data collecting included literature review, observation, interviews, and mapping. This study involved direct observations of the current conditions, including tourist destinations, road networks within the Bayah Dome Geopark Area, and access routes to geotourism. Furthermore, data collection through interviews targeted various authorised entities to obtain the requisite information, including the Lebak Regency Culture and Tourism Office, Lebak Regency Transportation Office, Lebak Regency Public Works and Spatial Planning Office, POKDARWIS (local tourism organisation), and the local community within the study area.

The acquired data will subsequently undergo examination through mapping of the locations of Geotourism attractions and their accompanying facilities. The findings from observations conducted on tourist sites will serve as the foundation for establishing priority tourism within the Bayah Dome Geopark. This study additionally superimposes maps (geosite, tourist attraction, and road network) to ascertain the configuration of geotourism routes. The geotourism attractions in Bayah Dome Geopark encompass not only geological features but also ecological and cultural elements that enhance geotourism activities. Geotourism attractions are distributed across 15 sub-districts within the Bayah Dome Geopark region. In total, the Bayah Dome Geopark encompasses 74 geosites, categorised into 60 geological, 5 biological, and 12 cultural attractions.

The research utilises cluster analysis to categorise 74 geosites and tourist attractions into six principal themes and sub-themes. This method facilitates the recognition of synergies between geosites, cultural landmarks, and ancillary infrastructure, thereby establishing a full geotrail network (Figure 1). This theme organisation will augment tourist experiences, mitigate overcrowding, and promote management efficiency (Herrero et al., 2017; Williams et al., 2025).

The concept can be implemented in other geoparks to offer a systematic framework for combining various attractions into cohesive, purpose-driven tourist experiences. The geotrail route assessment includes an analysis of transportation entry and exit points (HUB) to geotourism areas, evaluation of the current road network and future development plans for geotourism routes, distribution of geosites/geotourism as primary locations, identification of Sub HUBs as resting points based on travel distance and time, and clustering based on thematic identification of geotourism groups. This analysis includes a map overlay that displays the geosite location with the existing road access map. The study presents an innovative method for visualising and planning geotrail accessibility by superimposing maps of geosites, road networks, and transit hubs. This approach guarantees that geotrails are both ecologically sustainable and physically accessible, especially in rural and topographically difficult regions.

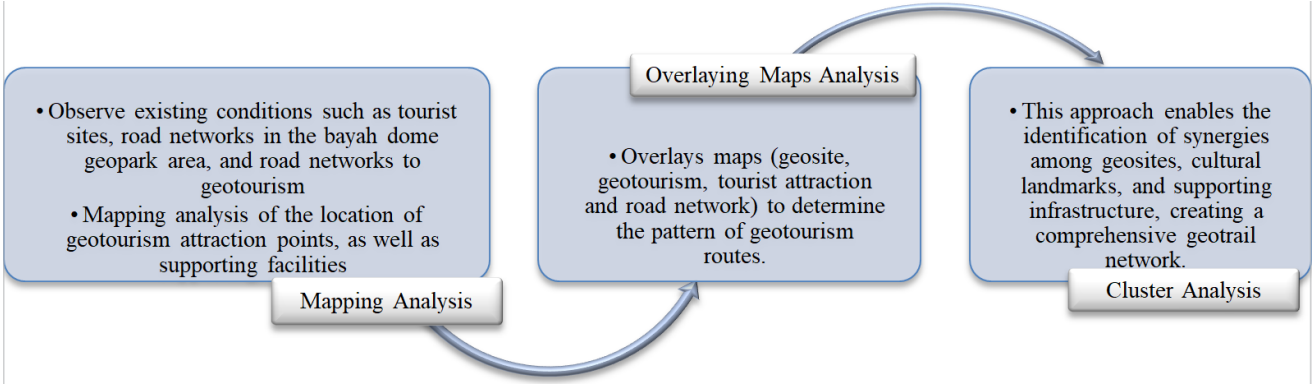


Figure 1. Stage of Analysis

To facilitate the recommendation of the appropriate geotourism route in this region. This integrated mapping approach significantly contributes to geotourism research by addressing deficiencies in accessibility planning identified in prior studies. The Santa Elena research, for example examining geosites and routes (e.g., GtRAM) and assessing local reception capacity, with an emphasis on integration with socio-economic activities (Herrera-Franco et al., 2022). The Williams and McHenry (2021) research investigates the application of Least-Cost Path (LCP) analysis for optimizing geotrails in a post-mining environment. It integrates GIS modeling, Analytic Hierarchy Process (AHP), and field validation to develop geotrails that correspond to user requirements, environmental limitations, and geotourism best practices. Current geotourism research has not extensively utilised advanced approaches, such as cluster analysis, to categorise geosites into accessible and interesting thematic itineraries. This constrains the capacity to create geotrails that accommodate varied visitor interests while ensuring efficient site administration.This study, however, innovates by applying cluster analysis to develop thematic trails in rural geoparks and highlights the importance of community involvement and sustainable infrastructure development.

RESULTS AND DISCUSSION

Lebak Regency is a region in Indonesia rich in natural beauty and cultural diversity that supports the tourism sector, however its development remains suboptimal. The development of geoparks as new and protected tourist destinations must be accompanied by enhancements in accessibility to promote sustainability and ensure competitiveness in tourism for the future. The Bayah Dome Geopark size in Lebak Regency encompasses 15 sub-districts, spanning a total size of 197,853 hectares. The demarcation of the region, encompassing over fifty percent of the total sub-districts in Lebak Regency, is established based on the presence of Geoheritage, Geodiversity, Biodiversity, and Cultural Diversity of significant value, which are managed for conservation, educational, and sustainable community economic development purposes.

A. Analysis of Attraction and Geotourism Support Facilities

Tourist attractions may be categorised as either natural or artificial. Natural attractions include beaches, waterfalls, mountains, caves, and similar features. Man-made attractions including museums, parks, ponds, and similar sites. Lebak Regency is a region with numerous tourist attractions. According to the Lebak Regency Culture and Tourism Office, there are 124 tourist sites; however, only 23 are incorporated in the Lebak Regency Regional Spatial Plan within the Bayah Dome Geopark Area (Figure 2). Notwithstanding the region's geological wealth, chances for geotourism development have been neglected, resulting in its geoheritage remaining mostly unexploited for tourism. The Bayah Dome Geopark Area features not only natural attractions distributed among its sub-districts but also encompasses cultural, religious, and manmade tourism opportunities. The presence of the Baduy Tribe Tourism Village in Leuwidamar District, Lebak Regency exemplifies existing cultural tourism. Furthermore, Malingping District features religious tourism. The georoute or geotrail, which integrates natural and cultural assets, is purposefully crafted for geotourism and geoeducation, with the objective of promoting geoconservation in rural regions (Carrillo-Hernández et al., 2024). Nonetheless, its complete geotourism potential remains unexploited. The quantity of tours in the Bayah Dome Geopark necessitates the development of this location, particularly for accessibility, including road condition and transit options.

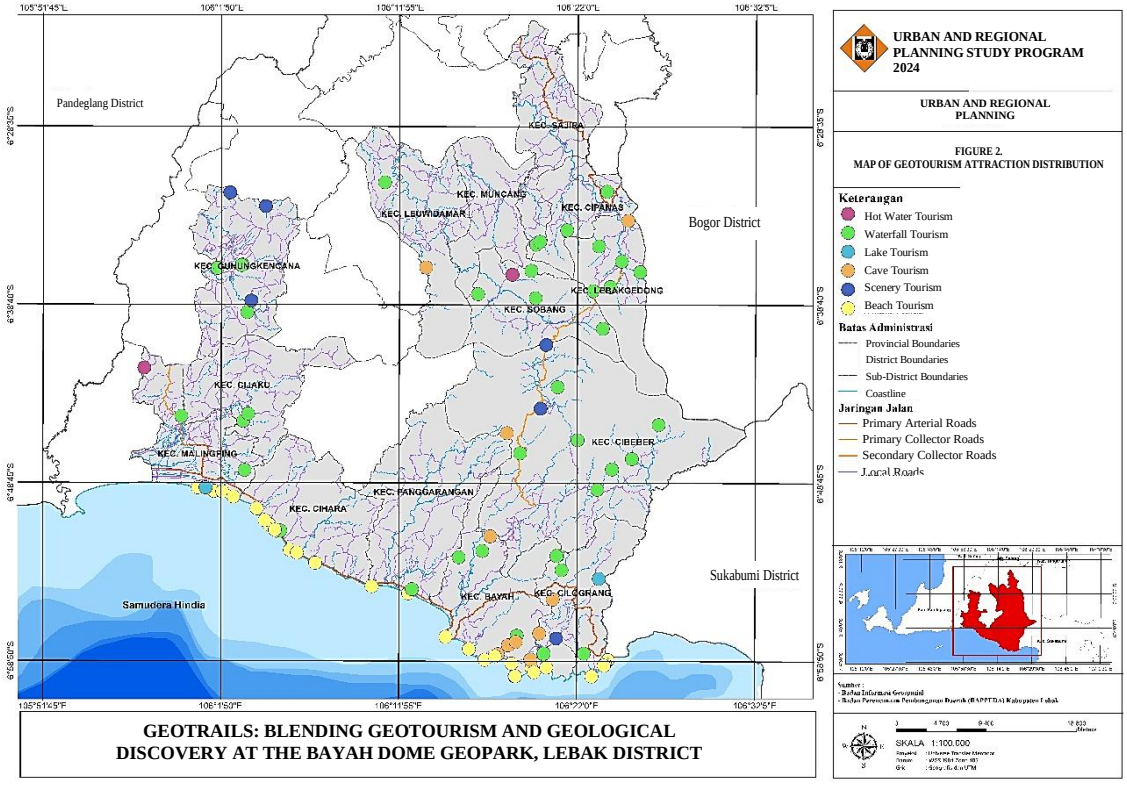


Figure 2. Map of geotourism attraction distribution (Source: Authors analysis, 2024)

Sawarna Beach, a renowned tourist destination in Lebak Regency, offers a coastal vista directly overlooking the Indian Ocean. Sawarna Beach is renowned for its white sand, towering surf, and many beaches featuring expansive coral formations. Sawarna Beach in the south features sufficiently large waves suitable for leisure activities, including surfing (Figure 3). Besides beaches, Bayah Dome Geopark offers mountain and scenery trips. The Negeri di Atas Awan tour, situated near Gunung Luhur, is a renowned mountain excursion within the Bayah Dome Geopark. The Negeri di Atas Awan trip is characterised by expansive natural vistas adorned with abundant white clouds. The Bayah Dome Geopark features waterfalls such as Curug Kadu Punah, Curug Munding, Curug Rame, among others. There are waterfalls, specifically the Citando hot springs, which emerge from behind the rocks around the spring, and the Tirta Lebak Buana hot spring situated in the Cipanas District. Lebak Regency features cave tourism, including Langir Cave, Seribu Candi Cave, and Lalay Cave, and others.



Figure 3. Geotourism Potential in Bayah Dome, Lebak Regency: a. Sawarna Beach features white sand and rather gentle waves b. Karang Taraje Sawarna Beach features sedimentary layers from ancient volcanic eruptions and coral formations resembling stairs c. The vista from Cikujang Peak encompasses Mount Anak Krakatau, which emerged in 1927, 43 years subsequent to the eruption of Mount Krakatau. d. Citorek Peak is situated in the mountainous region of Mount Luhur, offering breathtaking vistas of the sea of clouds (Source: Authors analysis; Lebak 2024)

Table 1 shows the number of visits, the Bayah *Dome Geopark* only has domestic tourists and there are no foreign tourists. In the Bayah *Dome Geopark* in 2023 there were 172,546 tourists who came to visit the existing tours. It can be seen from the table that several geosites has lesser, or no tourist since there is lack of access such as Sangiang Cave and Seupang Beach Tourism. Based on the data above, the majority of tourist visits are at the beach because of its easy access. Meanwhile, several points for caves and waterfalls still do not have good access. Apart from that, this data also shows that the majority of visitors are only local tourists.

Table 1. Number of Bayah Dome Geopark Tourists (Source: Culture and Tourism Office of Lebak Regency, 2023)

No.	Origin of Travelers	Destinations	Total	No.	Origin of Travelers	Destinations	Total
1	Local Tourist	Bagedur Beach	4,189	**11**	Local Tourist	Karang Bokor Beach	8,667
2	Local Tourist	Cibobos	1,777	**12**	Local Tourist	Karang Nawing	5,782
3	Local Tourist	Cipicung waterfall	593	**13**	Local Tourist	Cikujang Nature Panorama	525
4	Local Tourist	Ciporolak waterfall	450	**14**	Local Tourist	Cibareno Beach	7,198
5	Local Tourist	Munding waterfall	486	**15**	Local Tourist	Legon Pari Beach	10,919
6	Local Tourist	Sata waterfall	264	**16**	Local Tourist	Pulomanuk Beach	10,419
7	Local Tourist	Lake Talanca Beach	5,847	**17**	Local Tourist	Sawarna Beach	103,778
8	Local Tourist	Lalay Cave	15	**18**	Local Tourist	Seupang Beach	-
9	Local Tourist	Sangiang Cave	-	**19**	Local Tourist	Tirta Lebak Buana Hotspring	6,428
10	Local Tourist	Mount Luhur Citorek	5,208				
Total Tourist Visit 172,546							

B. Cluster and Path Analysis

Cluster analysis aims to group geoheritage objects and tourist objects that are agglomerated and become a consideration in determining tourist routes in one area so that it is easier to see the correlation from one object to another, where each object can be related to each other. This *clustering* can maximize the variation between clusters. Cluster analysis has been underutilized in geotourism research, with most studies emphasizing descriptive approaches to site identification. For example, Suzuki & Takagi (2018) focused on geosite evaluation but did not explore clustering methodologies to optimize visitor access and site management. This study's application of cluster analysis to group geosites into accessible and thematically cohesive routes represents a novel contribution, enabling better management of visitor flows and enhanced interpretive opportunities. *Clustering* in geosites and tourist attractions in the Bayah *Dome Geopark* Area can be seen in Figure 4.

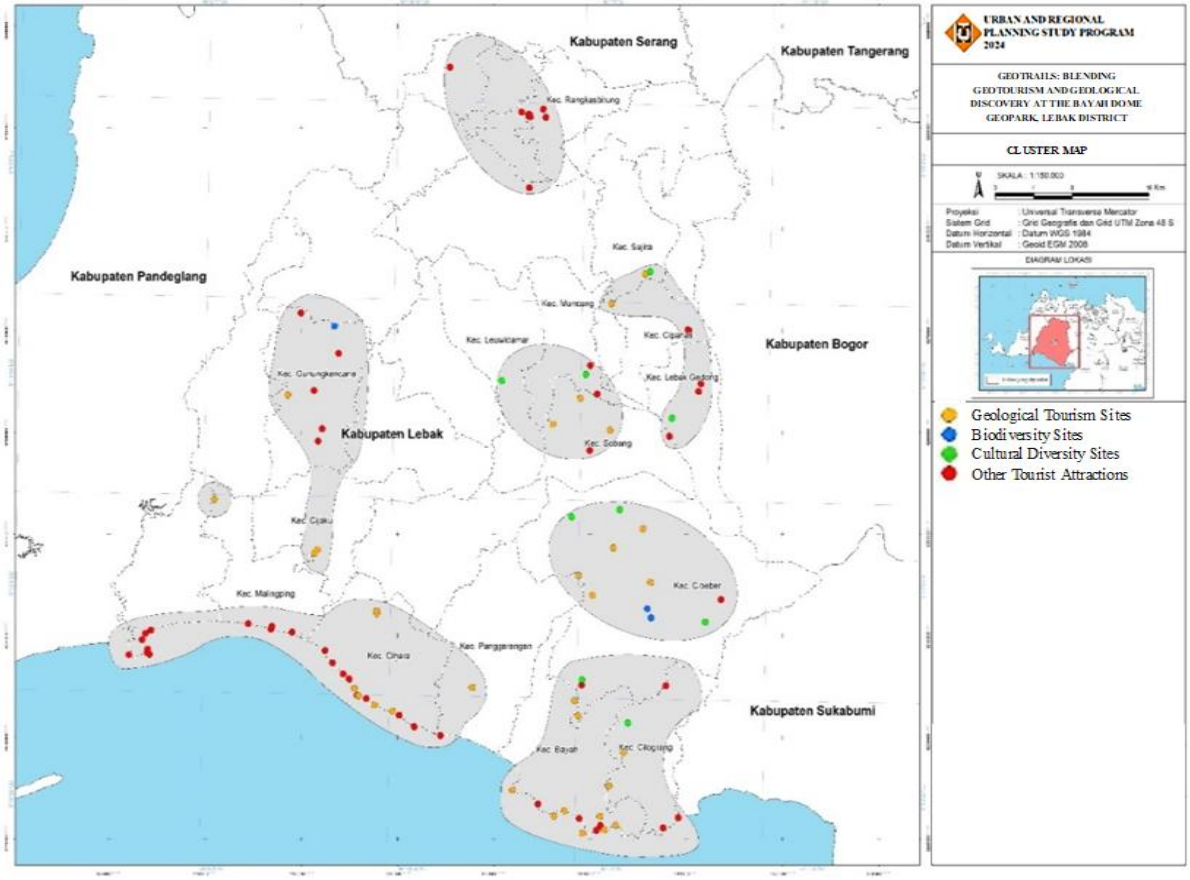


Figure 4. Cluster map (Source: Authors analysis, 2024)

During the clustering process, the initial category of geosite is determined, including geological, biological, cultural, and other tourism attractions in the region. The last phase involves establishing categories based on geographic closeness and accessibility. The analysis of tourism georoutes is conducted based on roadways that possess existing potential for development, facilitated by road classification and transportation infrastructure.

Table 2. Potential Roadways for Geotrail Access (Source: Authors Analysis, 2024)

	Status	Function	Length (km)	Description
1	National Road	Primary Collector 1	103,64	The connecting road between activity centers on the southern shore of Lebak serves as the sole access route, hence has the potential to function as a tourist pathway, particularly in this region abundant with tourist attractions and geosites. In the north, this national road serves as a vital access route to the Cipanas area, which boasts numerous attractions and geosites, so establishing its potential as a principal geotourism route.
2	Provincial Road	Primary Collector 2	156,39	The road linking to the southern region of Lebak is in relatively good condition and is frequently utilized by public transportation, including buses and local transit, to access the terminal in southern Lebak, indicating its clear potential as a tourist route.
3	District Road	Local Primary	157,83	This regency road serves as an access link between the Rangkas Bitung urban area and the southern region of Malimping. This route is typically utilized by public transit to the Malimping terminal and provides access to the Cihara-Bayah-Cilograng National Road. Its efficacy is notable due to the conditions and trip duration, indicating its potential as a tourism route. Furthermore, this road links the western and eastern regions of Lebak and serves as the primary route to Badui Village.
		Local Secondary	98,94	
4	Neighbourhood Road	Local Secondary	7,25	Local roads or village roads facilitate access to potential geotourism areas, with the expectation that these roads will enhance the accessibility of geotourism development.
			524,04	

This georoute examines the correlation between transportation infrastructure and tourist attractions distributed throughout the Bayah Dome Geopark Area. The accessibility of geosites is the primary criterion for selecting routes, taking into account the state of existing highways. There are four prospective routes and one designated development plan route available for geotourism. This prospective trajectory is illustrated in Figure 5 and Table 2 below.

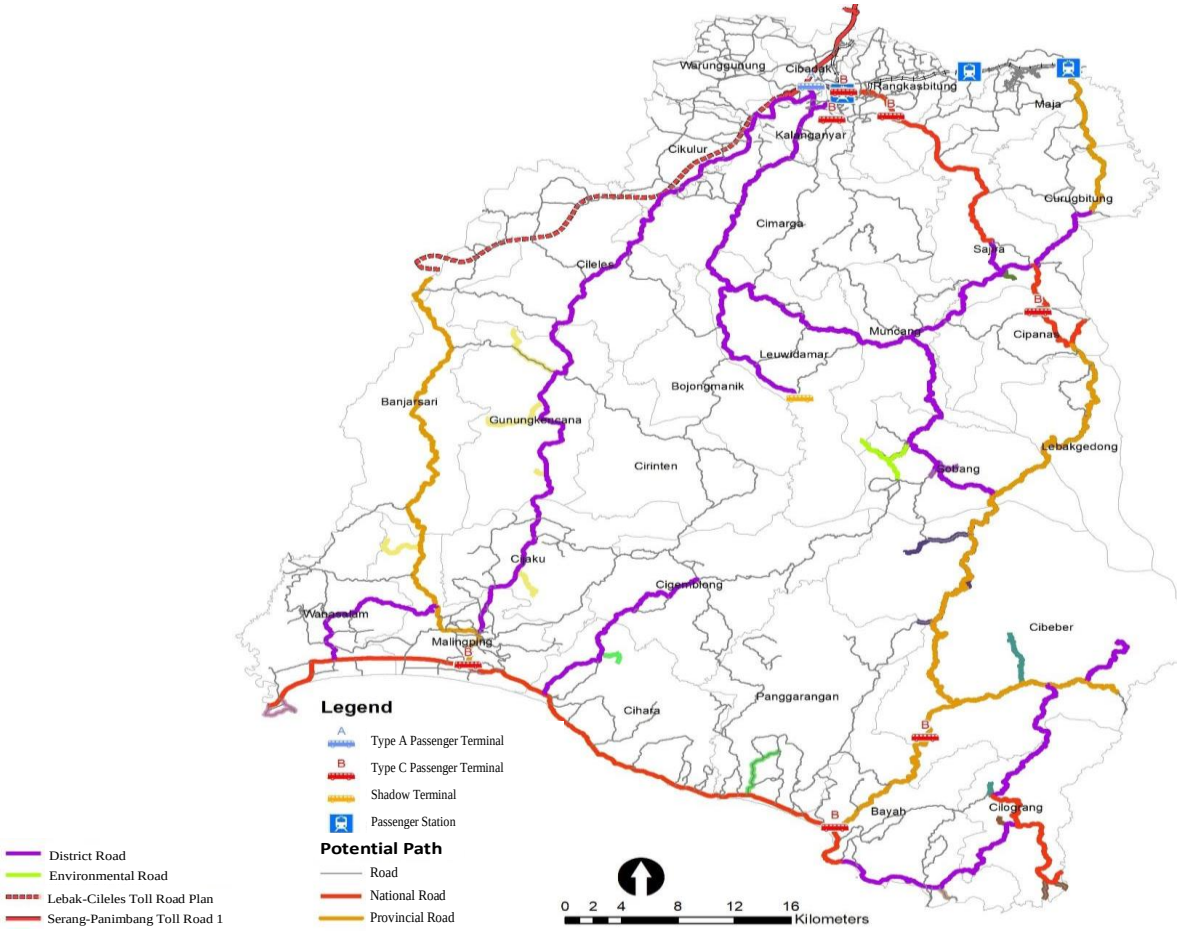


Figure 5. Road classification map (Source: Authors analysis, 2024)

In establishing this geotrail, it is essential to map the road network for accessibility, while also considering the location of the terminal that could serve as a HUB, along with other potential sub-hubs that may function as temporary stopping points for visitors to rest and obtain information about the geosite, as well as access and amenities related to their destination. Four roadways originate from Rangkasbitung City, which serves a HUB function, while both HUB and sub HUB are represented by terminals and stations, encompassing a toll road network that facilitates connectivity for tourists (Table 3). Subsequently, the HUB and Sub HUB will be outfitted with informational displays and transportation options for accessing geotourism. This georoute should ideally integrate all attractions, including geosites (geology, biology, culture, and social economy) and tourism sites, into a cohesive tourist path or route. This generates a multiplier effect from the construction of the Bayah Dome Geopark, including geoproducts, geotour guides, homestays, and more.

Table 3. Transportation Facilities to Connect Tourist Lines (Source: Authors Analysis, 2024)

Type	Hub/Sub Hub	Description
Maja Station	HUB	Maja Station that connects the regional road Jalan Maja-Koleang
Rangkasbitung Station and Mandala Terminal	HUB	Rangkasbitung Toll Gate, Rangkasbitung Station and Terminal, and Regional Road (Jalan Maja Raya)
Cileles Toll Road Plan	HUB	Cileles toll gate which is directly connected to the regional road Kaduangung-Cileles Road
Bayah Dome Geopark Information Center	HUB	Information center about Bayah Dome geopark as well as geotourism center in Lebak.
Citeras Station	Sub HUB	Connected to Maja and Rangkasbitung Stations, and connected to Cikande Rangkasbitung Highway on the border with Serang Regency.
Malingping Terminal	Sub HUB	Connecting Road Ps. Malingping and Jalan Simpang - Bayah
Bayah Terminal	Sub HUB	Connecting between Jalan Simpang - Bayah and Jalan Raya Bayah - Cikotok
Cikotok Terminal	Sub HUB	Connectors starting from the northern part, namely Terminal Rangkasbitung and the southern part, namely Terminal Bayah.
Cipanas Terminal	Sub HUB	Connected to Rangkasbitung Terminal
Ciboleger Terminal	Sub HUB	Connected to Rangkasbitung Terminal and Station, as well as Rangkasbitung Toll Gate
Rest area	Sub Hub	Locations that can be stops and rests and gathering points of geotourism

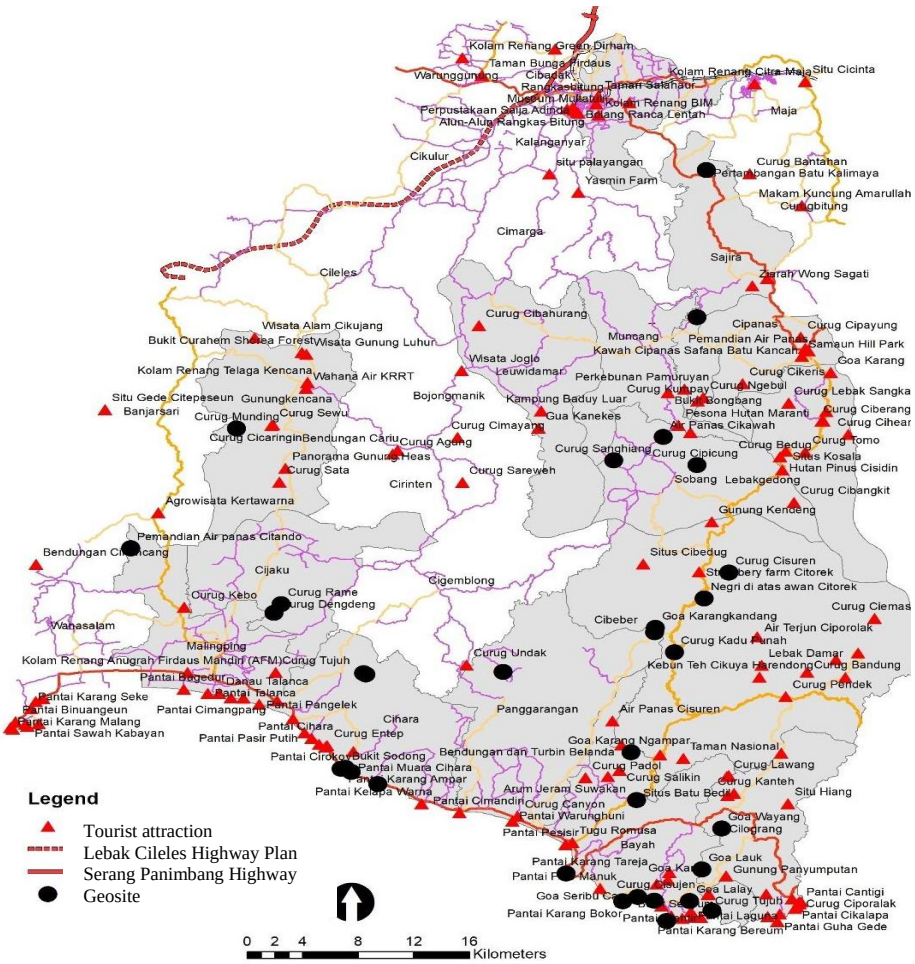


Figure 6. Map of geosites distribution and tourism objects in Geopark Bayah Dome, Lebak Regency (Source: Authors analysis, 2024)

Numerous geotourism studies concentrate on established or urban geoparks, neglecting the distinct issues faced by rural regions, including inadequate infrastructure, challenging topography, and insufficient public transportation networks. This study concentrates on the Bayah Dome Geopark, an area characterised by its agricultural nature and mountainous terrain. By evaluating current road networks, suggesting HUBs and sub-HUBs, and integrating local mobility options, it offers a scalable framework for addressing rural geotourism concerns. The distribution of sites and tourist attractions illustrated in Figure 6 indicates a concentration within a single area, which enhances its thematic appeal to visitors. The distribution presented will serve as important input for the subsequent grouping of areas to be discussed in Table 4.

Table 4. Geotourism trail themes and sub themes (Source: Authors analysis, 2024)

No.	Theme/Sub Theme	Geotourism Trail
A	**Coastal Scenic Scape**	
A.1	**Cihara Coral Bed** This sub-theme tells the story of the formation of millions of years of rock resulting from the melting of rocks on the beach and coral piles. The results of this formation create distinctive and unique shapes that can be used as a natural geological "laboratory".	▪ Information Center of Bayah Dome Geopark Center **(Infrastructure Site);** Bukit Curahem Shorea Forest **(Biological Site);** Malingping Ceu Bai Fish Baso **(Socio-Economic Site);** Malingping Terminal **(Infrastructure Site);** Bagedur Beach **(Nature Site);** Lake Mangrove Forest & Talanca Beach **(Biological Site);** Karang Nawing Beach **(Nature Site);** Karangmeja Beach **(Geological Site);** Karangampar Beach **(Nature Site);** Sodong Hill **(Geological Site);** Karang Songsong **(Geological Site);** Karangkamulyan Lignite **(Geological Site);** Kelapa Warna Beach (**Nature Site);** Cimandiri Beach **(Nature Site);** Bayah Terminal **(Infrastructure Site)**
A.2	**Tracing Ancient Delta Deposits** This sub-theme tells the story of the formation of rocks for millions of years as a result of melting rocks on the beach and piles of corals forming caves. The results of this formation create distinctive and unique shapes that can be used as a natural geological "laboratory".	▪ Bayah Terminal **(Infrastructure Site);** Karang Taraje Delta Deposits **(Geological Site);** Pulo Manuk Beach **(Nature Site);** Karang Bokor **(Geological Site)** ▪ Langir Cave Complex **(Geological Site);** *Geopark Product* Salequ Postharvest Ward **(Socio-Economic Site);** Ciantir Beach **(Nature Site);** Tanjung Layar **(Geological Site);** Legon Pari Beach (**Nature Site);** Turbidite deposits of Karang Taraje Sawarna **(Geological Site);** Seupang Beach (**Geological Site);** ▪ Tourism Information Center Sawarna **(Infrastructure Site)**
A.3	**Cilograng Karst Panorama** This sub-theme gives an overview of the formation of deltas and cliffs from the waves. The sensation of a typical cliffed beach atmosphere.	▪ Tourism Information Center Sawarna **(Infrastructure Site);** Lalay Cave **(Geological Site);** Lauk Cave **(Geological Site);** Cilograng MSME Gallery **(Socio-Economic Site);** Wayang Cave **(Geological Site);** Citarate Beach **(Nature Site);** ▪ Cibareno Beach **(Nature Site);** Cilograng Gunungbatu Gallery and Gazebo **(Infrastructure Site)**

B	**Science of Bayah Dome**	
B.1	**The Journey of Prabu Wong Sagati** The sub-theme that describes the upstream of the series of Bayah Dome formation by looking at the hills and beautiful hot springs.	▪ Bayah Dome *Geopark* Information Center or Maja Station **(Infrastructure Site)** ▪ Cadas Kudatuan (**Geological Site);** Wong Sagati Cemetery **(Cultural Site);** Samaun Hills Park **(Nature Site);** Tirta Lebak Buana **(Nature Site);** Cibolang Slope **(Socio-Economic Site);** Ciberang River Rafting **(Nature Site);** Kosala Site **(Cultural Site);** Kendeng Mountain Rest Area **(Infrastructure Site)**
B.2	**A journey through the land above the clouds** The main sub-theme of the Bayah Dome Geopark is because this sub-theme will provide an overview or story of the formation of the Bayah Dome which is the source of the story of this sub-theme.	▪ Kendeng Mountain Rest Area (**Infrastructure Site);** Kasepuhan Citorek **(Cultural Site);**Seren Taun Kasepuhan Citorek **(Intangible Site);** ▪ Cibedug Site (**Cultural Site);** Rest Area Citorek Tengah **(Infrastructure Site);** ▪ Curug Cisuren **(Geological Site);** Si Nyonya Goldfish **(Socio-Economic Site);** ▪ Awipis Cave Karang Kandang **(Geological Site);** ▪ Gunung Luhur **(Geological Site)**
B.3	**Uncovering Rocks from the Earth's Crust** This sub themes explained the geological evolution of this region has resulted in unique rock outcrops, some of which date back millions of years.	▪ Malingping Terminal **(Infrastructure Site);** Lake Mangrive Forest and Talanca Beach **(Biological Site);** Aci Kawung **(Socio-Economic Site);** Cihara Metamorphic Rocks **(Geological Site);** Cihara Granodiorite (**Geological Site);** Table Coral Beach (**Geological Site);** Karangampar Beach (**Nature Site);** ▪ Sodong Hill (**Geological Site)**
B.4	**Bayah Dome's "Central Belt" rural ambience** Sub-theme that describes the upstream of the series of Bayah Dome formation by looking at the formed waterfalls, hills, rocky rivers and beautiful sites.	▪ Bayah Dome *Geopark* Information Center **(Infrastructure Site);** Sempur Wood Fossils **(Geological Site);** Ranca Hideung Park (**Nature Site);** Meranti Customary Forest (**Biological Site);** Curug Cikawah (**Geological Site);** Hariang Gula Aren (**Socio-Economic Site);** Sanghiang Cave (**Geological Site);** Curug Cipicung (**Geological Site);** Kendeng Mountain Rest Area **(Infrastructure Site)**
C	***Goldmine Heritage***	
C.1	Traces of Indonesia's First Gold Mine A sub-theme that memorializes the oldest gold mine, the legacy of a private Dutch company, NV Mijnbouw Maatschappy Zuid Bantam, in 1839. Here this sub-theme if going to provide an experience back to the heyday of gold and other mineral materials	▪ Bayah Terminal **(Infrastructure Site);** Tugu Romusha **(Cultural Site);** Batu Bedil Site (**Geological Site);** Bantar Gadung Old Volcano Deposits **(Geological Site);** Cikotok Terminal (**Infrastructure Site);** ▪ Km 0 Antam Cikotok Gold Mine (**Cultural Site);** ▪ Cikotok Vein Access Crane/Hole (**Cultural Site);** ▪ Cirotan Mineralization Complex (**Geological Site);** ▪ Gunung Luhur (**Geological Site)**
D	**Eco-Culture of Indigenous People**	
D.1	**Baduy Cultural Saba** This sub-theme provides an experience of interacting with the life of the indigenous tribe of Lebak, namely Baduy, where this experience explores settlements with distinctive buildings, lifestyles and local wisdom that are still practiced today.	▪ Mandala Terminal/Rangkasbitung Station **(Infrastructure Site);** Aweh Terminal **(Infrastructure Site);** Cikapek Agrotourism (**Nature Site);** Baduy Traditional Village (**Cultural Site);** Baduy weaving (**Intangible Site);** ▪ Outer Baduy Forest (**Biological Site);** ▪ Eduwisata Kampung Landeuh (**Nature Site**); ▪ Multatuli Museum (**Cultural Site);** ▪ Bayah Dome Geopark Information Center (**Infrastructure Site)**
D.2	**"Kasepuhan" Forest Buffer Legacy** This sub-theme provides an experience to know the life of the Kasepuhan that still exist in Lebak, how to apply local wisdom that is unique to each Kasepuhan and an experience to learn about the community.	▪ Mandala Terminal/Rangkasbitung Station (**Infrastructure Site);** Kasepuhan Karang (**Cultural Site);** Meranti Customary Forest (**Biological Site);** Hariang Gula Aren (**Socio-Economic Site);** Kasepuhan Pasir Eurih (**Cultural Site);** Kasepuhan Citorek (**Cultural Site);** Si Nyonya Goldfish (**Socio-Economic Site);** Kasepuhan Cisungsang (**Cultural Site**); Cikuya Tea Garden (**Biological Site);** TNGHS (Lebak Damar) **(Biological Site);** Bayah Dome Geopark Information Center **(Infrastructure Site);**
E	***Urban Heritage* Rangkasbitung**	
E.1	**Rangkasbitung History Trail Room** Sub-themes that bring visitors back to the dimension of the colonial era, colonial building heritage, history of Multatuli and knowledge of the Bayah Dome Geopark.	▪ Mandala Terminal/Rangkasbitung Station **(Infastructure Site);** Former Oil Mill (**Cultural Site);** Water Torn Rangkasbitung (**Cultural Site);** Balong Ranca Lentah/Food Court of Rangkasbitung Square (**Socio-Economic Site);** Former Multatuli House **(Cultural Site);** Former Rangkasbitung Kewedanan House **(Cultural Site);** ▪ Multatuli Museum (**Cultural Site);** Rangkasbitung Square (**Infrastructure Site);** ▪ Imah Batik Sahate **(Socio-Economic Site);** ▪ Bayah Dome Geopark Information Center (**Infrastructure Site)**
E.2	**The beauty of religious tolerance in Rangkasbitung** This sub themes shows the story of home to various communities, including Sundanese, Javanese, and Baduy indigenous groups, who practice different faiths such as Islam, Christianity, Hinduism, Buddhism, and indigenous beliefs.	▪ Mandala Terminal/Rangkasbitung Station **(Infrastructure Site);** Ananda Avalokitesvara Monastery (**Cultural Site);** Rangkasbitung Chinatown (**Cultural Site);** Pasundan Church (**Cultural Site);** Immaculate Conception Catholic Church (**Cultural Site);** Balong Ranca Lentah/Food Court of Rangkasbitung Square (**Socio-Economic Site);** Al Araf Grand Mosque **(Cultural Site);** Tomb of Adipati Karta Natanagara (**Cultural Site);** Rangkasbitung Square (**Infrastructure Site);** Imah Batik Sahate (**Socio-Economic Site);** Cave of Mary Bukit Kanada (**Cultural Site**); ▪ Bayah Dome *Geopark* Information Center (**Infrastructure Site)**
E.3	**Menitis Culture Rangkasbitung** The sub themes pictures blending of indigenous traditions, historical influences, and local wisdom creates a unique cultural landscape that coexists harmoniously with nature. The beauty of culture in the Bayah Dome Geopark is reflected in its local communi-ties, traditional arts, rituals, and harmonious way of life.	▪ Mandala Terminal/Rangkasbitung Station **(Infrastructure Site);** ▪ Guriang Theater **(Cultural Site);** ▪ Sanggar Putra Panglipur (Penca drum making) (**Cultural Site);** ▪ Sanggar Lebak Membara (**Cultural Site);** ▪ Imah Batik Sahate (**Socio-Economic Site);** ▪ Multatuli Museum (**Cultural Site);** ▪ Balong Ranca Lentah/Food Court of Rangkasbitung Square (**Socio-Economic Site)**

F	Exploration The Beauty of Lebak	
F.1	**Exploring the Halimun Salak Mountains** The sub-theme that provides another picture of Lebak is seen from the beauty and coolness of nature at 700 above sea level. Another experience was enjoying Camellia Sinesis tea, one of the most expensive and high quality teas.	▪ Mandala Terminal/Rangkasbitung Station **(Infastructure Site);** Tirta Lebak Buana **(Nature Site);** Cibolang Slope (**Socio-Economic Site);** Kendeng Mountain Rest Area **(Infrastructure Site);** Kasepuhan Citorek **(Cultural Site);** Gunung Luhur (**Geological Site);** Cirotan Mineralization Complex (**Geological Site);** ▪ Cikuya Tea Garden (**Biological Site);** TNGHS - Lebak Damar (**Biological Site);** ▪ Curug Ciporolak (**Geological Site);** Kasepuhan Cisungsang (**Cultural Site);** ▪ Bayah Dome Geopark Information Center (**Infrastructure Site)**
F.2	**Discovering the Beauty of Waterfalls** Sub-theme that describes the upstream of the series of Bayah Dome formation by looking at the formed waterfalls, hills and beautiful sites.	▪ Bayah Dome *Geopark* Information Center (**Infrasctructure Site);** Bukit Curahem Shorea Forest (Biological Site); Curug Munding (**Geological Site);** Curug Rame (**Geological Site**); Curug Dengdeng (**Geological Site);** Malingping Ceu Bai Fish Baso **(Socio-Economic Site);** Malingping Terminal (**Infrastructure Site);** ▪ Citando Hot Springs (**Geological Site**)

C. Development of Geotrail Formulation

In developing a geotrail that also promotes geotourism, numerous aspects are taken into account:

One access road may serve as one or multiple geotourism routes characterised by a predominant feature.

1. Previously formed depending on market conditions and prior agreements
2. The designation of sub-themes will use local wisdom and the distinctive conditions of Lebak.

The guidelines for the establishment of this geotourism route comprised of:

1. Employ the Bayah Dome Geopark Information Centre as a central hub and knowledge repository for the Bayah Dome Geopark and the available geotourism routes.

2. Employ the terminals and stations of Rangkasbitung and Maja as hubs, as they serve as gathering points for tourists from diverse regions utilising this mode of transportation; hence, this transportation infrastructure must be organised to facilitate geotourism.

3. To facilitate access to the Bayah Dome Geopark via toll roads, collaboration with toll road operators is essential for promoting the Bayah Dome Geopark area.

4. Employ and establish terminals in additional locations of the Bayah Dome Geopark as Sub HUBs to serve as geotourism information centres.

5. Leveraging the site of the existing and forthcoming rest area as a Sub HUB, appropriate facilities and infrastructure are being developed to serve as a geotourism information centre.

This research introduces a systematic framework for geotrail development that integrates accessibility, thematic route design, and community involvement. The research provides geotrail routes that optimise tourist access by mapping transit hubs, existing road networks, and geosite sites, while ensuring ecological and cultural sustainability. This holistic approach distinguishes itself from prior studies, which frequently prioritises either conservation or visitor access, seldom integrating both cohesively into geotrail planning. In light of the aforementioned concerns, six principal themes and other sub-themes have been categorized, anticipated to engage visitors in accordance with their individual preferences. The subject of the geotrail is illustrated in the table below. The categorisation of geotrails into principal themes (e.g., Coastal Scenic Scape, Science of Bayah Dome, Goldmine Heritage) and subordinate themes (e.g., Tracing Ancient Delta Deposits, Baduy Cultural Saba) exemplifies a novel approach to accommodate varied visitor preferences. This theme organisation not only improves tourist engagement but also establishes a narrative-driven geotourism experience, a facet that has been little examined in previous research. It underscores the significance of narrative in linking tourists to the geological and cultural legacy of the area.

The principle of developing this geotourism path seeks to develop the pillars of conservation, appreciation and education of geological heritage, so that as emphasized by Garcia et al. (2022) this geotourism route needs to be managed properly in order to help realize conservation and preservation. This path will offer educational experiences through interpretive storytelling and thematic structuring. It also emphasizes the integration of local communities, such as the Baduy Tribe and Kasepuhan Villages, into geotourism planning, ensuring that the trails support cultural preservation and generate economic opportunities. This study shows that accessibility is highlighted as a critical factor for geotourism success. By identifying potential routes and integrating transportation hubs (e.g., stations, terminals, and rest areas) with geosites, the study proposes a model for improving geotourism access while minimizing ecological impacts. This dual focus on development and conservation offers a balanced perspective that advances theoretical discussions on sustainable tourism infrastructure (Carrillo-Hernández et al., 2024). The focus on rural geotourism offers a fresh perspective that has been relatively underrepresented in existing literature. The land use significantly affects the established geotourism route, necessitating the anticipation and management of risks, such as land conversion driven by economic opportunities along the geotrail, which eventually jeopardises environmental sustainability in the surrounding area. Consequently, this can be mitigated or regulated by managing the development along the geotrail route. These contributions enhance our comprehension of geotourism theory and provide practical solutions for establishing sustainable and inclusive geotrail networks.

This study's thematic organisation of geotrails corresponds with the global focus on improving tourist experiences via narrative-driven tourism. Prior research by Carrillo-Hernández et al. (2024) has emphasised the significance of thematic geotrails in fostering meaningful and educational visitor experiences. This study enhances the concept by amalgamating cultural and ecological diversity with geological characteristics, resulting in multidimensional geotrails that accommodate varied interests. The greater interconnectedness is less apparent in studies that concentrate exclusively on geological aspects (Dowling, 2023). Eventhough, Stolz & Megerle (2022) highlighted the difficulties of enhancing accessibility while maintaining ecological sustainability. This study reflects these concerns and offers practical answers by utilising existing road networks

and carefully positioning transportation hubs to minimise environmental disruption. This research distinguishes itself by integrating transportation and infrastructure planning into geotourism development, unlike studies that largely concentrate on site conservation (Morante-Carballo et al., 2023). The study's comprehensive methodology for geotrail planning functions as a replicable framework for geoparks globally. This research provides practical solutions for geoparks to improve their worldwide attractiveness and competitiveness in the tourism sector by illustrating methods for clustering varied geosites and creating thematic trails. The results are especially pertinent for geoparks in developing areas, where resource limitations and ecological sensitivities sometimes present considerable obstacles. This study demonstrates the equilibrium attained between accessibility and conservation, underscoring geotourism's capacity to advance sustainable development goals (SDGs) (Frey, 2021).

The findings enhance conversations on how tourism may promote conservation and education while minimising environmental damage and enhancing infrastructure, without jeopardising ecological integrity. This work establishes a standard for innovative geotourism planning through the integration of thematic geotrails, cluster and path analysis, community involvement. It solves current research deficiencies by offering a reproducible and sustainable concept for geoparks worldwide. The results indicate that geotourism can successfully harmonise conservation, education, and economic development, providing significant insights for policymakers, geotourism managers, and conservationists aiming to enhance the role of geoparks in promoting sustainable tourism.

CONCLUSIONS

The results of the Bayah Dome Geopark study provide substantial insights that extend beyond local and regional contexts, serving as a paradigm for geotourism development in geoparks globally. The amalgamation of infrastructure mapping, accessibility planning, and environmental conservation establishes a benchmark for sustainable geotourism development. Numerous geoparks encounter difficulties in preserving ecological integrity while enhancing accessibility. The Bayah Dome Geopark exemplifies the resolution of these difficulties by the strategic utilisation of existing road networks and traffic hubs, while concurrently minimising ecological disturbances. This strategy can be particularly advantageous for geoparks situated in isolated or rural areas with analogous topographical and biological limitations.

Thematic grouping facilitates geotrail construction and improves marketing and branding prospects. By establishing unique themes and tales, geoparks may appeal to various tourist demographics and foster unforgettable experiences. This branding strategy can assist geoparks globally in distinguishing themselves within a progressively competitive tourism sector.

The study offers a data-driven paradigm for establishing geotourism infrastructure, emphasising the significance of accessibility, geosite clustering, and transportation network integration. This approach enables policymakers to prioritise infrastructure expenditures, establish thematic tourism zones, and formulate policies to augment the competitiveness of geotourism in particular regions. The results correspond with national and regional sustainable development objectives, providing practical recommendations that can guide policy frameworks for geopark management and tourism growth.

This study on Geotrails in the Bayah Dome Geopark provides a comprehensive framework for geotourism development, accessibility enhancements, and geoconservation. However, there are several limitations that must be recognized. The research identifies infrastructure requirements, transit centers, and road networks; however, it does not quantitatively evaluate accessibility constraints, road conditions, or travel time. Deeper insights into the optimization of infrastructure improvements and visitor movement could be obtained through a more exhaustive transportation impact analysis. A comprehensive transportation impact analysis should evaluate the travel time between geosites, transit options, and road conditions. This could entail the implementation of alternative transportation solutions, such as eco-friendly shuttle services or cycle trails, as well as traffic flow modeling and accessibility heatmaps.

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THE INFLUENCE OF DIGITAL PLATFORM MOVIES ON SHAPING THE PERCEPTIONS OF THE JORDANIAN AUDIENCE TOWARDS TOURIST DESTINATIONS

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Abstract: Digital movie platforms are one of the most prominent modern entertainment mediums that play an increasing role in influencing audience perceptions on various topics, including tourist destinations. The study aimed to evaluate the impact of digital platform films on perceptions of tourist places among the Jordanian public, using a questionnaire on a purposive sample of 400 Jordanians. The study revealed that the majority of respondents (47.2%) watch films on digital platforms extensively, with Netflix being the most popular platform for film consumption. The beautiful depiction of these locations was the main feature of digital platform films that shaped respondents' perceptions of destinations. Furthermore, digital platform films about destination depictions, as well as their role in promoting cultural communication and understanding, significantly influenced the choice of destinations. Although the impact of these films on promoting tourist destinations was moderate, it has been proven that increasing the number of viewers of films on digital platforms significantly enhances their ability to shape the image of tourist destinations and improve communication and cultural understanding. Results show that younger and more educated consumers are more interested in the places depicted when they use these channels. Demographic factors influence media consumption patterns, and digital films can be great tools for tourism marketing and cultural interchange. The findings of the study also show that there is no correlation between the degree of respondents' viewing of digital platform films and the role these films play in promoting tourist destinations from the study sample perspective. This indicates that the frequency of watching digital platform films does not influence the promotion of tourist destinations. Meanwhile the results demonstrate that there is a positive correlation between the degree of respondents' viewing of digital platform films and the role these films play in influencing their choice of tourist destinations. This suggests that the more respondents watch digital platform films, the more these films influence their choice of tourist destinations. Furthermore, the study opens pathways for tourism policy makers to collaborate with media producers to create cinematic portrayals that both attract international interest and enrich the domestic tourism landscape. Future research could expand on these insights by exploring the long-term effects of repeated digital film exposure on tourism behaviors and investigating how genre-specific content contributes to the appeal of travel destinations.

Keywords: digital platform films, Jordanian Public, tourist destinations, cultural communication, tourism impact

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INTRODUCTION

The film industry is one of the most significant forms of entertainment and mass communication in the modern era, distinguished by its unique ability to convey stories and ideas through both big and small screens, capturing the audience's attention, emotions, and imagination (Brooks, 2019). The film industry encompasses several elements such as screenplay, acting, cinematography, editing, and visual effects, all of which collaborate to create an engaging cinematic experience (Patil et al., 2023). The impact of cinema and films on audiences cannot be overlooked, as films leave a profound influence on their perceptions and concepts (Gao et al., 2023). Films achieve this by using stories and characters to convey various messages and values and by highlighting significant social and cultural issues (Suma et al., 2024). When these works are produced excellently, they leave a more significant impact on the viewer (Eneizat et al., 2023; McCormack et al., 2023). Digital streaming platforms have become an alternative to traditional television and cinemas, offering viewers a pleasurable watching experience tailored to their individual needs (Sharadga et al., 2023). These platforms vary between free options like YouTube and Facebook and paid services such as Shahid, OSN, Netflix, and Watch It. These platforms provide viewers with the ability

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to watch their favorite films continuously and allow them to control the time and place of viewing, enabling them to enjoy the development of dramatic events and immerse themselves in the psychological atmosphere of the works (Ulin, 2022).

This can lead to the viewers of these platform films adopting specific ideas, attitudes, and behaviors or refraining from them (McCormack et al., 2023). The film industry on digital platforms wields undeniable power in shaping audience opinions and directing their interests, particularly in forming the image of global tourist destinations for viewers (Dašić & Kostadinović, 2023). Many researchers have often found that television series and films, whether cinematic or available on digital platforms, can increase the number of tourists visiting the depicted destinations. However, studies rarely pinpoint the exact reasons behind this (Phomsiri, 2015). For example, the depiction of New Zealand in Peter Jackson's "The Lord of the Rings" trilogy positively impacted tourism there, as did the influence of the series "The Walking Dead" on various destinations in Georgia, USA (Phomsiri, 2015). Many tourists visit small or non-touristic towns as a result of their exposure to the mentioned film content. Research in the field of tourism marketing has highlighted the role of media, including films and television works with a touristic nature, in shaping tourists' decisions to visit the intended tourist destination (Amin & Ben Ahmed, 2022). The role of digital media in influencing audience perceptions has been consistently highlighted in academic research across many societal aspects (Ahmad et al., 2022; AL-Jalabneh, 2023; Aljalabneh et al., 2023; Eneizat et al., 2024).

With the rapid advancement of technology and the proliferation of online cinematic content, films have consequently begun to exert a significant influence on how audiences perceive the world around them (Chen & Shen, 2021). Therefore, this study specifically addresses the role of digital platform films in shaping the expectations and interests of the Jordanian public, particularly regarding tourist destinations. By exploring how cinematic works influence public perceptions, this study consequently seeks to uncover the underlying mechanisms through which films impact audience attitudes and behaviors. Understanding these effects is, therefore, crucial for developing effective promotional strategies that not only enhance tourism awareness but also foster a deeper cultural connection between Jordan and the broader world. Ultimately, this research aims to answer the central question: What is the impact of digital platform films on shaping the perceptions of the Jordanian audience toward tourist destinations?

LITERATURE REVIEW

The intersection of cinema and tourism has increasingly captivated academic interest, particularly in understanding how films influence audience perceptions and behaviors toward tourist destinations. Over the years, various studies have explored the potential of films to promote tourism, revealing both the power and the challenges associated with film-induced tourism. Shatnawi (2022) examined the role of documentary films in promoting domestic tourism within Jordan, finding that these films play a moderate role in boosting local tourism. The study emphasized that documentary films are particularly effective in raising awareness about the historical significance of tourist sites. This suggests that films, by offering detailed and engaging portrayals of destinations, can serve as powerful tools for tourism promotion. However, the study also noted a limited emotional impact on viewers, indicating that while documentaries can inform and educate, their ability to evoke strong emotional connections - crucial for influencing travel behavior - may be lacking. This finding opens up opportunities for filmmakers to explore more immersive and emotionally engaging techniques in documentary filmmaking to enhance their effectiveness in promoting tourism. In a similar vein, Hamouda (2021) investigated the role of documentary films in promoting tourism in Sudan. Hamouda's study highlighted the importance of well-chosen subjects and the presence of qualified personnel in producing successful tourism-promoting documentaries. The study found that while documentaries could effectively promote Sudanese tourism by highlighting the country's unique cultural and natural heritage, significant obstacles such as insufficient funding and ongoing conflicts undermine these efforts. This study aligns with Shatnawi's findings, suggesting that while documentaries have the potential to promote tourism, their effectiveness is highly contingent upon overcoming contextual challenges such as resource availability and the broader socio-political environment.

Amin & Ben Ahmed (2022) expanded on the role of documentary films by focusing on French films that market Algerian tourist destinations. Their research demonstrated that these films present Algerian destinations in a positive light, utilizing rich content to convey the country's diverse tourism offerings. Unlike the studies focused on Jordan and Sudan, which primarily addressed the domestic impact of documentary films, Amin and Al-Tahir's study highlighted the potential of international documentary films to attract foreign audiences. The study underscored the importance of narrative richness and artistic presentation in effectively promoting tourism, even if some artistic exaggerations were present. This suggests that the global reach and cultural context of the films play a significant role in shaping their impact on tourism.

Beyond documentaries, the concept of film-induced tourism has been explored in various contexts, demonstrating the significant influence that narrative films can have on audience perceptions and subsequent travel behavior. For instance, Wati et al., (2022) analyzed the impact of Korean dramas on the intention to visit South Korea. Their study found that films significantly impact visit intentions, even without mediating destination image. This finding is particularly notable as it suggests that the narrative and cultural appeal of the films alone are sufficient to stimulate interest and drive tourism. The study highlights the importance of cultural narratives and the global popularity of specific film genres, such as Korean dramas, in driving tourism to specific destinations. It also points to the potential for other countries to leverage their cultural narratives through film to enhance their tourism appeal.

Vara (2020) provided a broader perspective by examining the film industry's impact on tourism. Through a survey of 201 respondents and seven personal interviews, the study revealed that over half of the participants had engaged in film-induced tourism. Vara's research highlighted that the trend of film-induced tourism is driven by the immersive experiences that films offer. The study emphasized that modern technologies, such as virtual reality and augmented reality, further enhance these experiences, making film locations more accessible and attractive to tourists. Additionally, the study pointed out that film-induced tourism promotes popular destinations and revitalizes lesser-known locations, helping stimulate local

economies and mitigate the effects of depopulation in rural areas. This underscores the multifaceted benefits of film-induced tourism, which extend beyond mere tourist numbers to broader socio-economic impacts.

Nunes (2022) offered a comprehensive analysis of recent advances in film-induced tourism, identifying strengths, gaps, and opportunities in the field. Nunes' work is particularly valuable as it highlights the global expansion of film-induced tourism research, which has moved from being a niche area of study in the United States and the United Kingdom to becoming a worldwide phenomenon, especially in Asia. The study underscored the importance of understanding the marketing potential of films and the need for more research to explore how different types of cinematic content impact tourism in various cultural contexts. Nunes also pointed out the gaps in current research, such as the need for longitudinal studies that track the long-term impact of films on tourism and the role of emerging digital platforms in shaping tourism trends.

According to Amr et al. (2023), dramatic representations of Egyptian sites significantly enhance the intentions of local Egyptian visitors to visit those sites. Moreover, dramatic features influence the intention to visit the depicted destination. This study makes multiple contributions to drama tourism and its components by enhancing previous research and providing new findings. The practical results of this study also help the Egyptian government, marketers, and destination management organizations (DMOs) in promoting Egyptian destinations.

The study by Rawahneh (2020) explored the effectiveness of image sharing on social media platforms in promoting lesser-known archaeological sites in Jordan. The findings indicated that social media plays a significant role in tourism promotion, particularly in enhancing the visibility of underrepresented sites. Rawahneh's research suggests that while traditional filmmaking faces certain barriers, digital platforms and social media offer alternative avenues for promoting tourism. The study found that social media platforms, through the sharing of images and user-generated content, can significantly boost the profile of lesser-known destinations, thereby increasing tourist interest and visitation. This highlights the potential for integrating traditional media with digital platforms to create more comprehensive and effective tourism marketing strategies. Maqarash (2020) also explored the impact of media on improving the perception of tourist destinations, focusing on Jijel, Algeria. The study found that media positively influences the perception of natural environments and safety conditions in tourist destinations. However, the study also pointed out that media's impact on enhancing perceptions of amenities and infrastructure was limited. This indicates that while films and other media forms can effectively highlight certain appealing aspects of a destination, they may fall short in addressing more practical considerations that are crucial for tourists. Maqarash's findings suggest the need for a more balanced media portrayal that includes both the attractions and the practical aspects of visiting a destination.

The influence of specific films on tourism has also been explored in the context of Jordan. Kanaan et al. (2019) studied the impact of films like "Lawrence of Arabia" and "Indiana Jones" on tourists visiting Jordan, finding that film tourism in Jordan is still emerging as a secondary experience, with limited recognition of filming locations among tourists. The study highlighted that while these films have undoubtedly raised awareness of Jordan as a travel destination, there is still significant potential to develop and market these sites more effectively. Their study emphasized the importance of integrating film tourism into broader tourism strategies, including better signage at filming locations, themed tours, and promotional materials that link the cinematic history of the sites to the overall tourist experience.

Justus (2018) took a different angle by examining the effect of stereotypes created by films on the satisfaction of tourists with movie-induced tourism, focusing on two films set in Kenya. The study found that stereotypes in films can have a significant negative impact on tourist satisfaction. For example, tourists who visited Kenya after watching films like "Out of Africa" and "The White Maasai" were often disappointed when their experiences did not match the idyllic or exoticized portrayals in the films. This finding underscores the importance of accuracy and cultural sensitivity in film portrayals of destinations, as unrealistic or stereotypical representations can lead to negative tourist experiences and harm the destination's image. Phomsiri (2015) provided a case study of film tourism in Thailand, examining the effectiveness of media in promoting tourism through cinematic content. The study found that while films can attract tourists to filming locations, the influx of tourists can also have negative effects, such as environmental degradation and cultural disruption. Phomsiri's research highlighted the importance of managing film tourism sustainably, ensuring that the benefits are maximized while minimizing negative impacts on the destination.

The existing body of research underscores the significant role that films play in influencing tourism. While traditional filmmaking has proven effective in promoting tourism through emotional and cognitive engagement, digital platforms present new opportunities and challenges. The current study seeks to fill a gap in the literature by focusing on how digital platform films specifically influence the perceptions and behaviors of the Jordanian audience regarding tourist destinations. By doing so, it aims to provide a deeper understanding of the mechanisms through which films shape tourism dynamics in the digital age, offering insights that could inform the development of targeted tourism marketing strategies that leverage the power of digital media to enhance tourism promotion and cultural exchange.

STUDY QUESTIONS

This study seeks to answer the main research question: What is the impact of digital platform films on shaping the perceptions of the Jordanian audience towards tourist destinations?

Under this main question, several sub-questions are formulated as follows:

1. What is the extent of the Jordanian audience's viewership of digital platform films?
2. What digital platforms are primarily used by the Jordanian audience to watch various films?
3. What is the role of locally produced digital films in promoting tourist destinations from the perspective of the Jordanian audience?
4. What is the impact of digital platform films on the choice of tourist destinations by the Jordanian audience?

STUDY HYPOTHESES

1. There are statistically significant differences in the extent of the Jordanian audience's viewership of digital platform films attributed to their personal characteristics.
2. There is a correlational relationship between the extent of the Jordanian audience's viewership of digital platform films and their role in promoting tourist destinations from their perspective.
3. There is a correlational relationship between the extent of the Jordanian audience's viewership of digital platform films and the influence of these films on their choice of tourist destinations.

MATERIALS AND METHODS

This quantitative study employs a questionnaire as its primary data collection tool within the framework of descriptive research. A media audience survey targeted a purposive sample of the Jordanian public who regularly watch digital platform films. The primary objective was to examine how these films shape the audience's perceptions of both domestic and international tourist destinations. The study population comprised Jordanians who use one or more digital platforms. A purposive sample of 400 individuals was selected, each with accounts on platforms such as Netflix, Watch It, Shahid, OSN, YouTube, Facebook, and Apple TV+. The sample was sourced from the Royal Film Commission's databases to ensure a representative cross-section of the population. The questionnaire, administered electronically, included sections on demographic data, the extent of engagement with digital platform films, the platforms used, and how these films influence perceptions of tourist destinations. It also assessed the films' role in shaping destination images, enhancing cultural communication, and influencing destination choices. A four-point scale was used to measure respondents' agreement with each item, ranging from 0 (lowest) to 3 (highest).

The scale was interpreted as follows: 0.00 – 1.00 = Low, 1.01 – 2.00 = Medium, and 2.01 – 3.00 = High. To ensure validity, the questionnaire underwent face validity assessment by a panel of experts to confirm that it met the study's objectives, addressed research questions, and was suitable for field application. The reliability of the instrument was then assessed using SPSS to calculate Cronbach's Alpha. The overall reliability was 96.8%, with individual section coefficients ranging from 91.1% to 95.6%, all of which are highly acceptable in media research.

RESULTS AND DISCUSSIONS

Degree of viewing digital platform films

The study revealed that a significant portion of respondents watch digital platform films to a large extent, with 47.2% (189 respondents) falling into this category. Those who watch these films to a medium extent comprised 40% (160 respondents), while 12.8% (51 respondents) watch them to a lesser extent. Standard Deviation: SD

Table 1 revealed that the most prominent digital platforms through which respondents watch films are "Netflix," with an arithmetic mean of 2.28 (high degree), and "Shahid," with a mean of 1.11 (medium degree). The least used platforms were "OSN," with a mean of 0.0075 (low degree), and "Watch It," with a mean of 0.0025 (low degree).

Table 1. Digital Platforms through Which Respondents Watch Films

Digital Platform	Mean	SD	Viewing Degree
Netflix	2.28	0.8060	High
Shahid	1.11	0.9830	Medium
YouTube	1.07	0.9280	Medium
Facebook	0.6190	0.4960	Low
Apple TV+	0.0100	0.0990	Low
OSN	0.00750	0.0860	Low
Watch It	0.00250	0.04990	Low
Overall Mean	**0.730**	**0.429**	**Low**

Role of local digital films in promoting tourist destinations

Data in Table 2 showed that the role of local digital films in promoting tourist destinations, as perceived by the respondents, is moderate overall, with an average mean score of 1.76. The most prominent role identified was "reflects the aesthetics and landmarks of local tourist destinations," with a high mean score of 2.02.

Table 2. Role of Local Digital Films in Promoting Tourist Destinations from the Respondents' Perspective

Items	Mean	SD	Degree
Reflects the aesthetics and landmarks of local tourist destinations.	2.02	0.763	High
Increases knowledge of local cuisine at tourist destinations.	1.86	0.742	Medium
Sparks interest in visiting local tourist destinations.	1.84	0.763	Medium
Introduces local customs and traditions at tourist destinations.	1.81	0.763	Medium
Enhances understanding of local dialects at tourist destinations.	1.80	0.728	Medium
Enhances understanding of the culture, history, and heritage of local tourist destinations.	1.74	0.749	Medium
Introduces activities and events at local tourist destinations.	1.68	0.763	Medium
Provides realistic and enjoyable travel experiences at local tourist destinations.	1.67	0.799	Medium
Informs about the weather conditions at local tourist destinations.	1.60	0.797	Medium
Informs about the routes to reach local tourist destinations.	1.60	0.832	Medium
Overall Mean	**1.76**	**0.649**	**Medium**

This is followed by "increases knowledge of local cuisine at tourist destinations" with a mean score of 1.86, and "sparks interest in visiting local tourist destinations" with a mean score of 1.84, both rated as moderate. The least impactful roles were "provides realistic and enjoyable travel experiences at local tourist destinations" with a mean score of 1.67, and "informs about the weather conditions" and "routes to reach local tourist destinations," both with a mean score of 1.60, also rated as moderate.

Impact of digital platform films on the choice of tourist destinations

The data from Table 3 indicated that the impact of digital platform films on respondents' choice of tourist destinations is generally high, with an overall mean score of 2.17. The most significant impacts include "creating a desire to visit tourist destinations seen in films" with a high mean score of 2.49, followed by "encouraging visits to non-traditional and lesser-known destinations" with a mean score of 2.40, and "inspiring visits through aesthetic and inspiring depictions of tourist destinations" with a mean score of 2.32. The less impactful influences were "increasing knowledge of tourist activities before travel decisions" with a mean score of 1.98, "offering a realistic pre-travel experience of tourist destinations" with a mean score of 1.94, and "providing detailed information about tourist destinations" with a mean score of 1.86, all rated as medium in their influence.

Table 3. Impact of Digital Platform Films on Respondents' Choice of Tourist Destinations

Items	Mean	SD	Degree
Creates a desire to visit tourist destinations seen in films.	2.49	0.656	High
Encourages visits to non-traditional and lesser-known destinations.	2.40	0.686	High
Inspires visits through aesthetic and inspiring depictions of tourist destinations.	2.32	0.734	High
Encourages exploration and visits to new tourist destinations.	2.30	0.707	High
Presents tourist destinations as magical places worth visiting.	2.19	0.718	High
Expresses local culture and society, making tourist destinations attractive.	2.12	0.671	High
Provides insights into experiences, reviews, and stories connected to tourist destinations.	2.05	0.709	High
Increases knowledge of tourist activities before travel decisions.	1.98	0.710	Medium
Offers a realistic pre-travel experience of tourist destinations.	1.94	0.734	Medium
Provides detailed information about tourist destinations.	1.86	0.732	Medium
Overall Mean	**2.17**	**0.538**	**High**

HYPOTHESES TESTS

Hypothesis 1: There are statistically significant differences in the degree of Jordanian audiences' viewing of digital platform films attributed to their personal characteristics.

The hypothesis testing results in Table 4 revealed insightful patterns regarding the influence of personal characteristics - gender, age, educational level, and place of residence - on the viewing habits of digital platform films among the Jordanian audience. A T-test was conducted to examine gender differences, which showed no statistically significant variation between males and females in their engagement with digital platform films. The mean scores were closely aligned, indicating that gender does not substantially affect viewing behaviors. In contrast, age, Educational Level, and Place of Residence were found to be a significant determinant, as demonstrated by the ANOVA results.

Table 4. Hypothesis Testing Results by Personal Characteristics

Variable	Group/Category	N	M	SD	Test	Value	Sig
Gender	Male	213	2.3879	0.6879	T-Test	1.273	0.204
	Female	187	2.2995	0.7003			
Age	Less than 30 years	243	2.5267	0.63172	ANOVA	18.144	0.000
	30 – 39 years	106	2.1604	0.67805			
	40 – 49 years	32	1.9687	0.73985			
	50 years and above	20	1.7500	0.63867			
Educational Level	Secondary School or Less	71	2.1690	0.79257	ANOVA	6.610	0.000
	Diploma Degree	31	2.0968	0.59749			
	Bachelor's Degree	257	2.4591	0.63683			
	Postgraduate Studies	42	2.1429	0.78310			
Place of Residence	Northern Region	155	2.2452	0.70565	ANOVA	6.590	0.002
	Central Region	177	2.4859	0.64056			
	Southern Region	69	2.2174	0.74497			

Table 5. LSD test for differences

Variable	Category (I)	Other Categories (J)	Mean Difference (I-J)	Sig.
Age	Less than 30 years	30 – 39 years	0.36637	0.000
		40 – 49 years	0.55800	0.000
		50 years and above	0.77675	0.000
Educational Level	Bachelor's Degree	Secondary School or Less	0.29013	0.002
		Diploma Degree	0.36237	0.005
		Postgraduate Studies	0.31629	0.005
Place of Residence	Central Region	Northern Region	0.24071	0.002
		Southern Region	0.26848	0.006

Table 5 illustrated an inverse correlation between age and the frequency of respondents' viewing of digital platform films. Respondents under 30 years of age ranked highest in digital film consumption, followed by those aged 30-39 years, then 40-49 years, with those aged 50 years and above ranking lowest. It also indicates that individuals with a "Bachelor's" degree engage with films on digital platforms more frequently than others, followed by those with a "High School or less" education, then those with a "Postgraduate" degree, and lastly, those with an "Intermediate Diploma." The data also shows that residents of the "Central Region" engage with digital platform films more than those in other regions, followed by those in the "Northern Region," and subsequently, those in the "Southern Region."

Hypothesis 2: There is a correlation between the degree of Jordanian audiences' viewing of digital platform films and the role these films play in promoting tourist destinations from their perspective. The Pearson Correlation Coefficient in Table 6 showed that there is no correlation between the degree of respondents' viewing of digital platform films and the role these films play in promoting tourist destinations from their perspective. The correlation coefficient value was 0.019 with a significance level of 0.701, which is not statistically significant at the 0.05 level. This indicates that the frequency of watching digital platform films does not influence the promotion of tourist destinations.

Hypothesis 3: There is a correlation between the degree of Jordanian audiences' viewing of digital platform films and the role these films play in influencing their choice of tourist destinations. The Pearson Correlation Coefficient in Table 7 presented a positive correlation between the degree of respondents' viewing of digital platform films and the role these films play in influencing their choice of tourist destinations. The correlation coefficient value was 0.344 with a significance level of 0.000, which is statistically significant at the 0.05 level. This indicates that the more respondents watch digital platform films, the more these films influence their choice of tourist destinations.

Table 6. Pearson Correlation Coefficient

Degree of Viewing Digital Platform Films			
Role of Films in Promoting Tourist Destinations	Frequency	Pearson Correlation Coefficient	Sig
	400	0.019	0.701

Table 7. Pearson Correlation

Degree of Viewing Digital Platform Films			
Influence of Films on the Choice of Tourist Destinations	Frequency	Pearson Correlation Coefficient	Sig
	400	0.344	0.000

The findings of this study indicated a significant impact of digital platform movies on the Jordanian audience's perceptions and choices concerning tourist destinations. This aligns with previous research suggesting that cinematic depictions can shape viewers' mental images and expectations about specific locales (Chen & Shen, 2021; Oshriyeh & Capriello, 2022). The high engagement of Jordanians with digital platforms, particularly Netflix, reinforces the platform's potential to serve as a medium for tourism marketing by offering an aesthetically appealing portrayal of global destinations. Such representations can effectively attract viewers and influence their travel decisions, a phenomenon also observed in previous studies on film-induced tourism (Vara, 2020). The correlation between high viewership and interest in tourism destinations supports the theory that repeated exposure to specific images and narratives can cultivate favorable perceptions and intentions toward these destinations (Wati et al., 2022). In addition, the data revealed that Netflix is the primary platform for Jordanians viewing films that feature tourist destinations. The popularity of Netflix, a global platform, suggests that internationally produced content has considerable influence on the Jordanian audience, which may not be as effectively achieved by local platforms. This raises questions about the representation of Jordanian or regional destinations and the ability of domestic platforms to compete in shaping local audiences' tourism preferences. Furthermore, the dominance of international content suggests that, while Jordanian audiences are influenced by these portrayals, there is room for increased investment in local cinematic productions to promote domestic tourism, aligning with findings from Liu et al. (2020) and Kim and Park (2024) on the role of local media in promoting tourism.

Another significant aspect of this study is the influence of demographic variables on viewing habits, especially age, educational level, and place of residence. Younger audiences displayed a higher frequency of engagement with digital platform films, suggesting that tourism marketing strategies might benefit from targeting this demographic through digital media. This aligns with the literature on the media consumption habits of younger generations, who are more inclined toward digital content due to its accessibility and variety (Sharma & Lulandala, 2023). Similarly, viewers with a bachelor's degree and those living in urban, central regions also showed higher engagement levels, possibly due to greater exposure to diverse content and increased access to digital platforms. This demographic insight allows marketers to better understand and reach potential audiences by tailoring content to reflect the preferences of these groups.

Moreover, a notable finding in this study is that digital platform movies promote cultural understanding and communication. The enjoyment and immersion that audiences experience can enhance cultural empathy and awareness, a point substantiated by other studies that suggest that films can act as cultural bridges, fostering an appreciation for diversity (Atta & Siddiq 2023; Xiaojuan, 2023). For Jordanian audiences, exposure to diverse cultures through film can facilitate a broader understanding and acceptance of other societies, ultimately promoting cultural exchange. However, while the study indicates an appreciation for international tourism destinations, the moderate impact of digital platform films in promoting Jordanian tourism implies a gap in local representation within the global digital landscape.

The findings also suggest that locally produced films moderately impact promoting Jordanian tourism, revealing both challenges and opportunities for enhancement. While local films contribute to cultural representation and can effectively

depict local customs, traditions, and landmarks, they fail to create a compelling narrative that competes with international productions. This is consistent with the findings of Marafa et al. (2022) and Sigala (2020), who noted challenges such as high production costs and insufficient infrastructure that can hinder local media's tourism impact. These insights emphasize the need for investment in high-quality local content and collaborative efforts between filmmakers and tourism authorities to create productions that can showcase Jordanian destinations on a larger scale (Salem & Twining-Ward, 2018).

The study's results also underscore the practical implications of utilizing digital platform films as a tool for tourism marketing. As the findings indicate a significant influence of film viewership on destination choice, tourism marketers could leverage partnerships with digital platforms to promote both international and local destinations. Emphasizing cinematic qualities that portray tourist sites in an aesthetically appealing manner could attract audiences, as the enjoyment of visually captivating content correlates with positive perceptions of the depicted destinations (Sharma & Lulandala, 2023; Huimin & Albattat, 2024). Moreover, by aligning promotional strategies with popular platforms like Netflix, tourism boards could reach a wider demographic, particularly the younger, urban population identified in the study as heavy users of digital film content.

CONCLUSION

This study underscores the substantial role that digital platform films play in shaping the perceptions and tourism interests of the Jordanian public. By confirming the strong influence of platforms such as Netflix on travel preferences, the research aligns with broader findings on film-induced tourism and demonstrates the capacity of digital content to foster aesthetic appeal and cultural engagement with specific locales. Demographic factors, including age and educational level, emerge as significant indicators of media engagement, suggesting that tourism marketing strategies can effectively target younger, urban populations through digital platforms. While the findings highlight the potential of international productions in tourism promotion, they also point to the challenges facing local film industries in achieving similar influence. The moderate impact of local films in promoting Jordanian destinations suggests a need for enhanced investment in high-quality productions that can compete on a global scale, encouraging cultural tourism while promoting national heritage. By positioning digital platform films as strategic tools for tourism, the study opens pathways for tourism boards to collaborate with media producers, aiming to create compelling cinematic portrayals that both attract international interest and enrich the domestic tourism landscape. Future research could expand on these insights by exploring the long-term effects of repeated digital film exposure on tourism behaviors and investigating how genre-specific content contributes to the appeal of travel destinations.

Limitations

Despite the great importance that this study reveals regarding the impact of digital platform films on shaping the perceptions and interests of the Jordanian public in tourism, it is not without some limitations. First, the study is limited to analyzing the impact of specific platforms such as Netflix, which may not reflect the full impact of other digital platforms such as Amazon Prime or Disney Plus. Second, the analysis is limited to a specific audience category, as it focused mainly on younger residents in urban areas, which may affect the generalization of the results to all segments of Jordanian society. Finally, although the study indicates the importance of demographic factors, it does not focus sufficiently on the impact of psychological and cultural factors that may play a major role in shaping travel preferences. Therefore, future research can expand to include the impact of other platforms, evaluate the impact of psychological and cultural factors on travel preferences, and study the role of local productions in cultural tourism.

Recommendations

This study suggests various potential research directions on how digital platform films affect Jordanian audience views and tourism. These directions can study the long-term impacts of regular exposure to such films on visitors' habits and how they change. The most effective film genres (drama, comedy, documentary) for enticing tourists to specific tourist places can also be examined. Additionally, locally made films can be compared to international films in promoting Jordanian tourism, and their success elements can be determined. Finally, tourists' digital content exchanges can be investigated and used to create more engaging and comprehensive tourism experiences. In conclusion, further research can help us understand how digital films can be used for tourism promotion and build more focused and appealing techniques to attract travelers to Jordan.

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EXPLORING MULTIDIMENSIONAL DRIVERS OF REVISIT INTENTIONS: THE CASE OF BANGKOKIAN MILLENNIALS AND JAPAN

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Abstract: This study investigates the multifaceted factors influencing revisit intentions among Bangkokian millennial tourists to Japan. Expanding traditional frameworks, the research incorporates nine key constructs - perceived destination image, travel motivation, travel cost, social influence, destination accessibility, cultural familiarity, emotional attachment, environmental factors, and service quality - to capture the intricate interplay of cognitive, emotional, and practical dimensions. Using a quantitative research design, data were collected from 400 respondents and analyzed through Structural Equation Modeling (SEM), uncovering critical insights into millennial travel behavior. The findings reveal that emotional attachment, service quality, and destination accessibility are the strongest predictors of revisit intentions, emphasizing the importance of personal connections, seamless travel experiences, and exceptional hospitality. Constructs such as cultural familiarity, perceived destination image, and environmental factors further enhance revisit intentions, while travel cost exerts a moderate negative influence, reflecting the cost-conscious nature of millennials. The study highlights the pivotal mediating roles of emotional attachment and cultural familiarity, illustrating how these constructs amplify the effects of destination attributes on loyalty. This research offers theoretical contributions by integrating emotional and cultural dimensions into the push-pull framework, providing a holistic perspective on tourist decision-making. Practical implications include strategies for tourism stakeholders to enhance loyalty through value-driven packages, emotional resonance campaigns, and sustainability-focused initiatives. By addressing the unique preferences of Thai millennials, this study delivers actionable insights for positioning Japan as a premier repeat destination. These findings not only advance tourism theory but also provide a blueprint for sustainable and loyalty-driven tourism strategies, ensuring long-term growth in an increasingly competitive global market.

Keywords: millennial tourists, travel behavior, multidimensional drivers, revisit intentions, Japanese tourism appeal, millennial travel motivations, Japan, Thailand

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INTRODUCTION

The surge in international travel among Thai millennials has emerged as a transformative force in global tourism, with Japan standing out as one of their most favored destinations. This demographic, particularly Bangkokian millennials, is drawn to Japan's unique combination of tradition and modernity, its vibrant cultural experiences, and exceptional accessibility.

Iconic seasonal attractions such as cherry blossoms, dynamic festivals, and world-renowned gastronomy further elevate Japan's appeal (Tian et al., 2020). Facilitated by relaxed visa policies and a well-developed tourism infrastructure, Japan has solidified its status as a preferred destination for Thai travelers, especially during public holidays. Despite the increasing importance of millennial travelers in shaping tourism trends, existing research predominantly focuses on first-time visitation motives, leaving the determinants of repeat visits relatively unexplored. This gap is particularly pronounced in culturally rich destinations like Japan, where repeat visitation behavior may differ significantly from initial travel motivations.

Previous studies have highlighted the influence of factors such as perceived destination image, travel motivation, travel cost, and social influence in shaping tourist decisions (Ferrer-Rosell & Marine-Roig, 2020; Jeong & Kim, 2020; Lee & Xue, 2020; Ramadania et al., 2021; Afshardoost & Eshaghi, 2020; Tavitiyaman et al., 2021). However, these frameworks often treat constructs in isolation, lacking the multidimensional depth required to capture the interplay of cognitive, emotional, and practical dimensions that influence repeat visitation. Thai millennials represent a particularly distinct and influential market segment, given their preferences for culturally immersive, experiential, and personalized travel.

They also exhibit nuanced travel behaviors, such as a heightened sensitivity to value-driven experiences and a growing inclination toward sustainability (Ketter, 2020; Biswas, 2023). Research addressing this demographic's unique needs and preferences remains sparse, especially concerning the factors that foster loyalty to specific destinations.

To bridge this gap, this study extends traditional tourism frameworks by integrating additional constructs that reflect the multifaceted nature of revisit intentions: destination accessibility, cultural familiarity, emotional attachment, environmental factors, and service quality. These constructs offer a holistic perspective, addressing both intrinsic motivations and external enablers of repeat visits. Destination accessibility evaluates the practical ease of navigating Japan, which is critical for urban millennial travelers who value time efficiency and convenience (Aceron et al., 2018; Utama & Gunadi, 2023).

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Cultural familiarity emphasizes the role of prior exposure to and comfort with Japanese culture, fostering deeper cognitive and emotional connections (Nazarian et al., 2024). Emotional attachment explores the sentimental value and personal connections cultivated during past visits, serving as a powerful motivator for loyalty (Sutiadiningsih et al., 2024; Cho, 2021). Environmental factors highlight Japan's natural beauty, seasonal attractions, and commitment to sustainability, which align with millennials' growing interest in eco-conscious travel (Chakraborty et al., 2024). Lastly, service quality underscores the significance of Japan's renowned hospitality and high-standard infrastructure in enhancing satisfaction and trust (Maki et al., 2025; Zhang et al., 2021). Using Structural Equation Modeling (SEM) to analyze data from 400 Bangkokian millennials, this research uncovers critical insights into the determinants of repeat visitation. By addressing gaps in existing literature and focusing on a highly relevant market segment, this study provides a nuanced understanding of how emotional, cultural, and practical factors interact to influence revisit intentions. The findings aim to inform tourism stakeholders in crafting targeted strategies that enhance destination loyalty while advancing sustainable tourism practices. This research thus contributes to both theoretical discourse and practical applications in destination marketing and millennial travel behavior.

Research Objectives

1. To identify the key determinants influencing revisit intentions
2. To examine the relationships among the key determinants influencing revisit intentions among Bangkokian millennial tourists traveling to Japan
3. To develop recommendations aimed at enhancing destination loyalty and effectively addressing the unique preferences and needs of millennial travelers

LITERATURE REVIEW

The constructs chosen for this study - perceived destination image, travel motivation, travel cost, social influence, destination accessibility, cultural familiarity, emotional attachment, environmental factors, and service quality - were selected to provide a comprehensive understanding of the factors influencing revisit intentions among Bangkokian millennial tourists to Japan. These constructs reflect a balanced integration of cognitive, emotional, and practical dimensions of tourist behavior. Perceived destination image, travel motivation, and social influence represent key cognitive drivers shaping tourists' perceptions and initial decisions. Emotional attachment and cultural familiarity delve into the affective domain, emphasizing personal connections and comfort with Japanese culture as critical motivators for repeat visits. Practical considerations such as travel cost, destination accessibility, and service quality highlight the logistical and experiential enablers that sustain loyalty. Environmental factors, increasingly significant among millennial travelers, reflect the growing emphasis on sustainability and natural beauty. Together, these constructs address both intrinsic motivations and external attributes, offering a multidimensional framework to uncover the complex interplay of factors driving repeat visits to culturally rich destinations like Japan. This selection aligns with existing tourism theories while incorporating contemporary trends and gaps in millennial travel research.

1. Perceived Destination Image

Perceived destination image refers to tourists' mental representations of a destination based on cognitive (factual attributes) and affective (emotional responses) dimensions. This construct is a pivotal determinant of travel behavior, as it influences tourists' satisfaction, loyalty, and likelihood to revisit a destination. A positive destination image not only enhances tourists' initial motivation to visit but also fosters a sense of attachment, which strengthens revisit intentions (Jeong & Kim, 2020; Nguyen Viet et al., 2020). For instance, a destination known for its safety, accessibility, and rich cultural experiences often leaves a lasting impression, encouraging repeat travel.

In the context of Japan, the destination image among Thai travellers is shaped by its iconic elements, including cherry blossoms, Mt. Fuji, vibrant cityscapes like Tokyo and Osaka, and its reputation for exceptional hospitality and cleanliness. Japanese cultural heritage, exemplified by festivals, tea ceremonies, and traditional architecture, adds an emotional allure that resonates strongly with Thai millennials. Studies show that visual imagery disseminated through social media platforms such as Instagram and TikTok further amplifies the appeal of Japan, particularly for millennials who value visually stunning and culturally enriching experiences (Poon, 2021; Tanaka & Huang, 2024). Moreover, the cognitive and affective dimensions of Japan's destination image work synergistically to create a holistic perception. While cognitive elements like efficient public transport and affordability make the destination practical, the affective dimension - characterized by feelings of warmth, joy, and awe - builds emotional connections that enhance loyalty (Lee-Anant, 2022). However, research specifically targeting Thai millennials' perceptions of Japan's destination image and its evolution during repeat visits remains sparse, marking a critical gap in understanding how destination image influences long-term travel behavior.

2. Travel Motivation

Travel motivation, a core concept in tourism research, examines the intrinsic and extrinsic factors that drive individuals to embark on travel. Based on the push-pull framework, push factors originate from tourists' internal desires - such as the need for relaxation, self-discovery, or escape from routine - while pull factors are external attractions offered by the destination, such as cultural landmarks, natural beauty, or unique experiences (Suni & Pesonen, 2019). Understanding the interaction between these motivations provides insights into tourists' preferences and behaviours. Thai millennials are often motivated by a mix of push and pull factors. Push motivations include the desire to experience a different culture, gain knowledge, and create memorable experiences for personal growth and social recognition. Pull

factors specific to Japan encompass its seasonal attractions, cultural richness, and globally renowned gastronomy, such as sushi, ramen, and matcha-based delicacies. For repeat visitors, these motivations shift toward deeper engagement with local customs, exploring off-the-beaten-path destinations, and revisiting places of sentimental value (Dean & Suhartanto, 2019; Utama & Gunadi, 2023; Mohammad, 2024). Moreover, travel motivations of repeat tourists often differ from those of first-time visitors. First-timers may prioritize novelty and iconic attractions, while repeat visitors tend to seek unique, tailored experiences that provide deeper cultural immersion and personal fulfilment. However, research that dissects the nuances of Thai millennials' travel motivations—particularly how these evolve between first-time and repeat visits to Japan—remains limited, highlighting a critical area for further investigation.

3. Travel Cost

Travel cost, encompassing all financial and non-financial resources expended during a trip, is a significant determinant of travel decision-making. Millennials, including those in Bangkok, are particularly cost-conscious, often seeking value-for-money experiences that maximize satisfaction while minimizing expenditure. Studies have shown that perceived affordability, coupled with promotional campaigns and seasonal discounts, positively influences tourists' willingness to travel and their likelihood to return (Poon, 2021; Parady et al., 2020).

Japan's affordability for Thai travellers is influenced by factors such as competitive airline fares, discounted travel packages, and a wide range of accommodations that cater to different budgets - from luxury hotels to affordable capsule lodgings. The favorable exchange rate between the Thai baht and the Japanese yen also enhances the perceived value of traveling to Japan. Additionally, cost-effective transportation options, such as Japan's extensive rail network and regional travel passes, contribute to an economical and convenient travel experience (Maki et al., 2025.

Despite these advantages, travel costs can act as a barrier for certain segments of millennial travellers, particularly during peak travel seasons when airfare and accommodation prices surge (Biswas, 2023). Repeat visitors, however, may mitigate costs by leveraging prior knowledge of the destination, such as finding affordable dining options or selecting less-touristy areas for accommodation (Robinson & Schänzel, 2019). Exploring how Thai millennials balance cost considerations with their desire for unique experiences provides valuable insights for tourism marketers, especially in crafting promotional strategies targeted at budget-conscious travelers.

4. Social Influence

Social influence is a powerful determinant of travel behavior, especially among millennials who are deeply integrated into digital and social networks. The opinions and behaviors of peers, family members, influencers, and online communities shape tourists' perceptions and decisions, acting as a form of social validation (Wut et al., 2024). For Thai millennials, social media platforms like Instagram, Facebook, and YouTube are critical sources of travel inspiration, showcasing aesthetically appealing destinations and unique cultural experiences.

In the case of Japan, social influence plays a dual role: it attracts first-time visitors and reinforces the intentions of repeat travelers. Instagram-worthy locations such as Arashiyama Bamboo Grove, Nara's deer park, and Kyoto's traditional streets often dominate social media feeds, creating a strong desire to visit or revisit these iconic places. Travel vlogs and peer recommendations about less-explored areas like Hokkaido or Kyushu also inspire repeat visitors to seek novel experiences.

Social influence extends beyond digital platforms to include cultural norms and expectations. For instance, sharing travel experiences online or discussing trips with peers is a way for Thai millennials to build social currency. Research shows that this "fear of missing out" (FOMO) drives travel decisions, encouraging individuals to return to destinations where they had enjoyable experiences to rediscover and share new aspects (Pan et al., 2021; Solakis et al., 2024; Wut et al., 2024). However, while the role of social influence in shaping destination choice is well-documented, its specific impact on Thai millennials' decision-making process to revisit Japan remains underexplored.

5. Destination Accessibility

Destination accessibility refers to the ease with which tourists can reach and navigate a destination. Factors such as direct flights, efficient public transportation, and user-friendly infrastructure significantly influence destination choice and loyalty (Wang et al., 2020). Japan's accessibility, characterized by well-connected domestic transport networks and multilingual signage, makes it attractive to Thai travelers. Millennials, who often value convenience and time efficiency, are particularly influenced by accessibility when planning repeat visits. This construct also interacts with service quality, as seamless transport experiences reinforce positive perceptions of the destination (Gonda, 2021).

6. Cultural Familiarity

Cultural familiarity reflects tourists' comfort and understanding of a destination's cultural norms and practices (Lee-Anant et al., 2023). Exposure to Japanese culture through anime, food, and media has cultivated a sense of familiarity among Thai millennials, reducing cultural barriers and enhancing destination appeal (Guan et al., 2022; Tian et al., 2020). Familiarity not only motivates first-time visits but also encourages repeat visits, as tourists seek deeper engagement with local traditions and customs. This study explores how cultural familiarity interacts with travel motivation and emotional attachment to influence revisit intentions.

7. Emotional Attachment

Emotional attachment refers to the personal connection and sentimental value a tourist associates with a destination (Van-Dunem et al., 2021). Repeat visits are often driven by nostalgia and emotional satisfaction derived from past

experiences (Tavitiyaman et al., 2021; Zou et al., 2022). For Thai millennials, Japan's distinct ambiance, such as the serenity of temples or the joy of seasonal festivals, creates lasting memories that foster loyalty. Emotional attachment also strengthens the impact of other constructs, such as perceived destination image and service quality, in motivating tourists to revisit.

8. Environmental Factors

Environmental factors encompass natural beauty, cleanliness, and sustainability, which increasingly influence millennials' travel behavior. Japan's pristine landscapes, from the snowy mountains of Hokkaido to the serene beaches of Okinawa, are key attractions for Thai tourists. Additionally, the country's commitment to sustainable tourism enhances its appeal to environmentally conscious millennials (Tsai et al., 2020; Chakraborty et al., 2024). This construct highlights the growing importance of eco-friendly travel in fostering repeat visits.

9. Service Quality

Service quality includes the professionalism, reliability, and hospitality experienced by tourists during their visit (Maki et al., 2025; Jansri et al., 2020). Japan's reputation for exceptional customer service, well-maintained tourist attractions, and high-quality accommodations significantly influences revisit intentions (Kim et al., 2023). Positive service experiences not only enhance satisfaction but also build trust and loyalty, making tourists more likely to return (Liu et al., 2019). This study examines how service quality interacts with destination accessibility and emotional attachment in driving repeat visits.

10. Research Gaps and Conceptual Framework

Despite extensive research on factors influencing revisit intentions, existing studies often focus on individual constructs such as perceived destination image, travel motivation, travel cost, and social influence. These studies provide valuable insights but largely treat these factors in isolation, overlooking the interconnectedness of practical, emotional, cultural, and environmental dimensions. Such an approach limits the understanding of how these constructs interact to shape revisit behavior, particularly among millennials who demand holistic travel experiences.

Furthermore, little attention has been given to expanding traditional frameworks to include constructs that capture the evolving preferences of eco-conscious, experience-driven tourists.

Practical Constructs: Constructs like destination accessibility and service quality have often been underestimated in understanding revisit behavior. Accessibility encompasses the ease with which tourists can navigate the destination, from visa policies to transportation networks. Service quality, including the professionalism and hospitality of service providers, reinforces tourists' satisfaction and loyalty. These practical factors not only influence the feasibility of travel but also enhance emotional and cognitive evaluations of a destination, making them critical components of a revisit framework.

Emotional Constructs: Emotional attachment plays a pivotal role in motivating repeat visits, as tourists often develop sentimental bonds with destinations based on previous experiences. This connection is particularly relevant for destinations like Japan, where tourists may associate personal milestones, joy, or tranquility with specific cultural or natural elements. However, research on how emotional attachment interacts with perceived destination image and service quality is scarce, leaving a significant gap in the literature.

Cultural Constructs: Cultural familiarity provides a sense of comfort and connection for travelers, reducing uncertainty and fostering deeper engagement. For Thai millennials, the cultural affinity with Japan—shaped by shared consumption of Japanese media, cuisine, and traditions—enhances the likelihood of revisiting. Despite this, cultural familiarity is rarely studied as a standalone construct and is often embedded within broader destination image frameworks. This study seeks to explore its independent role and its interaction with other factors in shaping revisit intentions.

Environmental Constructs: With growing awareness of sustainability, environmental factors such as natural beauty, cleanliness, and eco-friendly tourism are becoming increasingly influential, particularly among millennials. Japan's commitment to preserving its natural landscapes and promoting sustainable practices appeals to eco-conscious tourists. However, the integration of environmental considerations into revisit intention models remains limited, particularly in contexts where natural and cultural elements coexist.

The hypotheses for this study explore the direct and mediated relationships between constructs influencing revisit intention among Bangkokian millennials traveling to Japan as shown in figure 1. It is hypothesized that H1: Perceived Destination Image (PDI) positively influences Revisit Intention (RI), emphasizing the role of favorable perceptions such as safety, cultural richness, and hospitality. Similarly, H2: Travel Motivation (TM) is expected to positively influence Revisit Intention, reflecting intrinsic drivers such as cultural exploration and relaxation. Conversely, H3: Travel Cost (TC) is hypothesized to negatively influence Revisit Intention, highlighting affordability concerns among millennial travelers. Additionally, H4: Social Influence (SI) is hypothesized to positively impact Revisit Intention, emphasizing the influence of recommendations from friends, family, and influencers. Practical enablers are also hypothesized to play a significant role, such as H5: Destination Accessibility (DA) positively influencing Revisit Intention, highlighting the importance of ease of travel and well-connected infrastructure. Similarly, H6: Environmental Factors (EF) are hypothesized to positively influence Revisit Intention, reflecting the appeal of natural beauty and eco-friendly practices. H7: Service Quality (SQ) is hypothesized to be a key predictor of Revisit Intention, reflecting the importance of hospitality and well-maintained facilities. H8: Cultural Familiarity (CF) is hypothesized to positively influence Revisit Intention, as familiarity with Japanese traditions and customs creates comfort and connection. Lastly, H9: Emotional Attachment (EA) is hypothesized to be the strongest predictor of Revisit Intention, reflecting nostalgia, meaningful memories, and personal connections.

In terms of mediated relationships, H10: Perceived Destination Image is hypothesized to influence Revisit Intention indirectly through Emotional Attachment, as positive perceptions foster emotional bonds that increase travel loyalty.

Similarly, H11: Service Quality is hypothesized to influence Revisit Intention indirectly via Emotional Attachment, reflecting the interplay between practical and emotional factors. H12: Social Influence is hypothesized to impact Revisit Intention indirectly through Cultural Familiarity, as social recommendations enhance cultural connection. Lastly, H13: Travel Motivation is hypothesized to positively influence Revisit Intention indirectly through Cultural Familiarity, as intrinsic motivations foster familiarity with the destination's culture. Figure 1 depicts the research framework and research hypotheses.

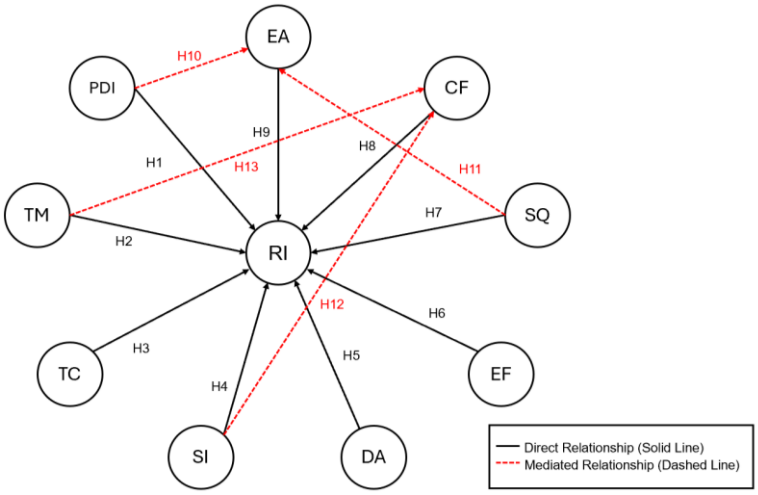


Figure 1. Research framework (Source: Own illustration)

RESEARCH METHODOLOGY

1. Research Design

This study employs a robust quantitative research design with cross-sectional data collection to investigate the factors influencing revisit intentions among Bangkokian millennial tourists to Japan during Thai public holidays. The quantitative approach was chosen for its ability to analyze relationships between constructs in the expanded conceptual framework, including perceived destination image, travel motivation, travel cost, social influence, destination accessibility, cultural familiarity, emotional attachment, environmental factors, service quality, and revisit intention. Cross-sectional data collection provides a snapshot of these factors at a single point in time, offering a comprehensive understanding of tourist behavior. The questionnaire for this study was meticulously crafted to align with the conceptual framework and ensure clarity for respondents. The study adheres to ethical standards, ensuring informed consent, respondent anonymity, and data confidentiality. The self-administered questionnaire was structured into two main sections to capture both background information and the constructs under investigation. The first section focused on demographics and travel behavior, collecting essential data such as age, gender, occupation, income level, travel frequency, and previous experiences visiting Japan. This information provided valuable insights into the respondents' profiles and their travel patterns, forming the basis for contextualizing the findings. The second section measured the constructs in the conceptual framework using a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). Each construct was operationalized through multiple items adapted from validated scales in previous studies, ensuring alignment with theoretical underpinnings.

The research tool underwent a rigorous verification process to ensure its reliability and validity. First, face validity was established by having three experts in tourism and behavioral research review the questionnaire. This review ensured that all items accurately measured the intended constructs and were relevant to the study objectives. Next, content validity was assessed by calculating a Content Validity Index (CVI) based on the experts' ratings. Items with a CVI score below 0.80 were either revised for clarity or removed to enhance the overall quality of the instrument. To further refine the questionnaire, pilot testing was conducted with a sample of 30 respondents from the target population. Feedback was collected to evaluate the clarity and coherence of the items, as well as the time required to complete the survey. Based on this feedback, minor adjustments were made to improve comprehension and eliminate potential ambiguities.

Through this comprehensive process, the questionnaire was validated as a reliable, culturally appropriate instrument for data collection. These measures ensured the quality and credibility of the data, laying a solid foundation for the subsequent analysis and interpretation of the findings. Figure 2 illustrates the methodology process diagram.

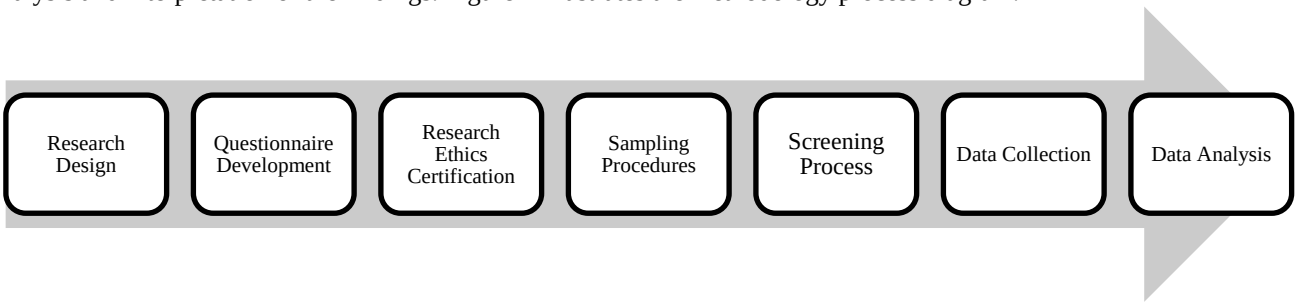


Figure 2. Research methodology process (Source: Own illustration)

2. Sampling

The target population for this study consists of Thai millennials born between 1981 and 1996, in line with generational classifications, and residing in Bangkok. These individuals must have previously travelled to Japan and expressed an intention to revisit during Thai public holidays. A sample size of 400 respondents was selected, adhering to the guidelines for Structural Equation Modelling (SEM) analysis, which recommend a minimum of 10–15 respondents per observed variable (Hair et al., 2019). Random sampling was employed to ensure a diverse representation of demographic and travel behavior characteristics. Participants were recruited through social media advertisements, travel blogs, and Japan-focused forums, targeting active travellers who aligned with the study's objectives. To ensure the relevance of the sample, a rigorous screening process was incorporated into the online survey. Potential respondents were required to answer a series of eligibility questions before accessing the main survey. These questions confirmed their city of residence (Bangkok), age range (born between 1981 and 1996), previous travel experience to Japan, and intentions to revisit Japan during Thai public holidays. Respondents who did not meet these criteria were excluded from the study. This meticulous approach ensured that the sample aligned with the research objectives, thereby enhancing the reliability and validity of the collected data.

3. Data Collection

Data collection was conducted over a three-month period through an online survey platform. Digital distribution channels, including social media and travel groups, were utilized to effectively reach the tech-savvy millennial demographic. The questionnaire link was disseminated through travel-related social media groups, Japan-focused forums, and influencers known for their expertise in Japan tourism. To ensure the quality and reliability of the data collected, several measures were implemented. All questions in the survey were mandatory to prevent missing data, ensuring a complete dataset. Validation checks were conducted to identify and eliminate duplicate or inconsistent responses, further enhancing the integrity of the data.

4. Data Analysis

Data analysis followed a systematic approach to examine the relationships among constructs within the conceptual framework. The first step involved conducting descriptive statistics to summarize basic demographic information, travel behavior, and the mean scores of constructs. This provided a comprehensive overview of the sample characteristics and helped contextualize the findings. Next, reliability and validity testing were performed to ensure the robustness of the measurement model. Cronbach's Alpha was calculated for each construct, with a threshold of 0.70 indicating acceptable internal consistency. Confirmatory Factor Analysis (CFA) was conducted to assess construct validity, which included two key components: Convergent Validity, measured by Average Variance Extracted (AVE) with a threshold of >0.50 to confirm that items effectively represented their constructs; and Discriminant Validity, assessed using the Fornell-Larcker criterion to ensure that constructs were distinct from one another.

The final step involved employing Structural Equation Modelling (SEM) to test the hypothesized relationships among the constructs. Model fit indices were used to evaluate the goodness-of-fit of the structural model, with acceptable thresholds including Comparative Fit Index (CFI) > 0.90, Root Mean Square Error of Approximation (RMSEA) < 0.08, and Standardized Root Mean Square Residual (SRMR) < 0.08. Path analysis was performed to examine regression coefficients and significance levels, providing insights into the strength and direction of the relationships between variables. Data analysis was conducted using SPSS for descriptive statistics and reliability testing, while AMOS was utilized for CFA and SEM to ensure a comprehensive examination of the framework.

5. Reliability and Validity Testing

The reliability and validity of the measurement model were thoroughly assessed to ensure the robustness of the constructs. Reliability was evaluated using Cronbach's Alpha, which measures internal consistency. All constructs demonstrated high reliability, with Cronbach's Alpha values exceeding the commonly accepted threshold of 0.70. For instance, Service Quality exhibited excellent reliability (α=0.92), indicating consistent responses to items related to Japan's hospitality and services, while Emotional Attachment displayed strong reliability (α=0.88), reflecting the consistency of respondents' emotional connections to Japan. These high values confirm that the items within each construct were internally consistent and accurately measured their theoretical dimensions. Validity was examined through both convergent and discriminant validity tests. Convergent validity was assessed using Average Variance Extracted (AVE), with all constructs achieving AVE values above the recommended threshold of 0.50. For example, Perceived Destination Image had an AVE of 0.62, and Revisit Intention achieved an AVE of 0.67, confirming that the observed variables strongly correlated with their respective latent constructs. Discriminant validity was tested using the Fornell-Larcker criterion, which compares the square root of each construct's AVE to its correlations with other constructs. The results demonstrated that the square root of the AVE for each construct was greater than its correlations with other constructs, ensuring that the constructs were distinct. For instance, the square root of the AVE for Travel Motivation (0.74) exceeded its correlation with Social Influence (0.68) and Cultural Familiarity (0.62), confirming clear differentiation among the constructs.

Additionally, the research instrument underwent pilot testing with 30 respondents from the target population to ensure clarity, cultural appropriateness, and alignment with the conceptual framework. Based on feedback, minor adjustments were made to improve the clarity of certain items. The results of these assessments provide robust evidence that the measurement model is both reliable and valid. The constructs demonstrated strong internal consistency, effectively measured their intended dimensions, and remained distinct from one another, ensuring the quality and robustness of the data for further analysis, including Structural Equation Modelling (SEM).

RESULTS

1. Demographic Profile of Respondents

The respondent profile, as shown in Table 1, provided a comprehensive view of Bangkokian millennials who previously visited Japan, reflecting a diverse and dynamic group with strong intentions to revisit during Thai public holidays.

Table 1. Respondent profiles (Source: Research findings)

Demographics	Description	Number	Percentages (%)
Gender	Male	191	47.8
	Female	209	52.2
Age	27-30	89	22.3
	31-34	97	24.3
	35-38	113	28.3
	39-42	101	25.3
Education	Under high school	28	7.0
	High school diploma	61	15.3
	First degree	173	43.3
	Masters	116	29.0
	Above masters	22	5.5
Monthly Income	Under THB 15,000	77	19.3
	15,001-25,000	123	30.8
	25,001-35,000	99	24.8
	35,001-45,000	52	13.0
	45,001-55,000	29	7.3
	Over THB 55,001	20	5.0
Occupation	Student	49	12.3
	Employee	157	39.3
	Self-employed	121	30.3
	Public service	43	10.8
	Unemployed	30	7.5
Marital Status	Single	218	54.5
	In relationship	141	35.3
	Married	31	7.8
	Separated/Divorced	10	2.5
Travel Frequency	Once	49	12.3
	Twice	81	20.3
	Three times	119	29.8
	Four times	83	20.8
	Five times	42	10.5
	Over five times	26	6.5
Travel Method	Self-administered	237	59.3
	Tour Group	163	40.8
Travel Companion	Single	83	20.8
	Family	138	34.5
	Friends/Couples	157	39.3
	Business Associates	22	5.5

The sample comprised 400 Bangkokian millennials aged 27–42, born 1981-1996 as of 2023, who resided in Bangkok, had previously traveled to Japan and intended to revisit during Thai public holidays. Gender distribution was relatively balanced, with 52.2% female and 47.8% male respondents, ensuring diverse perspectives.

The largest age group was 35–38 years (28.3%), followed by 39–42 years (25.3%), 31–34 years (24.3%), and 27–30 years (22.3%), highlighting a mix of younger adventurers and more experienced travelers with established habits and disposable incomes. Education levels revealed that 43.3% of respondents held a first degree, 29.0% a master's degree, and 7.0% had education below high school, while 5.5% had education above the master's level, reflecting a well-educated sample likely to seek cultural and intellectual travel experiences. Monthly income ranged from under THB 15,000 (19.3%) to over THB 55,001 (5.0%), with the majority earning between THB 15,001–25,000 (30.8%) or THB 25,001–35,000 (24.8%), indicating varied spending capacities and the need for flexible travel packages. Most respondents were employees (39.3%) or self-employed (30.3%), with smaller proportions of students (12.3%), public service workers (10.8%), and unemployed individuals (7.5%), showcasing a mix of stable incomes and entrepreneurial flexibility. Marital status data indicated that 54.5% were single, 35.3% in relationships, and 7.8% married, suggesting a dominance of single and coupled travellers focused on social and exploratory experiences, with some family-oriented groups.

Travel frequency varied, with 29.8% having visited Japan three times, 20.8% four times, and 6.5% more than five times, reflecting a mix of destination loyalty and emerging repeat visitors. Travel method preferences showed 59.3% preferred self-administered trips for independence, while 40.8% opted for tour groups, indicating a demand for both customizable and structured travel options. Most respondents traveled with friends or partners (39.3%) or family

(34.5%), while 20.8% traveled solo, highlighting the social nature of travel among millennials and the emerging market for individual-focused travel experiences. This diverse demographic profile underscores the varied motivations and preferences of Bangkokian millennials, offering valuable insights for developing targeted tourism strategies.

2. Descriptive Statistics

The descriptive statistics provide valuable insights into respondents' perceptions of the key constructs in the study, reflecting their attitudes and preferences toward revisiting Japan.

Mean scores and standard deviations for each construct, as presented in the Table 2, reveal varying levels of agreement, offering a nuanced understanding of the factors influencing revisit intentions.

Table 2. Descriptive analysis of constructs and survey items (Source: Research findings)

Constructs	Questions	Mean	Std. Deviation
Perceived Destination Image	Japan offers a safe and welcoming environment for tourists.	4.35	0.62
	Japan is culturally rich and diverse.	4.25	0.65
	Japan provides a peaceful and safe atmosphere.	4.36	0.62
	Japan offers a wide variety of cultural experiences.	4.38	0.60
	Japan is clean and well-maintained.	4.40	0.58
	Japan is a highly organized travel destination.	4.42	0.57
	Total	4.36	0.60
Travel Motivation	I am motivated to revisit Japan to explore its culture.	4.22	0.68
	I want to revisit Japan for relaxation and enjoyment.	4.15	0.70
	I am eager to explore new attractions in Japan.	4.28	0.68
	I am motivated by Japan's unique festivals and events.	4.25	0.70
	I wish to revisit Japan to experience its traditional lifestyle.	4.20	0.72
	I find traveling to Japan to be adventurous.	4.18	0.74
	Total	4.21	0.70
Travel Cost	Travel to Japan offers good value for money.	3.80	0.73
	Travel expenses for Japan are affordable for me.	3.75	0.75
	Traveling to Japan is cost-effective compared to other destinations.	3.85	0.72
	The cost of food and accommodations in Japan is reasonable.	3.78	0.74
	Japan offers good deals for international travelers.	3.70	0.76
	The overall travel cost to Japan fits my budget.	3.68	0.78
	Total	3.76	0.74
Social Influence	Recommendations from friends influence my intention to revisit Japan.	4.10	0.65
	Social media impacts my decision to revisit Japan.	4.05	0.68
	My family recommends revisiting Japan.	4.15	0.66
	My favorite influencers frequently post about Japan.	4.08	0.67
	Reviews from online travel communities encourage me to revisit Japan.	4.12	0.64
	Positive feedback about Japan influences my decision to return.	4.09	0.63
	Total	4.09	0.65
Destination Accessibility	Japan is easy to navigate as a foreign tourist.	4.40	0.58
	Japan has efficient transportation systems.	4.38	0.60
	Japan provides clear signage and easy communication for tourists.	4.45	0.55
	Japan's airports and train systems are tourist-friendly.	4.43	0.57
	Traveling within Japan is hassle-free.	4.48	0.53
	The public transport system in Japan is well-connected and reliable.	4.50	0.51
	Total	4.44	0.55
Environmental Factors	Japan's natural beauty motivates me to revisit.	4.28	0.61
	Japan's seasonal attractions add to its appeal.	4.32	0.63
	Japan's environmental policies enhance its appeal.	4.33	0.59
	Japan's landscapes are perfect for photography.	4.30	0.61
	Japan's parks and natural reserves are highly appealing.	4.35	0.62
	Japan's commitment to sustainability makes it more attractive.	4.36	0.60
	Total	4.32	0.61
Service Quality	Hotels and accommodations in Japan provide excellent service.	4.50	0.55
	Customer service in Japan exceeds my expectations.	4.48	0.57
	Japanese restaurants provide excellent dining experiences.	4.52	0.53
	Hotels in Japan offer exceptional value for money.	4.50	0.55
	Service staff in Japan are highly professional and friendly.	4.53	0.52
	Tourist facilities in Japan are well-maintained and accessible.	4.55	0.50
	Total	4.51	0.53
Cultural Familiarity	Japanese culture is familiar and easy to understand.	4.15	0.60
	I feel comfortable engaging with Japanese customs.	4.10	0.62
	I find Japanese traditions easy to appreciate.	4.20	0.58
	Japanese entertainment (e.g., anime, music) makes me feel connected.	4.18	0.60

Constructs	Questions	Mean	Std. Deviation
	I am familiar with Japan's cultural festivals and events.	4.22	0.59
	I understand Japan's social norms and practices.	4.25	0.57
	Total	4.18	0.59
Emotional Attachment	I have a personal connection to Japan based on my previous visits.	4.30	0.63
	Visiting Japan evokes positive emotions for me.	4.25	0.65
	I feel nostalgic thinking about my experiences in Japan.	4.35	0.62
	I feel a sense of belonging when I am in Japan.	4.32	0.64
	I associate Japan with meaningful memories.	4.38	0.61
	Japan holds sentimental value for me due to past visits.	4.40	0.60
	Total	4.33	0.62
Revisit Intention	I plan to revisit Japan during public holidays within the next year.	4.42	0.59
	I strongly intend to revisit Japan in the near future.	4.40	0.60
	I am likely to recommend Japan to others based on my experiences.	4.50	0.51
	Japan is my top choice for my next international trip.	4.48	0.53
	I would prefer Japan over other destinations for my holidays.	4.45	0.54
	I often think about revisiting Japan.	4.47	0.56
	Total	4.45	0.55

The table provides valuable insights into respondents' perceptions of the constructs influencing revisit intentions to Japan. For Perceived Destination Image, the summary mean score of 4.36 indicates strong agreement with statements highlighting Japan's cultural richness, safety, cleanliness, and organization. The low standard deviation (SD = 0.61) reflects consistent perceptions among respondents about Japan's positive image as a travel destination. Similarly, Travel Motivation scored a mean of 4.21, with respondents expressing strong motivation driven by cultural exploration, relaxation, and adventure. However, a slightly higher variability (SD = 0.70) suggests a broader range of opinions, possibly reflecting diverse personal motivations. For Travel Cost, the mean score of 3.76 indicates moderate agreement, suggesting affordability could be a potential concern for some respondents. The higher standard deviation (SD = 0.75) highlights varying perceptions, with some finding Japan affordable while others perceive it as expensive. Conversely, Social Influence achieved a mean of 4.10, indicating that recommendations from friends, family, and social media play a significant role in revisit intentions. The moderate standard deviation (SD = 0.66) suggests relative consistency in recognizing external endorsements' importance in decision-making.

Destination Accessibility was one of the highest-rated constructs, with a mean of 4.44, emphasizing Japan's efficient transportation systems and tourist-friendly infrastructure as key enablers of positive travel experiences. The low variability (SD = 0.55) indicates strong consensus on this factor. Similarly, Environmental Factors scored a high mean of 4.32, reflecting respondents' appreciation of Japan's natural beauty, seasonal attractions, and sustainability efforts. The low standard deviation (SD = 0.62) shows broad agreement on the importance of environmental factors.

Service Quality emerged as the highest-rated construct, with a mean of 4.51, highlighting respondents' strong appreciation for Japan's exceptional hospitality, professional services, and well-maintained facilities. The low variability (SD = 0.55) reflects near-unanimous agreement among respondents. For Cultural Familiarity, the mean score of 4.18 suggests respondents feel comfortable and connected with Japanese culture, traditions, and social norms. This construct's relatively low variability (SD = 0.60) reinforces its role in enhancing comfort and engagement during repeat visits.

Emotional Attachment also scored highly, with a mean of 4.33, suggesting respondents have formed strong emotional bonds with Japan, driven by nostalgia, positive memories, and personal connections. The low standard deviation (SD = 0.63) reinforces its critical role in motivating revisit intentions. Finally, Revisit Intention scored among the highest with a mean of 4.46, indicating strong enthusiasm and likelihood of returning to Japan. The low variability (SD = 0.55) demonstrates consistent intent across respondents, validating Japan's appeal as a preferred repeat travel destination.

In summary, the highest-scoring constructs - Service Quality (4.51), Destination Accessibility (4.44), and Revisit Intention (4.46)—highlight the practical and emotional factors that drive loyalty to Japan. However, Travel Cost (3.76) scored the lowest, reflecting potential barriers for cost-sensitive travelers. Constructs like Service Quality, Destination Accessibility, and Perceived Destination Image displayed low variability, indicating consensus among respondents, while constructs like Travel Cost and Travel Motivation showed higher variability, pointing to diverse preferences. These results emphasize the importance of maintaining high service standards, promoting accessibility, and addressing affordability concerns to attract repeat visitors effectively.

3. The Research Model

The research model, illustrated in Figure 3, provided significant insights into the direct and mediated relationships among constructs influencing revisit intention, identifying key drivers for repeat visits to Japan among Bangkokian millennials. Perceived Destination Image ($\beta=0.30$, $p<0.001$, $f^2=0.09$) as a strong predictor with a medium-to-large effect size, emphasizing the importance of favorable perceptions regarding safety, cultural richness, and hospitality.

Similarly, Travel Motivation ($\beta=0.29$, $p<0.001$, $f^2=0.08$) was a notable factor with a medium effect size, highlighting intrinsic drivers such as the desire for cultural exploration, relaxation, and unique experiences. Conversely, Travel Cost ($\beta=-0.12$, $p<0.05$, $f^2=0.02$) negatively influenced revisit intention, with a small effect size reflecting affordability concerns and the importance of value-driven offerings for cost-sensitive travelers.

Social Influence (β=0.24, p<0.001, f^2=0.07) demonstrated the power of recommendations from friends, family, and influencers in shaping travel decisions, underscoring the role of word-of-mouth and social proof. Practical enablers such as Destination Accessibility (β=0.38, p<0.001, f^2=0.13) and Environmental Factors (β=0.32, p<0.001, f^2=0.10) significantly influenced revisit intention, with medium-to-large effect sizes highlighting the appeal of well-connected infrastructure, natural beauty, and eco-friendly practices. Among practical factors, Service Quality (β=0.43, p<0.001, f^2=0.15) was the strongest predictor, exhibiting a large effect size and reflecting Japan's exceptional hospitality and well-maintained tourist facilities. On the emotional and cultural dimensions, Cultural Familiarity (β=0.20, p<0.001, f^2=0.06) and Emotional Attachment (β=0.44, p<0.001, f^2=0.16) were significant predictors, with Emotional Attachment emerging as the most influential construct with a large effect size. This finding underscores the critical role of nostalgia, meaningful memories, and personal connections in driving repeat visits.

Mediated relationships amplified these effects, revealing the nuanced pathways through which constructs interact. For example, Perceived Destination Image indirectly influenced revisit intention through Emotional Attachment (β=0.20, p<0.01, f^2=0.05), demonstrating how positive perceptions foster emotional bonds that drive loyalty. Similarly, Service Quality strengthened emotional connections that further shaped revisit intentions (β=0.25, p<0.01, f^2=0.06). Additionally, Social Influence indirectly affected revisit intention via Cultural Familiarity (β=0.15, p<0.05, f^2=0.03), while Travel Motivation enhanced revisit intention through its impact on Cultural Familiarity (β=0.13, p<0.05, f^2=0.02).

In conclusion, this analysis underscores the multidimensional nature of revisit intentions, driven by emotional, practical, cognitive, and social factors. Constructs like Emotional Attachment and Service Quality emerged as dominant predictors, with mediated effects through Cultural Familiarity and Emotional Attachment highlighting the intricate interplay of these constructs. These findings provide actionable insights for tourism stakeholders, enabling the development of targeted strategies that ensure Japan remains a compelling destination for repeat visitors. By addressing key factors with varying effect sizes, stakeholders can craft nuanced campaigns to attract and retain loyal millennial travelers.

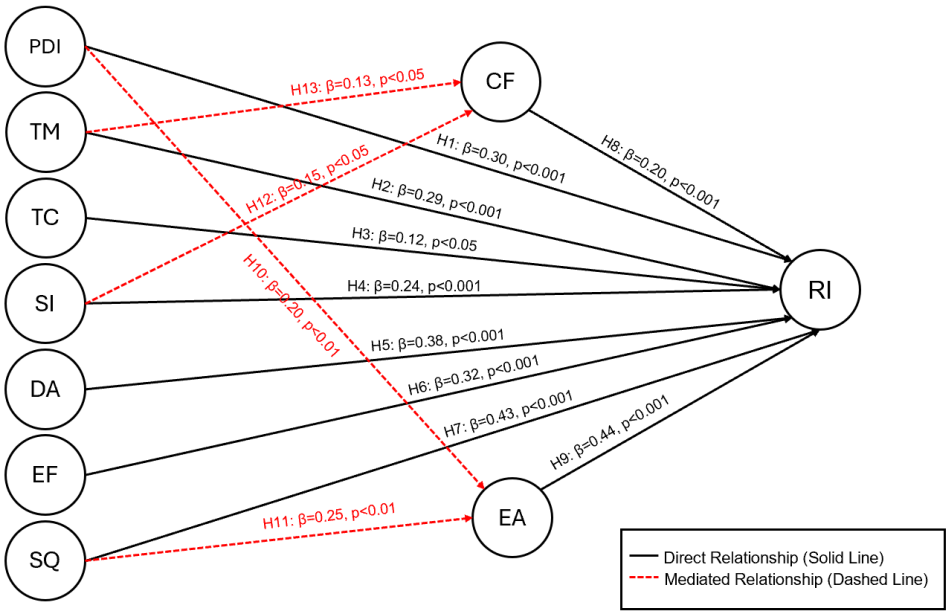


Figure 3. The research model (Source: Research Findings)

The SEM analysis provided a comprehensive examination of the relationships within the conceptual framework and demonstrated a well-fitting model, with all fit indices, shown in **Table 3**, meeting recommended thresholds. These results confirm the robustness of the proposed model in explaining the factors influencing revisit intentions to Japan.

Table 3. Model fit indices (Source: Research Findings)

Fit Index	Value	Threshold	Interpretation
χ2/df (Chi-Square/Degrees of Freedom)	2.05	< 3.0	Good balance between model complexity and data fit
CFI (Comparative Fit Index)	0.95	> 0.90	Excellent fit between the observed and hypothesized models
RMSEA (Root Mean Square Error of Approximation)	0.05	< 0.08	Close approximation of model to the data
SRMR (Standardized Root Mean Square Residual)	0.04	< 0.08	Minimal residual variance between observed and predicted relationships

DISCUSSION

1. Theoretical Implications

The findings of this study contribute significantly to the theoretical understanding of millennial travel behavior, particularly within the framework of the push-pull model of tourist behavior. This model posits that travel decisions are influenced by intrinsic motivations (push factors) and extrinsic destination attributes (pull factors) (Suni & Pesonen, 2019; Duong et al., 2023). The study's results validate this framework and extend it by incorporating constructs such as

emotional attachment, cultural familiarity, and destination accessibility, which highlight the interplay of cognitive, emotional, and practical dimensions in driving revisit intentions.

The strong influence of pull factors such as Perceived Destination Image, Cultural Familiarity, and Service Quality aligns with previous research emphasizing the importance of destination attributes in shaping tourist loyalty. For example, Afshardoost & Eshaghi (2020) and Nguyen Viet et al., 2020 demonstrated that a positive destination image fosters emotional connections and strengthens revisit intentions, a finding supported by this study's results. Similarly, the role of cultural familiarity in bridging cognitive and affective dimensions of decision-making mirrors the findings of Nazarian et al. (2024), who highlighted how prior exposure to a destination's culture reduces barriers and enhances tourist satisfaction.

In terms of push factors, the significant influence of Travel Motivation reflects findings by Ketter (2020), who emphasized the role of cultural exploration and personal growth in millennial travel behavior. The dual appeal of Japan as a destination for both adventure and relaxation resonates with Kim & Park's (2020) insights into millennials' preferences for multifaceted travel experiences. Moreover, the study's focus on Emotional Attachment as a direct and mediating factor aligns with Tsai et al.(2022), which identified nostalgia and meaningful memories as critical drivers of tourist loyalty.

The mediating roles of emotional attachment and cultural familiarity add depth to the push-pull model by highlighting the pathways through which destination attributes influence revisit intentions. For instance, the finding that emotional attachment mediates the effects of perceived destination image and service quality aligns with Zhang et al. (2021), who demonstrated that cognitive impressions transform into affective bonds that drive loyalty. Similarly, the mediating role of cultural familiarity in enhancing the impact of social influence and travel motivation echoes the work of Cho (2021) and Suni & Pesonen (2019), who emphasized the importance of cultural alignment in fostering repeat visits.

The negative influence of Travel Cost on revisit intentions is consistent with Jang et al. (2019), who noted that cost-sensitive millennials often weigh affordability against the perceived value of experiences. This study reaffirms that while millennials prioritize meaningful and emotional experiences, financial constraints remain a critical consideration, particularly during repeat visits. Future studies could explore strategies to mitigate these barriers through value-driven offerings and promotional campaigns.

In advancing tourism theory, this study bridges gaps by integrating cognitive, emotional, and practical constructs into the push-pull framework, offering a holistic perspective on millennial travel behavior. The findings underscore the interconnectedness of these dimensions and highlight the need for theoretical models to consider mediating constructs, such as emotional attachment and cultural familiarity, to better capture the complexities of tourist decision-making.

2. Practical Implications

The findings provide actionable insights for tourism stakeholders in Japan to enhance their strategies for attracting and retaining Thai millennial tourists. The strong influence of emotional attachment and service quality underscores the need for experiential and personalized marketing approaches. Prior research has similarly highlighted the importance of emotional connections in driving loyalty. For instance, Tsai et al. (2020) emphasize that marketing campaigns that evoke nostalgia and meaningful memories can effectively strengthen emotional bonds with repeat visitors.

The role of cultural familiarity in fostering revisit intentions aligns with Nazarian et al.'s (2024) findings on cultural comfort. This suggests that tourism marketers should promote Japanese cultural elements that resonate with Thai millennials, such as anime, food, and traditional customs. The use of social media platforms for this purpose reflects the importance of digital engagement noted by Wut et al. (2024), who found that peer recommendations and influencer campaigns significantly shape travel decisions.

The negative influence of travel cost, while moderate, highlights the importance of value-driven strategies. Jang et al. (2019) noted that affordable travel packages and promotional discounts could mitigate cost concerns, particularly for repeat visitors. Offering exclusive loyalty programs and seasonal discounts could also align with millennials' preference for value-for-money experiences, as supported by Biswas (2023) and Poon (2021).

Additionally, the study's emphasis on destination accessibility aligns with Wang et al. (2020) and Nguyen (2021), who noted that seamless infrastructure and convenience significantly enhance tourist satisfaction and repeat visitation. Promoting Japan's well-connected transport networks and user-friendly digital tools could further strengthen its appeal.

Finally, the findings on environmental factors underscore the growing importance of sustainability in tourism marketing. Millennials' increasing preference for eco-conscious travel mirrors the insights of Chakraborty et al. (2024), who found that promoting sustainable practices enhances destination appeal. Highlighting Japan's commitment to environmental conservation and offering eco-tourism packages could attract environmentally conscious millennial travelers, fostering long-term loyalty.

CONCLUSION & RECOMMENDATIONS

1. Conclusion

This study offers profound insights into the factors influencing revisit intentions among Bangkokian millennial tourists to Japan, presenting a multidimensional framework that blends emotional, cognitive, and practical drivers. By integrating constructs such as perceived destination image, travel motivation, travel cost, social influence, destination accessibility, cultural familiarity, emotional attachment, environmental factors, and service quality, this research pushes the boundaries of traditional tourism models. The findings reveal that emotional attachment, service quality, and destination accessibility are dominant predictors of revisit intentions, highlighting the importance of building personal connections, providing exceptional experiences, and ensuring seamless travel.

Constructs like cultural familiarity and perceived destination image amplify these effects, underscoring the interplay between cultural resonance and cognitive perceptions. While travel cost emerged as a moderate barrier, its impact underscores the importance of offering value-driven solutions for cost-sensitive millennials.

By extending the push-pull model with emotional and cultural dimensions, this study not only contributes to academic discourse but also provides a roadmap for stakeholders to transform theoretical insights into impactful strategies. This research is a call to action for the tourism industry to go beyond the ordinary, crafting experiences that inspire loyalty and foster sustainable growth in one of the most dynamic market segments - millennial travelers.

2. Recommendations

The findings offer a roadmap for tourism stakeholders in Japan to craft innovative strategies that enhance destination loyalty among Thai millennial tourists. By addressing emotional, cultural, and practical dimensions, these recommendations aim to make Japan not only a desirable destination but a recurring choice for millennial travelers.

2.1. Leverage Emotional Resonance to Strengthen Loyalty

Emotional attachment is a key driver of revisit intentions, making it essential to create campaigns that tap into nostalgia and sentimentality. Personalized marketing, such as digital postcards featuring past visits or curated itineraries based on prior experiences, can evoke strong emotional connections. Highlighting the unique ambiance of Japan's iconic attractions alongside hidden gems can inspire both familiarity and novelty, encouraging repeat visits. Story-driven content, especially in video formats, can vividly showcase the joy and meaningful memories tied to exploring Japan.

2.2. Redefine Cultural Engagement with Authenticity

Cultural experiences are at the heart of millennials' travel preferences. To capture this market, tourism campaigns should focus on promoting Japan's authentic cultural elements - traditional festivals, tea ceremonies, and regional crafts. Collaborations with influencers who can authentically present these experiences on platforms like TikTok, Instagram, and YouTube can amplify reach. For repeat visitors, offering exclusive cultural immersion opportunities, such as rural homestays or behind-the-scenes access to artisans, can deepen their engagement and satisfaction.

2.3. Address Cost Sensitivities with Value-Driven Solutions

Although millennials prioritize experiences, cost remains a significant consideration. Introducing value-for-money travel packages that include transportation, accommodations, and curated activities can mitigate affordability concerns. Special promotions during Thai public holidays or discounts for group travelers can further attract this demographic. Loyalty programs offering repeat visitors exclusive perks - such as access to VIP experiences or discounted regional travel passes - can strengthen their commitment to Japan as a preferred destination.

2.4. Highlight Accessibility as a Competitive Advantage

Japan's well-developed infrastructure is a major pull factor for millennials who value convenience and time efficiency. Marketing campaigns should emphasize features like multilingual signage, user-friendly travel apps, and seamless public transport systems. Tailored travel guides in Thai can make the planning process easier and more accessible for Bangkokian tourists. Highlighting the connectivity of less-explored regions, such as Kyushu or Shikoku, can encourage adventurous travelers to explore beyond the typical tourist hubs.

2.5. Promote Sustainability to Appeal to Eco-Conscious Millennials

With millennials increasingly valuing environmentally responsible travel, Japan can position itself as a leader in sustainable tourism. Campaigns should emphasize eco-friendly initiatives, such as green-certified accommodations, conservation programs, and low-impact travel options like electric rail networks. Nature-based itineraries focusing on Japan's pristine landscapes, cherry blossom trails, and national parks can cater to this audience while showcasing the country's commitment to sustainability.

2.6. Reinvent Experiences for Repeat Visitors

Repeat visitors often seek novelty and deeper cultural immersion. Marketing strategies should cater to this by promoting lesser-known attractions, niche experiences, and regional specialties. For example, offering culinary tours focusing on local delicacies, or adventure packages in rural areas, can provide the uniqueness and authenticity that repeat visitors crave. Personalized recommendations based on their previous trips can make these experiences even more appealing.

2.7. Maximize Digital Engagement to Influence Decision-Making

Social media is central to millennial travel behavior, making it a powerful tool for engagement. Creating interactive campaigns, such as travel challenges, user-generated content contests, and polls, can boost visibility and inspire revisit intentions. Collaborations with Thai influencers and travel bloggers can enhance authenticity and trust.

Real-time content, such as live streams from festivals or destination highlights, can create a sense of urgency and excitement among potential travelers.

2.8. Maintain and Elevate Service Excellence

Japan's reputation for exceptional hospitality and service quality is a cornerstone of its appeal. Maintaining high standards

across all touchpoints, from accommodations to transportation, reinforces positive perceptions. Tourism authorities can collaborate with local businesses to provide training programs that uphold Japan's reputation for professionalism and warmth. Highlighting these efforts in marketing campaigns can assure travelers of consistently excellent experiences.

3. Limitations and Future Research

While this study provides valuable insights into Bangkokian millennial tourists' revisit intentions to Japan, it also opens avenues for further exploration. The cross-sectional design offers a robust snapshot of travel behavior, but future research could enrich these findings by adopting longitudinal approaches to examine changes over time. Expanding the focus beyond Bangkok millennials to include other regions or international comparisons would provide a more holistic understanding of revisit behavior. Although online surveys effectively captured tech-savvy millennials, incorporating diverse data collection methods could enhance depth and diversity. Future studies might also explore emerging factors such as social media engagement, health-related concerns, or environmental consciousness, offering additional dimensions to this dynamic research area. Comparative research across cultural contexts could further validate and refine the findings, contributing to a richer global understanding of millennial travel behavior.

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WHAT AFFECTS REVISIT INTENTION AND WORD OF MOUTH AT INTERNATIONAL ETHNO-FEST? AN EXPERIENCE APPROACH IN KYRGYZSTAN

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Abstract: This study examines the key factors influencing revisit intentions (IR) and word-of-mouth (WOM) behaviors among tourism professionals attending international ethno-festivals in Kyrgyzstan, with a specific focus on the 2023 Bishkek Ethno-Festival. While much of the existing literature focuses predominantly on visitor experiences, this study fills a notable gap by analyzing the perspectives of tourism operators and managers, who play a crucial role in ensuring the sustainability and long-term success of such events. In doing so, the research shifts attention to an often-overlooked stakeholder group whose experiences and perceptions are essential for the effective management and promotion of ethno-festivals. The study investigates how Festival Image (FI), Perceived Value (PV), and Festival Loyalty (FL) impact Festival Satisfaction (FS) and, subsequently, IR and WOM. Data were collected from tourism professionals attending the festival, and SPSS and AMOS were used to analyze both direct and indirect relationships between these key variables, ensuring a robust and comprehensive statistical validation of the proposed model. Findings indicate that FI and PV significantly enhance FS, which, in turn, strengthens loyalty (FL), increases the likelihood of revisits (IR), and encourages positive WOM behaviors. These results highlight the critical importance of effective festival branding, perceived quality, and visitor engagement strategies in fostering continued participation and favorable perceptions among industry professionals. Furthermore, the study reveals that the perceived authenticity and cultural richness of the festival play a mediating role in strengthening satisfaction and loyalty. The results emphasize that improving festival identity, perceived value, and visitor experiences can significantly contribute to the economic, social, and cultural sustainability of festival tourism. This research provides practical recommendations for event organizers, policymakers, and tourism businesses, ensuring that ethno-festivals serve not only as celebratory events but also as effective platforms for cultural exchange, economic development, and enhanced destination competitiveness in Kyrgyzstan and beyond. Overall, this study underscores the pivotal role of tourism professionals in the ecosystem of cultural festivals and highlights the strategic importance of their satisfaction and loyalty for the future viability of such events.

Keywords: tourism, festival, ethno-fest, festival satisfaction, intention on revisit, perceived value, Word-of-Mouth (WOM), Festival Loyalty

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INTRODUCTION

Changes in tourist expectations over time have changed the tourism sector itself, resulting in the emergence of its various types. It has become inevitable to generate different events in order to meet these expectations. Festivals that have a great impact on economic, social and cultural aspects (Getz, 2002) offer huge opportunities for tourism businesses to turn into strategically advantageous sector in an increasingly competitive world (Wood, 2018). In general, festivals are effective in upholding traditions of a society and maintaining sustainable tourism (Yoon et al., 2010). Moreover, the festivals are effective in conveying the culinary culture, eating and drinking habits of a region or a society, as well as the characteristic features and dishes of particular destinations (Cohen & Avieli, 2004), as well as in preserving food diversity and supporting local businesses. They are also important in the formation of the regional identity and sustainability of tourism sector (Kalkstein-Silkes et al., 2008; Van Keken & Go, 2006).

This study is significant as it uncovers the intentions (IR) and word-of-mouth (WOM) marketing interests of tourism professionals attending ethno-festivals. Festivals have become some kind of events, the popularity of which is increasing day

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by day, as in Kyrgyzstan so as in other parts of the world, as well (Penpece, 2014). Although there have been conducted some research and surveys in this field, on the sustainability of such festivals, in particular (Chang et al., 2018; Vesci & Botti, 2019), there is still an insufficiency of studies in the field of tourism in Kyrgyzstan. However, the sustainability of festivals is as important as the enjoyment of visitors, thus, their contribution to the destination. In particular, studies on the IR and WOM effects of visitors are insufficient to ensure the sustainability of festivals that are very important events in tourism. This study aims to fill the gap in the literature regarding the sustainability of international ethno-festivals in Kyrgyzstan. While the existing body of literature provides valuable insights into visitor satisfaction, festival attributes, and sustainability, there remains a notable gap in understanding these dynamics from the perspective of tourism professionals.

This study addresses this gap by investigating how Festival Image (FI), Perceived Value (PV), and Festival Loyalty (FL) influence Festival Satisfaction (FS), Intent to Revisit (IR), and WOM in the context of international ethno-festivals, with a specific focus on the Bishkek ethno-festival in Kyrgyzstan. Unlike previous research, which predominantly centers on visitor experiences, this study emphasizes the role of tourism professionals, offering a unique perspective on festival management and sustainability strategies. By examining the direct and indirect effects of FI, PV, and FL on FS and its subsequent influence on IR and WOM, the research aims to contribute to the theoretical and practical understanding of how festivals can be leveraged to enhance destination attractiveness and support sustainable tourism development.

This study not only builds upon the foundational work of previous scholars but also fills an important gap in the literature by shifting the focus to the operators' perspective. This approach provides a more holistic understanding of the mechanisms driving festival success and sustainability, offering actionable insights for improving festival design, management, and marketing strategies. Furthermore, by situating the research within the context of an international ethno-festival, the study adds to the growing discourse on the global relevance of cultural events in promoting sustainable tourism.

LITERATURE REVIEW

1. Concept and scope of festival

Festivals are a universal social phenomenon present in nearly every human culture, often described by Falassi (1987) "*a sacred or profane time of celebration, marked by special observances.*" According to Getz (2005), festivals can be categorized across various event types based on their scale and significance. They range from small, community-based gatherings like neighborhood festivals to regional events, and even large-scale, internationally recognized occasions such as hallmark or mega events. These larger festivals, like the Cannes Film Festival or Woodstock, often draw attendees from across the nation or abroad. Historically, festivals have been integral to human culture, often tied to religious practices—ranging from ancient beliefs such as animism, shamanism, and totemism to modern world religions, like Christian festivals. As an expression of intangible cultural heritage, festivals showcase art, traditions, and symbolic cultural practices (Cudny, 2016).

The concept of "festival" has been used for hundreds of years. According to Green (1997), etymologically, it originates from the Latin word "festum" which means folk entertainment, joy and festivity. It is defined literally as "an art show of special importance where the time or season, the environment in which it is held, its quality or the number of participants is specified in the program" (İmirgi, 2005). The term itself means any kind of cultural, artistic and social events organized periodically by a local community which symbolizes the definite region, to celebrate a unique value of society or to commemorate an event or a person (McKercher et al., 2006; Pioš et al., 2014).

Previously, festivals were traditionally organized for the purpose of celebration, relaxation, rest and recovery (for example, planting or harvesting crops, which is a period of heavy physical work), as well as religious events and rituals (for instance, expressing gratitude to God for seasonal changes) (Bodwin et al., 2006; Salamone, 2004).

Meetings, exhibitions, fairs and festivals are organized within the scope of various touristic events. The importance of festivals is increasing among event tourism activities which are various in type and different in content (Getz, 2002). Zheldibayev et al. (2024) emphasize the critical role of infrastructure improvement, effective marketing campaigns, and the promotion of cultural events in fostering sustainable tourism. Their findings suggest that targeting diverse tourist activities, such as cultural festivals, can enhance both domestic and international tourist engagement, aligning closely with the goals of ethno-festivals in promoting cultural and economic sustainability.

2. Functions of festivals

Festivals play a vital role in safeguarding and disseminating cultural traditions, ensuring their transmission across generations. This function is particularly significant in a globalized world, where the risk of cultural homogenization threatens the preservation of local identities. By anchoring communities in their heritage, festivals reinforce cultural continuity and resilience (Richards & King, 2022). Beyond their cultural significance, festivals also generate substantial economic benefits by boosting tourism and supporting local businesses. For example, the integration of food tourism with festivals in Turkey illustrates how culinary events can simultaneously promote cultural tourism and stimulate economic growth (Demir & Dalgıç, 2022). These events create vibrant platforms for showcasing local resources while attracting both domestic and international visitors. Another essential function of festivals is fostering community engagement. They act as inclusive spaces where diverse audiences can come together, promoting a sense of belonging and collective pride. Events that celebrate local traditions, while embracing inclusivity, exemplify how festivals enhance social cohesion (Noh et al., 2024). Another essential function of festivals is fostering community engagement. They act as inclusive spaces where diverse audiences can come together, promoting a sense of belonging and collective pride. Events that celebrate local traditions, while embracing inclusivity, exemplify how festivals enhance social cohesion (Noh et al., 2024). By empowering communities to actively participate in festival organization and promotion, these events create a shared sense

of ownership while enhancing Festival Satisfaction (Kadyrbekova et al., 2024). This aligns closely with the idea that festivals are not only cultural celebrations but also powerful tools for community building and engagement.

Festivals are also instrumental in enhancing the attractiveness of destinations by extending tourist seasons and diversifying tourism offerings. For instance, cultural festivals in Hong Kong, such as the Lantern Festival, are strategic tools for destination branding, significantly contributing to increased visitor satisfaction and repeat visitation (Richards & King, 2022). Moreover, festivals often serve as platforms for creative expression and cultural innovation. Thematic programming and effective branding, as demonstrated by food festivals in the United States, enhance visitor experiences by providing unique and memorable engagement opportunities (Kesgin et al., 2022).

Additionally, festivals act as powerful educational platforms, offering insights into diverse cultures and traditions. The integration of music and arts into educational routes, such as the Festival Route in Cáceres, Spain, highlights how festivals can contribute to cultural literacy and value-based learning, enriching the participants' understanding of local history and arts (Gómez-Ullate & Saraiva, 2024). However, destination image and perceived risks, such as safety and infrastructure concerns, also play pivotal roles in shaping tourists' decisions. Loi et al. (2024) highlight that even when destination attitudes are positive, perceived risks such as inadequate safety or poor infrastructure can moderate tourist behavior. These insights are particularly relevant for understanding how perceived risks influence Festival Image (FI) and Intent to Revisit (IR) in the context of ethno-festivals. For instance, ensuring safe, well-organized events with robust infrastructure can significantly enhance the visitor experience and encourage repeat visitation.

In summary, festivals serve as cultural, economic, social, and educational cornerstones. By preserving traditions, stimulating economic growth, fostering community engagement, branding destinations, encouraging innovation, and providing educational opportunities, they hold a multifaceted significance in contemporary society.

3. Ethno-Fest

Ethno-festivals specifically emphasize the cultural heritage of immigrant communities that have settled in a particular area. These events have gained importance in urban life due to their ability to generate positive economic and social impacts (Quinn, 2005). Ethno-festivals are lively public gatherings that combine traditions, customs, rituals, folk celebrations, and interactive activities, creating a dynamic cultural space within a country. They typically feature concerts, markets, workshops, theatrical performances, and more, promoting intercultural exchange. A central focus of ethno-festivals is the passing down of cultural values, the preservation of traditions, and the safeguarding of historical and cultural heritage (Pletsan, 2022). Ethno-festivals have long been celebrated as pivotal platforms for preserving cultural heritage, fostering community cohesion, and contributing to the development of sustainable tourism. Existing literature has extensively documented the multifaceted benefits of such festivals, including their ability to serve as cultural preservation tools, enhance local and regional identities, and stimulate economic activity. Dimitrovski et al. (2024) emphasize the importance of festival attributes such as food quality and locality in driving visitor satisfaction and generating positive word-of-mouth (WOM), particularly among younger attendees. Similarly, Nguyen & Nguyen (2024) highlight the challenges posed by modernization in maintaining traditional festival practices, emphasizing the need for adaptive strategies to sustain cultural authenticity. These insights underline the critical interplay between festival features and visitor engagement, demonstrating how well-executed festivals can act as key drivers of cultural and economic sustainability.

The role of community involvement in legitimizing festivals has also garnered significant attention. Fiuza et al. (2024) propose that perceptions of legitimacy, rooted in cultural authenticity and meaningful local participation, are instrumental in securing long-term support for festivals. Ghosh et al. (2024) further expand on this by discussing the tensions between cultural preservation and environmental sustainability in the context of tribal festivals, advocating for innovative approaches to balance these competing priorities. Moreover, Irimiás et al. (2024) point out the underrepresentation of social sustainability in festival communication strategies, calling for more inclusive digital marketing practices that can bridge the gap between community engagement and broader festival promotion.

Ethno-gastronomic tourism has increasingly gained popularity, with ethno-gastronomic tours becoming a common addition to excursion, educational, ecological, and event tourism. While catering is a standard part of all tourist programs, it takes on a special significance in gastronomic-focused tours. Participants are not only served traditional cuisine, but are also given the chance to savor unique local products and dishes from the region. These experiences are paired with the region's traditional elements of hospitality and customs. This approach offers tourists unforgettable memories and a truly unique travel experience (Khetagurova & Kryukova, 2021). Gastronomy or food festivals are essential in showcasing and promoting local cultures. These festivals are public celebrations focused on specific food items, with their names often straightforward and descriptive, indicating the event, the featured dishes, the year, and the location (e.g., Taste of Springfield Festival 2019). Such naming conventions help to promote a location by emphasizing its unique culinary offerings (Fontefrancesco & Zocchi, 2020). Local cuisine is a key element of a destination’s intangible heritage, offering tourists a chance to experience authentic cultural interaction through food. Moreover, cuisine remains one of the rare elements of intangible heritage that has preserved its authenticity within immigrant communities, enabling individuals in target markets to recognize and value traditional foods (Okumus et al., 2007).

Therefore, ethno-festivals and the food they feature play a vital role in enhancing the tourist experience and supporting the regional economy. Situated at the crossroads of ancient trade routes in Central Asia, Kyrgyzstan’s geographical location, particularly the capital city Bishkek, provides a unique cultural and scenic backdrop for these festivals. This positioning not only highlights the country’s rich nomadic heritage and traditions but also enhances its appeal as a tourism destination, attracting visitors eager to explore its cultural and culinary diversity (Figure 1).



Figure 1. Images from Bishkek Ethno-Fest, 05.06.2023, Chunkurchak Valley, Bishkek, Kyrgyzstan (Haber 1. 2023)

MATERIALS AND METHODS

1. Sample and procedure

In the study, all data were collected from tourism business managers or representatives who participated in the ethno-fest held internationally in Bishkek, the capital of Kyrgyzstan, in 2023. 235 restaurants, 229 cafes, 96 hotels and 154 other food and beverage establishments were interviewed, the human resources department (HR) officials were informed about the research and the necessary approvals were obtained. All professional managers participated in the survey and filled out related applications on a voluntary basis. No fee or incentive was given to the participants during the data collection process, and the answers were obtained adhering to the principles of confidentiality and anonymity.

The participant selection process was determined by various criteria. First condition was the requirement of experience in attending at least one of the predetermined international ethno-fests as a visitor. Those who did not meet this requirement were not included in the research. Another criterion was to be working in a managerial position in businesses: as a manager, businessman, director, deputy director or heads of department. Personnel working outside the specified positions were not taken into account. An additional requirement was a minimum of 10 years of experience in the tourism industry. Employees with less than 10 years of experience were not taken into account. The last criterion was a full-time job in a related field. Employees with different statuses such as seasonal, contracted, part-time or per-hour were not included in the research.

2. Survey design

There are various dimensions of the research. It is aimed to evaluate the international ethno-fests' FI, PV and FL dimensions which are organized by tourism professionals who currently occupy a job position as managers in various enterprises of tourism sector. Moreover, the effect of these dimensions on FS and the effect of FS on IR and WOM were thoroughly examined. The dimensions in the research and the questions used to measure the dimensions are as follows:

- 5 questions used in Lin & Lee (2020) study to measure for FI dimension
- 3 questions used in Lin & Lee (2020) study to measure for PV dimension
- 3 questions used in Yoon et al. (2010) study to measure for FL dimension
- 3 questions used in Kim et al. (2015) study to measure for FS dimension
- 3 questions used in Kim et al. (2015) study to measure for IR dimension
- 3 questions used in Beckman et al. (2020) study to measure for WOM dimension

A five-point Likert scale, ranging from "(1) Strongly Disagree" to "(5) Strongly Agree," was provided to participants in order to determine the research's dimensions. The scale included professional data (experience in the tourism industry, festival experience, office or business they run, position) and personal details about the participants (age, gender, place of residence, and education). The model applied in the study is given in Figure 2.

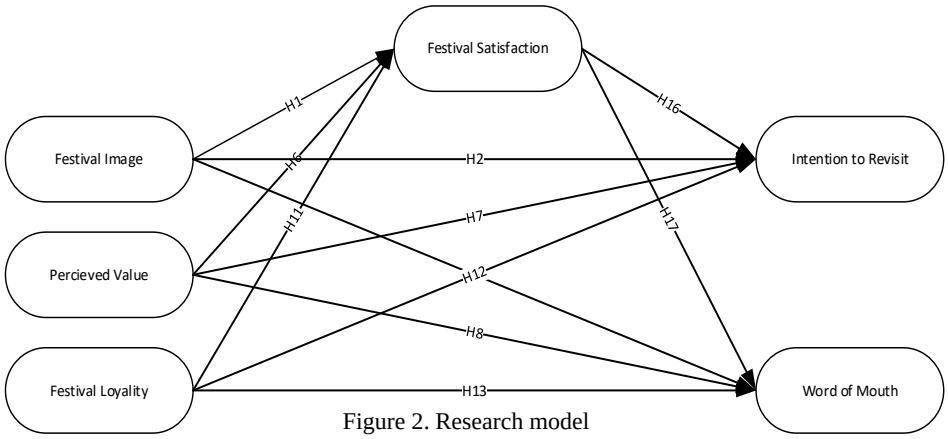


Figure 2. Research model

3. Measures

A survey utilized the convenience sampling method for data collection, which is commonly used in tourism research to secure a large number of participants (Juliana et al., 2022; Swamidoss et al., 2023). This approach is a non-random sampling method in which the researcher chooses the sample based on their own discretion. Convenience sampling involves gathering data from the population in the most accessible, quickest, and cost-effective manner (Etikan et al., 2016). In practice, it has been noted that this approach is used in 53% of cases (Kinnear & Taylor, 1996).

When calculating sample sizes, the sampling volume estimated a margin of error of 5% and a reliability of 95% and minimum 384 pieces were found (Büyüköztürk, 2011; Yazıcıoğlu & Erdoğan, 2004). As a result, the inclusion of 714 samples in the study is adequately sufficient. The data collection process was completed in a single step and in a six-month period (August-December 2023). Survey applications were carried out in tourism establishments and at the appointment time given by the participants themselves, and researchers conducted the survey face to face. The issue of common method bias (CMB) can arise in research when both dependent and independent variables are assessed using similar sources (Podsakoff et al., 2003). Some measures were taken to prevent this and keep CMB under control. At first, the tourism business officials who would be included in the sample were interviewed and the tourism professional personnel who met the specified criteria were determined. Another precaution was interviews held with personnel, preliminarily, before conducting the actual research. Since the purpose and importance of the research was explained to tourism professionals, those who expressed their desire to participate voluntarily in the survey were included in the study. Finally, according to the study made by Podsakoff et al. (2012), the vast territory of Kyrgyzstan influenced the process of data collection on dependent and independent variables for a period of six months, in particular, the transportation challenges and the intense work tempo of businesses.

DATA ANALYSIS

The collected data were evaluated in terms of fitting norms and standards. Data were analyzed based on SPSS and AMOS. The results show that values correspond to the commonly accepted threshold values (-3 + 3) of the Skewness and Kurtosis values (Hsieh & Karatepe, 2019). Numerous studies have explored the impact of satisfaction on both FL and IR, frequently using structural equation modeling to validate the relationship among these three factors (Hoon Kim et al., 2010; Mason & Nassivera, 2013). Before testing the hypotheses, a Confirmatory Factor Analysis (CFA) was conducted using Anderson & Gerbing's (1988) two-step method to evaluate the discriminant validity of the research model and its measurements.

RESULTS

1. Respondent profiles

58.5% of the participants are men and 41.5% are women. Age of the participants: 46.8% are between 41 and 60, and 35.6% are between 26 and 40. Most of the participants live in the place where the festival is held (88.5%), while others live outside the province where the festival is held (11.5%) (Figure 3).

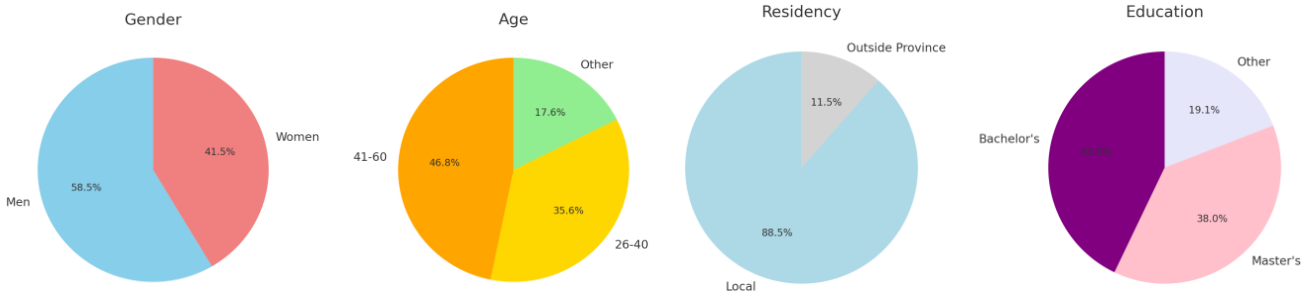


Figure 3. Participant demographics overview

Education of the participants: 42.9% have Bachelor's degrees and 38.0% have Master's degrees. 55.5% of the participants have 21-30 years of experience in tourism sector, and 29.1% have 31 years or more of experience. The rate of participation in festivals held earlier is 81.5%, and 70.9% among them have attended festivals 2-5 times. 46.9% of the participants work in the hotel business and 56.4% work as managers (Table 1).

Table 1. Professional experience

	n	%		n	%
Experience in the tourism industry (years)			**Number of participation in the festival**		
10-20	110	15.4	First time	132	18.5
21-30	396	55.5	2-5 times	506	70.9
31 and more	208	29.1	6 times and more	76	10.6
Type of business represented			**Position in the Business**		
Accomodation Business	335	46.9	Businessman	139	19.5
Food and Beverage Business	229	32.1	Manager/Director	403	56.4
Other	150	21.0	Deputy Director	172	24.1

2. Measurement model

In confirmatory factor analysis, certain prerequisites must be met. First, the standardized values of the scale items

should be higher than 0.50. Additionally, t-values higher than ±1.96 indicate that the items are significant (Hair et al., 2006; Schumacker & Lomax, 2004: 70). As a result of the confirmatory factor analysis, it was observed that the standardized loadings of festival image 6 (0.38) and festival image 8 (0.36) were below the required threshold, and these items were removed from the analysis. Although the loading value of festival image 7 was below 0.50, modification suggestions indicated that there would be no significant change in RMSEA and chi-square statistics, leading to the decision to retain this item in the analysis. Once the two items were eliminated, another confirmatory factor analysis was carried out. The analysis' results looked at the standardized loading values, error variances, and t-test results, which show the significance of the association between the latent variables in the model and the observed variables.

According to the findings, all t-values ($p \leq 0.001$) were found to be significant. The standardized loading values of the observed variables ranged from 0.86 to 0.97. The highest error variance among the variables was 0.84. Finally, the modification suggestions provided for the model were examined, and since no recommendations were found that would significantly improve the measurement model, the confirmatory factor analysis was concluded.

In confirmatory factor analysis, in addition to standardized values and t-values, the average variance extracted (AVE) and composite reliability (CR) are also calculated. The AVE is obtained by dividing the total of the squared standardized factor loadings for each item in a specific dimension by the number of items. An AVE value of 0.50 or above signifies an adequate level of agreement between the latent variables and the observed variables (Hair et al., 2006).

$$\mathbf{AVE} = \frac{\sum i=1n\lambda i2}{n}$$

Formula I. λ (lambda) represents standardized regression weight, standardized factor loading "n" is the number of sentences in that latent variable (Ping, 2004; Sudbury-Riley et al., 2017). Composite reliability (CR) is a key statistical measure used to evaluate the reliability of a construct, offering results similar to Cronbach's Alpha. The calculation involves squaring the sum of the standardized factor loadings for items within a particular dimension and dividing this by the squared sum of the standardized factor loadings plus the sum of their error variances. A composite reliability (CR) value between 0.60 and 0.70 is deemed acceptable, while a value of 0.70 or above signifies strong reliability (Hair et al., 2006).

$$\mathbf{CR} = \frac{(\sum \lambda i)2}{(\sum \lambda i)2+\sum \epsilon i}$$

Formula II. λ (lambda) is the standardized factor loading for item i and ε the respective error variance for item i. The error variance (ε) is estimated based on the value of the standardized loading (λ) (Ping, 2004; Sudbury-Riley et al., 2017).

The results of the confirmatory factor analysis revealed that the lowest AVE value for the latent variables in the measurement model was 0.73, and the lowest CR value was 0.89. Based on these values, it can be concluded that the items exhibit good construct validity with their respective constructs, and the reliability values for the dimensions exceed the critical thresholds. The findings from the confirmatory factor analysis regarding the measurement model are displayed in Table 2.

Table 2. Statistics related to the measurement model of confirmatory factor analysis

Dimensions and items	Standardized loading value	Margin of error	T Value	AVE	CR
FI				**0.73**	**0.94**
FI1	0.95	0.10	34.01		
FI2	0.89	0.21	30.33		
FI3	0.90	0.18	31.14		
FI4	0.94	0.12	33.24		
FI5	0.94	0.12	33.18		
FI6	0.40	0.84	10.96		
PV				**0.73**	**0.89**
PV1	0.93	0.13	30.95		
PV2	0.89	0.22	28.63		
PV3	0.74	0.46	22.28		
FL				**0.90**	**0.96**
FL1	0.94	0.11	33.82		
FL2	0.96	0.08	34.85		
FL3	0.96	0.09	34.56		
FS				**0.92**	**0.97**
FS1	0.97	0.06	35.66		
FS2	0.96	0.08	34.74		
FS3	0.95	0.10	33.98		
IR				**0.79**	**0.92**
IR1	0.86	0.26	28.16		
IR2	0.90	0.19	30.23		
IR3	0.92	0.16	31.21		
WOM				**0.90**	**0.96**
WOM1	0.96	0.09	34.35		
WOM2	0.95	0.10	33.83		
WOM3	0.94	0.11	33.42		

In the study, first level confirmatory factor standardization is given in Figure 4. After conducting confirmatory factor analysis, the goodness-of-fit indices for the measurement model were evaluated. Various indices, including normalized

chi-square, RMSEA, GFI, SRMR, CFI, NFI, NNFI, IFI, RFI, and CAIC, were analyzed to determine the model's adequacy. The results showed that all values fell within acceptable and optimal ranges. Thus, it can be concluded that the measurement model is a good fit. The fit statistics for the confirmatory factor analysis are provided in Table 3.

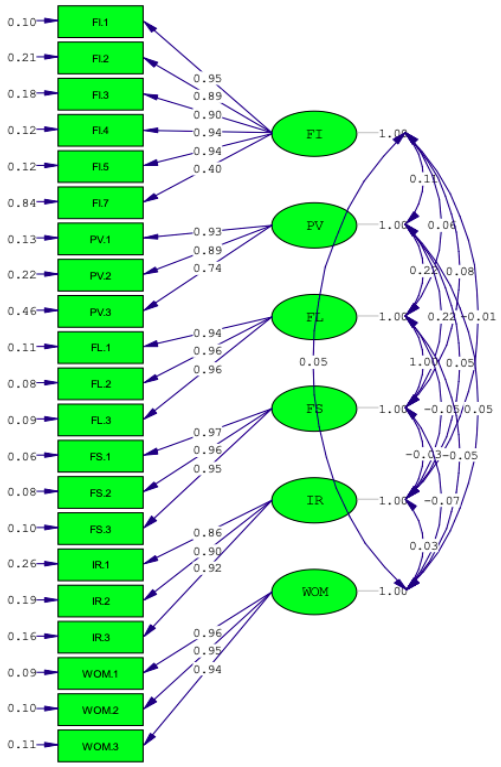


Figure 4. First level confirmatory factor standardization

Table 3. Goodness-of-fit statistics for the confirmatory factor analysis measurement model

Goodness-of-fit indices	Values related to the measurement model of the study	Reference values	
		Goodness-of-fit value	Acceptable goodness-of-fit value
X2/df	757.77/174=0.4	0≤ X2/ df≤ 2.5	3<X2/ df≤ 5
RMSEA	0.06	0≤RMSEA≤ 0.05	0.5<RMSEA≤0.08
GFI	0.91	0.90≤GFI≤1.00	
SRMR	0.06	SRMR≤0.08	
NFI	0.96	0.90≤NFI	
NNFI	0.96	0.90≤NNFI	
RFI	0.95	0.90≤RFI	
CFI	0.97	0.95≤CFI	0.90≤CFI
IFI	0.97	0.95≤IFI	0.90≤IFI
Model CAIC/Saturated CAIC	1189.31/1748.87	Model CAIC< Saturated CAIC	

DISCUSSION AND CONCLUSION

Organizers of the festivals attach a great importance to FS, IR and WOM, which, in turn, are very important factors in the sustainability of the events. There are many factors affecting FS, IR and WOM, therefore it has become an important topic of tourism research of the recent time. In this study, direct effects of FI, FL and PV variables on FS, IR and WOM, and indirect effects of FS on IR and WOM were investigated in ethno-fest organized on an international level. Inspired by the models applied in previous similar studies, the research model was developed and hypotheses were proposed and tested. The research model develops the theoretical and applied literature on festival events in the tourism sector.

Loyalty is an important issue in destination management, as tourists, permanently coming to one and the same destination, are more likely to both extend their planned stay at the destination and increase their planned spending (Yang & Peterson, 2004). In the field related literature, it has been emphasized that there is a strong relationship between positive tourism experiences that strengthen emotional ties to destinations (Gezhi & Xiang, 2022) and better service quality (Pai et al., 2021), and tourists' destination loyalty as well. Although, it is a desirable factor for tourism due to the strong orientation towards IR and WOM and the marketing and economic benefits that appear to be a part of success (Chi & Qu, 2008). Folgado-Fernández et al. (2017) concluded in their research work on festivals in Spain that the ethnic experiences of festival visitors have a positive effect on their image and loyalty.

1. Theoretical implications

There are many factors, in theory, that tourism professionals can evaluate in relation to the sustainability of festivals. However, basically, these factors should be identified depending on visitors' FS, IR and WOM behaviors. This study

concluded that FI, PV, and FL have a direct and positive impact on the provision of FS by tourism enterprises. Enhancing visitors' satisfaction with the ethno-festival and the systematic organization of these events will boost the destination's tourism appeal and contribute to its development in both economic and social dimensions. Notably, unlike similar studies, this research evaluates ethno-festivals from the perspective of operators—industry professionals—rather than visitors. In doing so, it addresses a gap in the existing literature.

2. Practical implications

In recent years, tourists' interest in "special interest tourism" has increased significantly. Among these tourism activities for a specific purpose, festivals are in demand not only by tourists but also by local people, local tradesmen and tourism businesses operating in the region. For this reason, it has been noted that academic studies on festivals and festival tourism have increased (Dalgiç & Birdir, 2020; Li et al., 2020). Individuals who have experienced positive emotional and cognitive responses in the past are likely to develop satisfaction and hold favorable views about the festival they attended. This, in turn, raises the likelihood that they will participate in the festival again in the future (Papadimitriou, 2013).

3. Limitations and future research directions

This study has yielded substantial results, shedding light on the dynamics of Festival Image (FI), Perceived Value (PV), Festival Loyalty (FL), Festival Satisfaction (FS), Intent to Revisit (IR), and Word-of-Mouth (WOM) within the context of international ethno-festivals in Kyrgyzstan. However, several limitations should be acknowledged, which also pave the way for future research directions.

3.1. Limitations of the study

The research focused exclusively on international ethno-festivals in Kyrgyzstan, excluding those that do not meet the international status or lack regular occurrence. Consequently, the findings may not fully reflect the dynamics of local or national festivals. Festivals with distinct organizational structures, visitor demographics, and content remain unexplored, limiting the generalizability of the results. Data were collected from ethno-festivals held across seven different regions in Kyrgyzstan. While this provided a broader understanding, the results were influenced by regional and seasonal differences, such as the timing of festivals (weekday vs. weekend), festival content (events, accommodation, transportation), and fee structure (free vs. paid). These variabilities may impact the comparability of data and limit the study's capacity to generalize findings across all festivals. Variations in visitor profiles, including differences in domestic versus foreign tourists, as well as demographic factors like age, income level, and nationality, were not fully accounted for.

These demographic differences might influence Festival Satisfaction (FS), Intent to Revisit (IR), and WOM behaviors, potentially affecting the uniformity of the results. While the study primarily emphasizes the positive aspects of festivals, such as their contribution to tourist satisfaction and loyalty, it does not comprehensively explore the negative dimensions. Issues such as organizational challenges, visitor dissatisfaction, or logistical inefficiencies remain underexplored, which could have offered a more balanced view. Although the study took measures to mitigate Common Method Bias (Podsakoff et al., 2003), inherent limitations in self-reported surveys, such as response biases or social desirability, may still influence the results. The study focused on a specific set of independent variables (FI, PV, and FL). However, additional factors such as the economic impact of festivals (Antonio Rivera et al., 2008) or the mediating roles of other variables (Aşan et al., 2020; Dalgiç & Birdir, 2020) could provide a more comprehensive analysis of the relationships among variables.

3.2. Future research directions

Future research should include festivals at the local and national levels to provide a broader perspective. Exploring these types of festivals will offer insights into the diverse cultural and economic dynamics that may differ from international events. Expanding the study to an international context by applying the current research model to festivals in other countries will allow for cross-cultural comparisons. This will enable researchers to assess how cultural differences influence FI, PV, FS, and WOM, providing a more global understanding of festival dynamics.

Investigating the negative aspects of festivals, such as visitor dissatisfaction, organizational inefficiencies, or environmental concerns, is essential. Such studies can compare positive and negative aspects, offering a balanced view that would contribute significantly to the literature. Including additional variables, such as the economic impact of festivals or the mediating roles of variables like visitor expectations, will enrich the research. For example, economic impact studies could assess how festivals contribute to regional development, while mediating variables could offer insights into indirect relationships among factors. Collecting aggregated data from a larger pool of festivals over an extended period would enhance the robustness of the findings. Longitudinal studies could reveal trends and changes in festival dynamics over time, addressing methodological challenges like relatively lower correlations between variables. Future research can delve deeper into visitor segmentation by demographic and psychographic characteristics. Understanding how different visitor segments perceive festival experiences and their subsequent behaviors can help festival organizers tailor experiences more effectively.

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FORECASTING THE NUMBER OF ASEAN TOURISTS TO INDONESIA WITH THE HYBRID SINGULAR SPECTRUM ANALYSIS-SUPPORT VECTOR MACHINE METHOD

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Abstract: Tourism plays a crucial role in Indonesia's economy, significantly contributing to the nation's revenue, employment, and overall growth. ASEAN countries represent one of the largest sources of international tourists, making their travel patterns essential for Indonesia's tourism sector. Accurately forecasting the number of tourists from ASEAN nations is crucial for formulating effective policies and strategies to enhance tourism development. This study aims to provide a reliable forecast of ASEAN tourist arrivals to Indonesia, utilizing the hybrid Singular Spectrum Analysis-Support Vector Machine (SSA-SVM) method. Monthly time-series data spanning from January 2017 to June 2024 is analyzed to predict future trends in tourist visits. The data, sourced from Badan Pusat Statistik (BPS), captures detailed records of ASEAN tourist arrivals. SSA is applied to decompose the data into key components such as trend, seasonality, and noise, which are then processed by the SVM model to forecast future arrivals. This hybrid approach effectively handles non-stationary data and captures intricate patterns that are often missed by traditional forecasting techniques. Unlike conventional methods, SSA-SVM offers a more robust solution to complex time-series forecasting, as it combines the power of SSA in data decomposition with the precision of SVM in pattern recognition. The model's accuracy is tested against ARIMA, Exponential Smoothing, and standalone SVM, with results showing superior performance. The SSA-SVM model yields the lowest error rates, achieving MAPE (0.220%), MAE (33,274.64), and RMSE (43,716.18), outperforming the other models. These results indicate the model's higher precision and reliability in predicting ASEAN tourist arrivals. By offering better generalization and reducing forecasting errors, SSA-SVM provides valuable insights for tourism stakeholders and policymakers, helping to allocate resources more efficiently, design targeted marketing strategies, for fluctuations in tourism demand. The findings also highlight the potential of SSA-SVM for improving the accuracy of long-term tourism forecasts, ultimately contributing to sustainable tourism development in Indonesia. This research opens avenues for further exploration into machine learning and hybrid forecasting methods in tourism, aiming for more adaptive, data-driven decision-making in the sector.

Keywords: singular spectrum analysis, support vector machine, hybrid model, tourism, ASEAN, Indonesia, forecasting, time-series analysis, non-stationary data, machine learning

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INTRODUCTION

Tourism is a key driver of Indonesia's economic growth, contributing significantly to revenue generation and employment (Aida et al., 2024). Indonesia is trying to make this sector stronger through various strategic policies (Redi & Jonny, 2023). The amount of foreign tourist arrivals is one of the most important parameters for evaluation of the success of this sector (Mazaraki & Antoniuk, 2021; Redi & Jonny, 2023). One of the critical factors for optimizing that parameter is the accurate forecasting of tourist arrivals. Understanding and predicting tourist flows is essential for developing informed policies and improving strategic decision-making in the tourism sector. Accurate forecasting allows the government and stakeholders to allocate resources effectively, target the right markets, and prepare for fluctuations in demand.

Indonesia's tourism sector enjoys significant advantages, including its diverse natural scenic, abundant cultural heritage, and world-renowned culinary traditions. These factors attract a significant amount of tourists from ASEAN countries, contributing to the country's economic growth (Apriyanti et al., 2023; Priadi, 2021). ASEAN countries are essential to Indonesia's tourism sector, accounting for a significant portion of total foreign tourist arrivals. In 2019, before the COVID-19 pandemic, ASEAN tourists made up approximately 40% of total foreign arrivals in Indonesia, with Malaysia

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and Singapore being the top contributors (Hidayat & Zeng, 2023). The tourism sector has reacted to the rapidly expanding market with bigger investments, but the question still lingers about the long-term expansion possibilities (Esquivias et al., 2021). However, in recent years, fluctuations in ASEAN tourism demand have been observed due to economic shifts, changing travel preferences, and external disruptions.

The tourism sector continues to face a number of challenges. Key among these challenges are the fluctuations in the number of tourist arrivals due to external factors such as global economic instability, changes in visa policies, and, more recently, the COVID-19 pandemic, which caused a severe decline in the number of foreign tourists to Indonesia (Yudha et al., 2022; Yin et al., 2020). The COVID-19 pandemic negatively impacted on the quantity of tourist visits and reduced overall performance of this industry. The COVID-19 may lead to a decrease of 16.65 million tourists and a potential loss of US$19.07 billion in Indonesia's tourism sector (Esquivias et al., 2021). Additionally, the tourism industry is plagued by an inability to accurately predict visitor behavior, primarily due to the reliance on outdated or simplistic forecasting methods that fail to capture complex patterns in data (Hu, 2022; Pinto da Costa & Cabral, 2022). Therefore, the lack of ability to catch complex patterns and data variations may hinder the growth of this wing (Pinto da Costa & Cabral, 2022).

Several recent studies have explored forecasting models for predicting foreign tourist arrivals in Indonesia, but most exhibit limitations in long-term forecasting. For instance (Sawitri et al., 2021) applied Holt-Winters Multiplicative models, which performed well for short-term predictions but struggled with long-term accuracy due to their lack of ability to catch complex data patterns (Sawitri et al., 2021). Similarly (Fahmiyah et al., 2024) utilized SARIMA and Holt-Winters approaches, which effectively model seasonal patterns but are less reliable for long-term forecasting. Meanwhile (Khusna et al., 2024) employed a Multi-Input Intervention ARIMA model to integrate external factors, yet its effectiveness is constrained by the need for predefined interventions, limiting adaptability to evolving tourism patterns.

The core problem is the lack of advanced analytical techniques for accurately forecasting tourist trends. To overcome this problem, we propose an accurate approach such as a combination of Singular Spectrum Analysis (SSA) and Support Vector Machine (SVM) methods which can capture complex patterns in the data. The visit pattern in the data could be valuable for recognize opportunities and challenges of the tourism industry (Zhang et al., 2020). The application of this method can provide more accurate forecasting results regarding future tourist visit trends. In-depth data analysis helps in identifying factors that influence changes in tourist behavior (López-Sanz et al., 2021; Santos et al., 2022). In addition, the results of this forecast have an impact on the development of marketing strategies in this sector that are more effective to circumstances (Bi et al., 2022; Mulhearn et al., 2020). With this, data-based planning will improve the competitiveness of Indonesia's tourism sector at the international level (Wu et al., 2023).

Potential solutions can be seen as the SSA (Singular Spectrum Analysis) and SVM (Support Vector Machine) methods as they can identify more complex patterns and lead to more accurate predictions. These two are mixed methods can expose hidden patterns and behaviors in data that are hard to recognize through traditional methods (Hu, 2022). To demonstrate the success of SSA-SVM methods in other sectors and justify their application in tourism, previous studies have shown that the optimized SSA-SVM method effectively predicts atmospheric PM2.5 concentrations with high accuracy and better practical value compared to other methods (Gong et al., 2024). Moreover, the employed SSA-SVM method encourages better data-driven decision making. These model approaches are expected to give a positive contribution to tourism in Indonesia. By leveraging the strengths of SSA in decomposing time series data and SVM in capturing nonlinear relationships, this study aims to establish a robust forecasting framework that exceeds the limitations of existing approaches.

This research aims to develop an advanced forecasting model for predicting the number of tourists from ASEAN countries visiting Indonesia using SSA-SVM. The main goal is to improve prediction accuracy and enhance strategic decision-making in the tourism sector. By providing a more reliable forecasting model, this study contributes to the formulation of data-driven policies that help mitigate the impact of external disruptions and optimize resource allocation in Indonesia's tourism industry. The data of foreign tourist visits will be be deeply analysed in this study. In conclusion, improving the accuracy of tourist forecasting is essential for Indonesia’s tourism industry to remain competitive and sustainable. By adopting advanced methods such as SSA-SVM, this research will offer valuable insights that can help policymakers and industry leaders create effective, data-driven strategies to boost Indonesia’s position as a leading tourist destination in Southeast Asia (Maheswari et al., 2023).

MATERIALS AND METHODS

Existing forecasting methods like ARIMA have limitations in capturing complex patterns in ASEAN tourist arrival data. To address these issues, this study employs SSA-SVM, where SSA extracts key components (trend, seasonality) and reduces noise, while SVM models the non-linear relationships for more accurate predictions. This hybrid approach enhances forecasting performance compared to conventional methods.

A. Data description

This dataset was obtained from Badan Pusat Statistik (BPS) and contained monthly time series data from January 2017 to June 2024, totaling 90 observations. It recorded the number of ASEAN tourist arrivals to Indonesia, allowing for the analysis of seasonal trends and external factors affecting tourism. Exploratory data analysis revealed a strong seasonal pattern, especially during holiday periods, along with fluctuations influenced by government policies and global events.

B. Preprocessing data

In this paper, time series forecasting was achieved by applying several organized steps for the combined method of

Singular Spectrum Analysis (SSA) and Support Vector Machine (SVM). We started with raw time series data collection and processing. The data required cleaning up; missing values were handled by interpolation or other imputation methods before being applied to the model (Goel & Tushir, 2021). In addition, standardization was also performed on foreign tourist visits data from ASEAN to Indonesia to ensure stability, prevent optimization problems in SVM, improve pattern extraction in SSA, and speed up convergence, prevented the dominance of large-scale variables, and reduced overfitting. We standardized the data through Min-Max Scaling or Z-score Normalization.

$$\text{Min} - \text{Max Scaling: } x'_i = \frac{x_i - \min(X)}{\max(X) - \min(X)} \quad \text{(Source: Tukey, 1977)}$$

Where:

- x_i : original data point (number of tourist arrivals, unit: persons)
- x'_i : scaled data point (unitless, rescaled between 0 and 1)
- $\min(X)$: minimum value in dataset (persons)
- $\max(X)$: maximum value in dataset (persons)

Min-Max Scaling rescaled the data between 0 and 1, maintaining the original distribution while adjusting the range.

$$\text{Z} - \text{score Normalization}: \; x'_i = \frac{x_i - \mu}{\sigma} \quad \text{(Source: Altman, 1968)}$$

Where:

- x_i : original data point (number of tourist arrivals, persons)
- x'_i : normalized data point (unitless, in standard deviation units)
- μ : minimum value in dataset (persons)
- σ : maximum value in dataset (persons)

Z-score normalization adjusted the data to have a mean of 0 and a standard deviation of 1, enhancing its suitability for machine learning models that required normally distributed inputs.

C. Singular Spectrum Analysis (SSA)

The Singular Spectrum Analysis (SSA) method was applied to analyse trends, seasonality, and random components in ASEAN tourist arrival data. SSA was highly useful in identifying underlying patterns in time series data, especially in the context of forecasting the number of tourists. The following were the key steps in the implementation of SSA:

1) Embedding (Hankel Matrix Representation)

SSA began with the construction of a trajectory matrix from the time series $X = \{x_1, x_2, x_3, \dots, x_N\}$ into a high-dimensional space. The first step involved building the trajectory matrix from the time series data of ASEAN tourist arrivals. Given a window length L the Hankel matrix X was defined as:

$$X = \begin{pmatrix} x_1 & x_2 & \cdots & x_K \\ x_2 & x_3 & \cdots & x_{K+1} \\ \vdots & \vdots & \ddots & \vdots \\ x_L & x_{L+1} & \cdots & x_N \end{pmatrix} \quad \text{(Source: Golyandina \& Zhigljavsky, 2001)}$$

Where:

- X : trajectory matrix (unit: number of tourist arrivals, persons)
- x_i : original time series data (persons)
- N : total count of observations in the time series. (unitless count)
- L : window length (unit: number of time steps)

With $K = N - L + 1$. This transformation allowed the extraction of underlying patterns such as seasonality and long-term trends in tourist arrivals.

2) Singular Value Decomposition (SVD)

After forming the trajectory matrix X, the matrix was decomposed by Singular Value Decomposition (SVD) (Li et al., 2021). The matrix in SSA which results in singular established by the formula $S = XX^T$. For example, $\lambda_1, \dots, \lambda_d$ were the eigenvalues of the matrix S with $\lambda_d \geq \cdots \geq \lambda_1 \geq 0$ and $U_1, \dots, U_d$ were the eigenvectors of each eigenvalue. The vector $V_i = X^T U_i / \sqrt{\lambda_i}$ for $i = 1, \dots, d$ where $d = \max\{i | \lambda_i > 0\}$. Then the path matrix Singular Value Decomposition (SVD) was defined as:

$$X = X_1 + \cdots + X_d \text{ with } X_i = \sum_{i=1}^{d} \sqrt{\lambda_i} U_i V_i^T \quad \text{(Source: Eckart \& Young, 1936)}$$

where λ_i was the singular value (eigenvalue), and U_i and V_i were the corresponding eigenvector pairs. Through SVD, redundant data were removed, and the time series was broken down into meaningful components that reflected different patterns in tourist arrivals.

3) Grouping

In the reconstruction step, matrix X was also grouped into subsets based on the formation patterns of the time series data, including trends, seasonality, and noise. The results of the grouping were then summed, meaning the matrix divided the set index $\{1, \dots, d\}$ into m independent subset, $I_1, \dots, I_m$.

Suppose $I = i_1, i_2, \dots, i_p$ then the result matrix X_I corresponded to the group defined as $X_I = X_{i1} + \cdots + X_{ip}$. The SVD expansion was calculated with $I = I_1, \dots, I_m$, so that the decomposition became $X = X_{I1} + \cdots + X_{Im}$.

The procedure for selecting $I_1, I_2, \dots, I_p$ was called eigentriple grouping. Applying this grouping method helped identify seasonal trends in ASEAN tourist arrivals by isolating dominant singular components associated with periodic fluctuations.

4) Diagonal Averaging

The aim of the diagonal averaging stage was to obtain the singular value of the components that had been separated, which would then be used in forecasting. At this stage, the matrix X_{ij} obtained in the grouping stage was rearranged into a new set of data with a length of N. Suppose Y was a matrix of size $L \times K$ with elements y_{ij}, with $1 \leq i \leq L$ and $1 \leq j \leq K$. We define $L^* = \min(L, K)$ and $K^* = \max(L, K)$, and $N = L + K - 1$.

Using the diagonal averaging method, the matrix Y was converted back into series, $y_1, \dots, y_n$ here is the following equation:

$$y_k = \begin{cases} \frac{1}{k}\sum_{m=1}^{k} y_{m,k-m+1} & for\ 1 \leq k \leq L^* \\ \frac{1}{L^*}\sum_{l=1}^{L^*} y_{l,k-m+1} & for\ \ L^* \leq k \leq K^* \\ \frac{1}{N-k+1}\sum_{l=N-K+1}^{N} y_{l,k-m+1} & for\ K^* < k \leq N \end{cases}$$ (Source: Broomhead & King, 1986)

Where:

- y_k : reconstructed time series value at index k (unit: number of tourist arrivals, persons)
- $y_{m,k-m+1}$: elements of the trajectory matrix (persons)
- N : total length of the reconstructed series (unitless count)
- L : window length (unit: number of time steps)
- K : number of columns in the trajectory matrix (unitless count)

This reconstruction process reassembled the significant components of ASEAN tourist arrivals while filtering out noise, making it useful for further predictive modelling.

D. Feature extraction from SSA for SVM prediction

After applying Singular Spectrum Analysis (SSA), the time series data was decomposed into three main components: trend, seasonal patterns, and noise. Trend extraction was conducted through SSA reconstruction to reveal the long-term movement in the data, providing insights into the growth or decline of ASEAN tourist arrivals. Additionally, the identification of seasonal components captured periodic patterns that reflected recurring variations, such as peak tourist seasons. By filtering out high-frequency noise, SSA also improved the quality of the dataset for predictive modeling. Once the decomposition process was completed, only the relevant components (excluding noise) were selected as input features for the Support Vector Machine (SVM). The reconstructed dataset allowed SVM to identify complex relationships within the data, enhancing the accuracy of future predictions for ASEAN tourist arrivals.

E. Support Vector Machine (SVM)

After transforming and reconstructing the ASEAN tourist arrivals time series through Singular Spectrum Analysis (SSA), the next stage involved employing a Support Vector Machine (SVM) for forecasting future arrivals or classifying seasonal travel patterns. SVM was a supervised learning algorithm primarily aimed at classification problems (Goel & Tushir, 2021). In this context, SVM was used to classify periods of high and low ASEAN tourist arrivals, helping stakeholders optimize tourism policies and resource allocation. Support Vector Machine (SVM) aimed to discover the optimal hyperplane that separated different tourist arrival patterns (e.g., peak and off-peak seasons) while maximizing the margin (Perros, 2021). The gap between the hyperplane and the closest data points from each class, referred to as support vectors ("Vector," 2020). Mathematically, the decision function of SVM is represented as:

$$f(x) = w^T x + b$$ (Source: Vapnik, 1992)

Where:

- $f(x)$: decision function (unitless, classification score)
- w : weight vector (adjustable parameters of the model, unitless)
- x : feature vector representing tourist arrival data (e.g., past visitor counts, seasonality indicators) (unit: persons)
- b : bias term (unitless, shifts the decision boundary)

1) Soft Margin SVM

In real-world cases, ASEAN tourist arrival data exhibited variations due to external factors like economic fluctuations, visa policies, and global events, making it impossible to achieve perfect linear separation. To tackle this, SVM introduced slack variables ξ_i that allowed some flexibility in the classification process, leading to the formation of a soft-margin SVM. The soft-margin SVM optimization problem was adjusted as follows:

$$\min_{w,b,\xi} \frac{1}{2}\|w\|^2 + C\sum_{i=1}^{l}\xi_i \text{ Subject to: } y_i(w^T x_i + b) \geq 1 - \xi_i \quad \forall i$$
$$\xi_i > 0 \quad \forall i$$

Where:

- ξ_i was denoted slack variables that permit some data to fall within the margin or be misclassified,
- C was a regularization parameter that balanced margin maximization and classification error minimization. This helped accommodate fluctuations in ASEAN tourist arrivals while maintaining a robust prediction model.

2) Kernel Trick

To improve classification accuracy for non-linearly separable tourist arrival data, SVM employed the kernel trick, enabling the SVM to project the sample input data into a higher-dimensional space in which a linear hyperplane could divide the classes.

$K(x_i, x_j)$ is a kernel function which calculates the inner product (dot product) in the higher-dimensional space without actually transforming the data. Some of the commonly used kernel functions were:

- Linear Kernel: $K(x_i, x_j) = x_i^T, x_j$
- Polynomial Kernel: $K(x_i, x_j) = (\gamma x_i^T x_j + r)^d$
- Radial Basis Function (RBF) Kernel: $K(x_i, x_j) = \exp(-\gamma \|x_i - x_j\|^2)$

In the context of linear data separation, the kernel function used by SVM helped classify data that could not be linearly separated efficiently. Many of those kernel functions lead to the RBF kernel, which transformed the data non-linearly and thus was selected the most due to its broader application in capturing complex relationships.

For ASEAN tourist arrivals, the RBF kernel was often preferred as it effectively captured complex seasonal and holiday-related fluctuations in the dataset, making it suitable for forecasting tourism demand.

3) Model Training and Prediction

Once the kernel function had been chosen, the SVM model was trained on the time series data after it was transformed by SSA. This involved training on historical ASEAN tourist arrivals, using labelled data points to determine the support vectors and calculate the maximum hyperplane for classification (Luo et al., 2022). In this phase, SVM attempted to minimize the classification error, maximizing the decision boundary between high and low tourist influx periods.

Once you trained your model, you could use it to classify or predict future tourist arrival trends. To determine the class label of a new data point \(x \), the following decision rule is applied:

$$y = sign(w^T x + b) \quad \text{(Source: Rosenblatt, 1958)}$$

The sign function which determined whether an upcoming period would experience high or low ASEAN tourist arrivals based on the model's learned patterns. This provided valuable insights for tourism authorities and businesses, allowing them to prepare accordingly by adjusting marketing strategies, hotel pricing, and resource allocation.

F. Model evaluation

Mean Absolute Percentage Error (MAPE) was a a metric for relative error employed to calculate the percentage deviation of forecast results and also showed how much the error in forecasting is compared to the actual value (Jimenez et al., 2021). The Measurement of the level of forecasting error in this study using MAPE with the following formula:

$$MAPE = \frac{1}{n}\sum_{j=1}^{n}\left|\frac{y_j - \hat{y}_j}{y_j}\right| \times 100\% \quad \text{(Source: Lewis, 1982)}$$

Where:

- y_j : actual value of tourist arrivals at time j (unit: persons)
- $\hat{y}_j$: forecasted value of tourist arrivals at time j (unit: persons)
- n : number of data points in the evaluation set (unit: time periods)

By integrating SVM after SSA-based forecasting, the model was further improved to capture intricate variations in ASEAN tourist arrivals. SVM's capability to learn patterns from historical data and external drivers, such as currency exchange rates or international travel restrictions, helped in reducing forecasting errors. Consequently, combining SSA with SVM provided a robust hybrid model for predicting future trends in tourist arrivals across ASEAN countries.

RESULTS AND DISCUSSION

A. Result

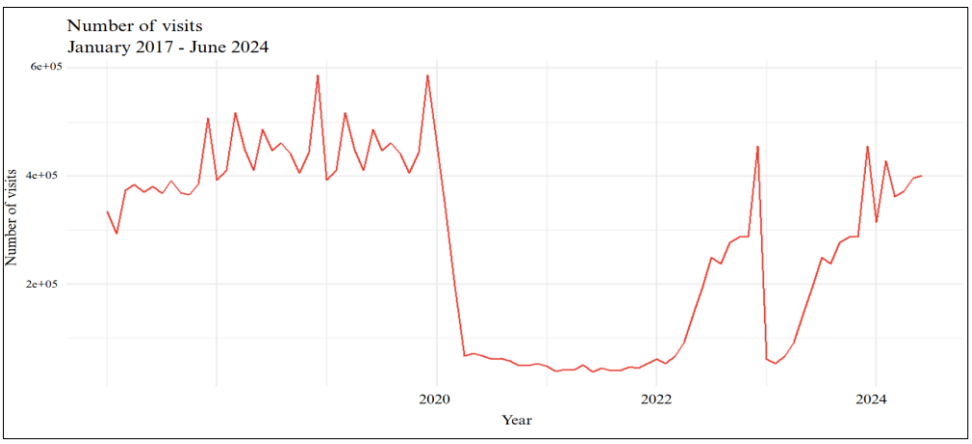


Figure 1. Number of foreign tourist visits January 2017 - June 2024 (Source: Data from Statistics Indonesia)

We analyzed the data using several functions available in the Rssa packages in R. The performance of the recommended approach was examined through simulated experiments. Then, we applied the method on practical data, specifically to tourist arrival data from ASEAN to Indonesia. Figure 1 shows the number of foreign tourist arrivals in Indonesia from January 2017 to June 2024. Between 2017 and 2019, visits remained stable at around 400,000–600,000 per month. In early 2020, this number plummeted to nearly zero due to the COVID-19 pandemic and travel restrictions. A gradual recovery began from late 2021 to early 2022 as restrictions eased and vaccinations increased. From 2023 to mid-2024, tourist numbers approached pre-pandemic levels but continued to fluctuate due to global uncertainties.

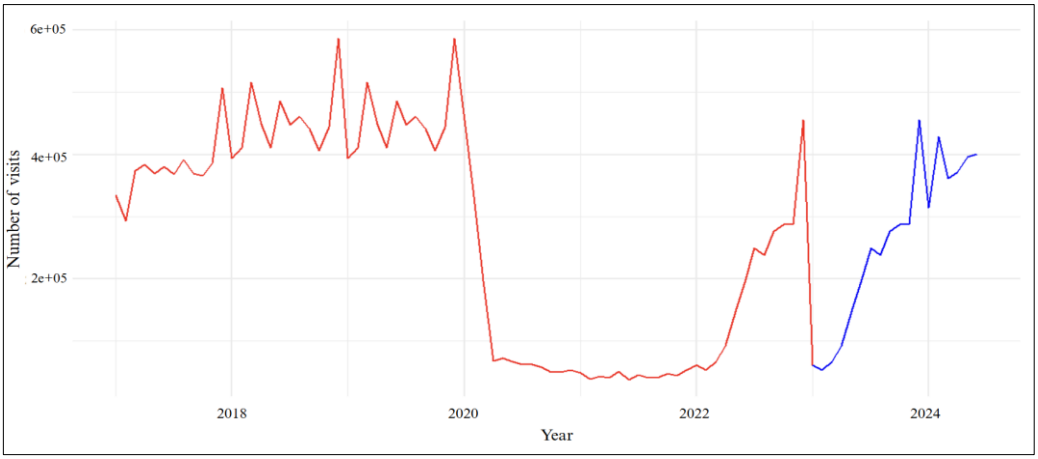


Figure 2. Training data and testing data split (Source: Data from Statistics Indonesia, processed by the author)

Based on Figure 2, the training data (2017–2022) reflects various scenarios, including the impact of the pandemic, helping the model recognize patterns under different conditions. Meanwhile, the testing data (2023–2024) shows a more stable recovery trend and is used to assess the model's prediction accuracy. This division is crucial for validation, with the training data capturing significant changes, while the testing data reflects more moderate variations.

Table 1. Comparison of forecasting model accuracy

Model	MAPE (%)	MAE	RMSE
ARIMA	0.286	47,484.70	61,544.66
Exponential-Smoothing	0.238	39,766.53	46,552.12
SVM	1.294	142,132.43	172,505.32
SSA-SVM	**0.220**	33,274.64	43,716.18

The performance comparison of forecasting models, as presented in Table 1, highlights the superior accuracy of the SSA-SVM method. SSA-SVM achieves the lowest MAPE (0.220%), MAE (33,274.64), and RMSE (43,716.18), outperforming ARIMA, Exponential Smoothing, and SVM. This result demonstrates the effectiveness of SSA-SVM in minimizing both absolute and squared errors, ensuring greater predictive precision. Notably, SVM exhibits the highest error values, indicating its inadequacy for this dataset. The consistently lower error rates of SSA-SVM suggest its robustness and suitability for forecasting applications requiring high accuracy, making it the most reliable model in this comparative analysis.

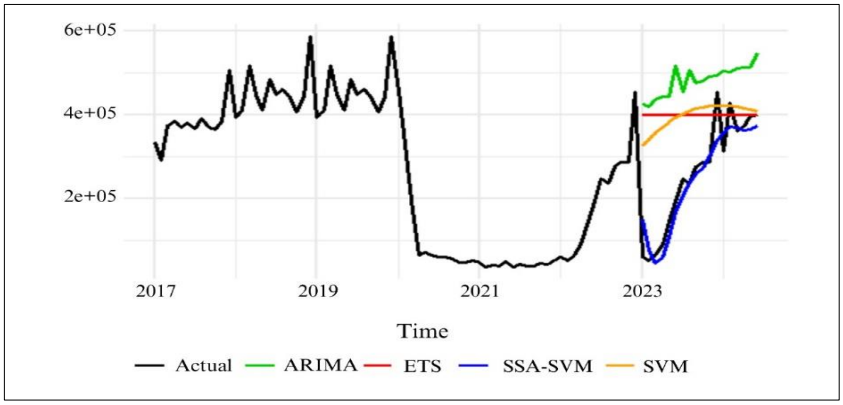


Figure 3. Comparison of forecasting model (Source: Data from Statistics Indonesia, processed by the author)

The comparison of forecasting models demonstrates that the SSA-SVM method outperforms traditional approaches in capturing the complex patterns of tourist arrivals. As observed in the visualization, SSA-SVM (blue line) closely follows the actual data trend, particularly during the post-2021 recovery period, whereas ARIMA (green) exhibits excessive fluctuations and ETS (red) fails to capture the underlying trend accurately.

While SVM (orange) provides a smoother forecast, it lacks the adaptability required to reflect rapid changes in the data. The superior performance of SSA-SVM highlights its ability to effectively model non-linear patterns and structural shifts, making it the most reliable and accurate forecasting approach in this context.

Figure 4 shows that the SSA-SVM model produces predictions that closely match the actual values, maintaining alignment throughout the forecasting period. This consistency confirms that SSA-SVM accurately captures trends and data variations. Its ability to track changes makes it a reliable model for time-series forecasting. The real-world applications of the forecasting model extend beyond tourism management. By leveraging accurate forecasts, government bodies and businesses can optimize marketing campaigns, resource allocation, and infrastructure development. For instance, tourism agencies can adjust promotional strategies based on predicted peak seasons, while hospitality sectors can manage hotel occupancy rates more effectively. Additionally, the model's application in other sectors, such as financial markets or public health, showcases its adaptability to different forecasting scenarios.

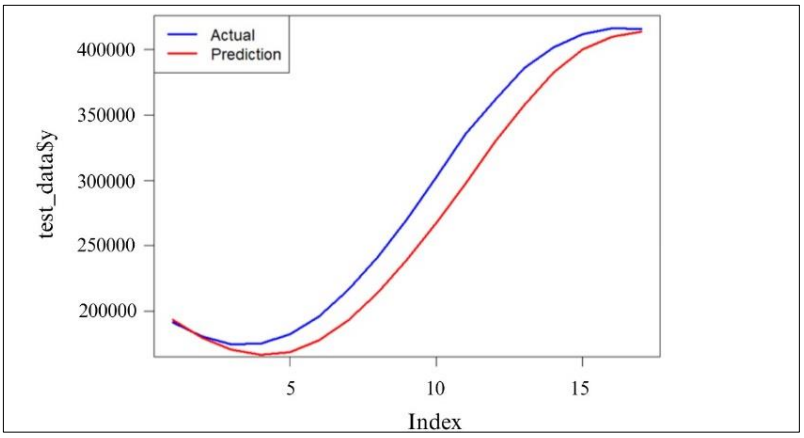


Figure 4. Comparison of actual value vs the prediction (Source: Data from Statistics Indonesia, processed by the author)

B. Discussion

Studies on tourism forecasting remain highly limited, especially in accounting for external shocks such as economic volatility, natural disasters, and health crises like COVID-19. These disruptions significantly impact tourism demand, making accurate forecasting crucial for risk management. The tourism sector, including in Indonesia, remains vulnerable to these shocks, emphasizing the need for more adaptive forecasting models.

The SSA-SVM method has proven effective in predicting tourist arrivals by decomposing time-series data into patterns, trends, and noise using SSA while leveraging SVM, on the other hand, is adept at classifying and predicting data by identifying non-linear relationships. This hybrid approach enables the model to handle high uncertainty better than traditional linear forecasting models. As illustrated in Figure 4, the model's predicted values closely align with actual data, confirming its accuracy in capturing tourist arrival dynamics.

To further improve prediction accuracy, future research should focus on refining SSA-SVM's sensitivity to sudden shifts in data trends. This could be achieved by adjusting the weights of the components within the model to better account for short-term fluctuations. Additionally, incorporating external data sources, such as geopolitical events and global health trends, could enhance its responsiveness to unexpected disruptions.

Beyond tourism, its success in predicting the non-linear and noisy nature of time-series data makes it a strong candidate for forecasting in other sectors affected by uncertainty, such as finance, supply chain management, and environmental studies. The method has been successfully applied in stock market trend prediction, identifying patterns that traditional models failed to capture. Its high adaptability allows for deployment in diverse environments where classical models often fall short, particularly in sectors affected by rapid fluctuations and multiple external influences.

These findings offer valuable insights for tourism stakeholders, including government officials, travel agencies, and hospitality businesses. Accurate forecasting can help policymakers develop effective tourism policies, plan infrastructure investments, and create targeted promotional campaigns. More accurate forecasting can help develop effective policies, optimize infrastructure investments, and create targeted marketing strategies. Moving forward, practical steps for implementation include integrating the SSA-SVM method into existing tourism forecasting platforms, training relevant stakeholders in its use, and continuously refining the model to improve its sensitivity to real-world fluctuations. By adopting this approach, tourism stakeholders can enhance decision-making and ensure industry sustainability in an increasingly unpredictable global landscape.

CONCLUSION

The goal of this study is to predict foreign arrivals visits in the coming years with the Singular Spectrum Analysis-Support Vector Machine (SSA-SVM) method. As the analysis result indicates SSA-SVM is a significant forecasting model with less error than ARIMA, Exponential Smoothing among others. With a MAPE of 4.66%, the SSA-SVM model effectively captures seasonal patterns and non-linear trends, making it a reliable tool for tourism sector forecasting. This highlights how SSA-SVM can process complicated data and produce reliable prediction outcomes.

For the monthly took, from the end of July 2024 to the end of December 2024 the number of foreign tourist's arrivals reflects a continuous uptick, with the quantity moving from 171,799.7 at the end of July 2024 to 330,942.8 at the end of December 2024. This trend reflects the potential revival in the tourism industry, which is likely affected by economic measures and intensive tourism promotion efforts. The consistency of this trend further validates the SSA-SVM model's ability to predict tourism demand accurately, offering crucial insights for decision-making in the tourism sector.

This paper utilizes the advantages of the SSA-SVM method for deeper and more complex forecasting, as it outperforms other models in handling seasonal variations and nonlinear data. The findings of this study provide a useful addition to tourism forecasting literature, as well as the potential for further investigation on how the sector may respond to future global dynamics. Moreover, future research could investigate how the tourism sector may respond to future global challenges, using SSA-SVM as a model to address potential shifts in demand. However, this study has some limitations, including the reliance on historical data, which may not fully atch sudden disruptions such as geopolitical events or pandemics. Future research could enhance SSA-SVM by integrating additional machine learning models, such as deep learning architectures to further improve forecasting accuracy. Moreover, refining feature selection techniques and incorporating real-time data, such as online booking trends and social media analytics, could enhance the adaptability of SSA-SVM in dynamic tourism markets. Expanding the model's applicability by testing its performance across different geographic regions and tourism categories would also provide broader insights into its robustness.

Additionally, exploring the model's effectiveness in long-term forecasting and assessing its sensitivity to economic and policy-related variables would offer valuable contributions to tourism demand modeling. Finally, applying SSA-SVM in crisis forecasting, such as predicting the impact of pandemics or geopolitical conflicts on tourism, could further extend its practical significance in decision-making and risk management. SSA-SVM not only provides precise predictions but also serves as a vital tool for stakeholders in developing more effective long-term strategic plans for the tourism industry.

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WHAT A TOURIST CAN SEE, OR AN ENVIRONMENTAL-AESTHETIC EVALUATION OF A GREEN AREA IN SZEGED, HUNGARY

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Abstract: Nowadays it is an evident feature in our fast-developing big cities, that there need to be steps taken to improve the inhabitants' well-being and their state of physical and mental health. Improved health can also be achieved by extending the proportion of well-cared-for green areas in city centres, or, by rehabilitating particular buildings, streets, or entire urban areas. These developments have an obviously beneficial psychological effect on people. The establishment of such 'liveable cities' is profitable not just for the local residents, but from the point of view of tourism as well. Tourists are likely to spend more of their free time in an urban area, which is free from the visible signs of social and political conflicts, free from the recognizable symptoms of environmental deterioration or technical decline. Most tourists prefer a "safe" urban environment that is not only "safe" in the sense of law enforcement, but devoid of visual conflicts. This is the reason why our research team have attempted to evaluate the environmental state of our city by determining a so-called Visual Liveability Index (VLI). In this process all those elements were evaluated by points which may have an impact on the aesthetic value of the settlement. We took into account both the elements that has positive impact to the appearance of the settlement, and those phenomenas that degrade the cityscape. Our aim was to keep the scoring system simple while also including numerical values for each observed visual conflict according to their significance. Then, after summarizing the given points, the next step was when the streets, squares and certain districts, finally the entire city us to be qualified with the help of the VLI index. Thus makes the results comparable with the same data of other similar settlements, or provides opportunity to determine the direction of development of the cityscape by examining the same settlement in two different date. This method is a relatively easy-to-use tool for local actors of settlement development and tourism to identify the conflict-causing elements of the cityscape which have an undesirable impact on the use of space by residents and tourists. It simply and visually points out those visual elements whose remediation can improve the competitiveness of the settlement. By applying it to larger urban areas it can be able to outline those urban areas where intervention is needed due to unfavorable processes.

Keywords: tourism, urban development, urban landscape, aesthetics evaluation, visual conflict

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INTRODUCTION

All human activities, including the spheres of work and leisure time, take place in one or another type of environment. This is why the state of that particulat environment is of special significance for us. Human activities have a definite impact on the environment, but, the same environment also influences the wellbeing and health of humans. Our mental and physical state may then significantly determine our activities and creativity. The city view plays an outstandingly important role in tourism; from the perspective of consumers the most important step in the process is when tourists choose a particular destination. Generally it is the architectural monuments, the built environment itself, which represent the most attractive landscape-shaping factors for tourists (Szalai & Szilágyi, 2007; Barcza et al., 2017). On the other hand, cityscapes, burdened with visual conflicts, are a major repellent for tourists (Karancsi et al., 2013). From another aspect, it is also important to add, that the interest shown on the part of tourists may underline the need for renovating valuable, but formerly neglected buildings, and also for the necessity of preserving some old structures (UNESCO, 1976).

When investigating city views the size and state of green areas is of outstanding significance. Parks and green areas played an important role in ancient cities as well (Virtudes, 2016). Examples include the Hanging Gardens of Semiramis in ancient Babylon, or, the Gardens of Maecenas in ancient Rome. In the Middle Ages urban green areas were still associated with the life of society's nobility and elite. In the first half of the 20th century, the age of fast industrial development, the significance of green areas and their integration in urban lifestyle was recognized again. By the early 20th century it had become common that the boulevards and avenues of big cities were lined with trees, and also, that certain city structures

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had to have parks, gardens, or shelter forest belts to separate them from one another. Urban designers of that age also attempted to synchronize some green areas with the built environment. As a result, suburbs came into being. Early examples included the garden cities of Letchworth and Hampstead near London. As a result of the strengthening of mass tourism the green areas in the centre of big cities have been more and more frequently visited by tourists, thus parks have become an integral part of the image of any wellknown urban tourist destination, such as the Luxembourg Gardens in Paris, the Hyde Park in London, or, the Central Park in New York City. Tourism, or, more correctly, tourism industry is usually interpreted by some authors (Pusztai, 2016; Boorstin, 1962) as a medium, capable of introducing a local product to tourists-consumers, playing the role of a mediator. In this respect tourism industry shows similarities with the media: first, it would pre-select the product to be sold, then, the product – already introduced to those who are interested – would be interpreted for potential buyers. Finally, especially in the age of mass tourism, the product itself would be transformed and improved. In the opinion of some researchers the product would eventually and practically become falsified. In case no product improvement can be detected, or, the product itself is not authentic, tourists would eventually be disappointed and express their disillusionment accordingly. The negativity of these personal accounts are very hard to compensate for.

From the point of view of the development of tourism it is of utmost importance to monitor the environmental changes of tourist destinations, and, if necessary, to stop, or slow down those processes, which may lead to the occurrence of visual conflicts, or may have a negative effect on people (Budai, 2004). Contentednesss with the environment is one of the most decisive factors of the quality of life. Research into the area of urban rehabilitation has proven that, since the changing of the political system in Hungary, the needs and expectations of people regarding their living conditions and living environment have basically increased (Bajmóczy et al., 2012). Despite this feature, as the distance grows between people's private sphere (homes, flats or private houses) and their wider living environment, the inhabitants are increasingly dissatisfied, because they have only limited opportunities to express their opinions concerning the way how the living environment is built or rebuilt (Egedy, 2007; 2009). The local governments, as well as investors, all hoping for an increase in tourism, spend a considerable amount of money on renewing public areas locally and making them more attractive (Boros, 2017). Several cities, having been hit hard by a declining industry, have already successfully reconstructed several of their public areas (Nagy, 2015). The main driving force of these activities was the desire to meet the needs and demands of travel industry, a phenomenon also called 'the economy of desire' (Pusztai, 2016). The impact of tourism on the hosts is that usually it is the tourists' interests that can make the locals become aware of the uniqueness and value of their own built environment. As a result, in the eyes of the residents, their own place may become more precious and prestigious (Garland, 1984). Additional reason for the development of traditional city spaces for tourism purposes could be that contemporary urban architecture failed to attract the attention of potential residents and tourists. Instead of fulfilling the expectations of local communities who want to strengthen their identity and tourists looking for experiences, the "mass-produced" contemporary city only repeats the templates of globalized architecture (Betancourt, 2023).

In Hungary, the main driving force of the reconstruction of city centres is investment in cultural tourism. In the period of the changing of the political system major renovation works were initiated and carried out by local governments. A good example of this initiative is the reconstruction of the Kárász Street (the main street) in Szeged. After Hungary joined the European Union this trend changed and became more complex: in the various phases of this work there were multiple players who cooperated, with the aim of diversifying the economy and improving the quality of life of city dwellers. The recurring elements of these works included the improvement of the physical state the place was in, as well as the intention of offering easy access to the improved environment (Lőrincz, 2007).

Cultural tourism and the rebuilding of public areas are in synergy with one another, thus the development in one area is to contribute to the improvent of the other one. The actually consumed 'product', an event, or a program can only be effective if there is a proper background to it. The setting itself is necessarily part of the attraction.

Later both the cities and the governments preferred those changes which had the portential of attracting large number of tourists to the place. Hungary intended to renew our green areas with the aim of attracting large number of tourists. Examples include the Gardens in the Buda Castle (government initiated), the Városliget in Budapest (government), Normafa in the Buda Hills (local government of Budapest), the Avas lookout tower (Miskolc, local government), Nagyerdei Park (Debrecen local government). These initiatives reached Szeged, too, and the local government first renewed the Park in Újszeged and the area of the City Zoo. Later the local government was responsible for large-scale projects aimed to renew places, which were less frequently visited by tourists: examples include the areas of Vértó, Holt (Dead) Maros and Zápor lakes. One of the main characteristic features of these latter projects was to link the local green and blue infrastructures, and, also to increase the number of tourists and visitors with improved accessiblity. Another common feature of these projects was that they were all aimed to renew the surroundings of significant objects, parts of the country's cultural tourism.

Recognizing it's importance, the researchers of this trend have recently investigated the topic in detail. Some researchers investigate how certain elements determining the perceived properties (atmosphere) of the place affect the person who "consumes" the space (Butsykina, 2024; Eronen, 2023; Vihanninjoki, 2022). The examination of the aesthetic significance (or lack thereof) of green public spaces and their accessories receives considerable attention (Kothencz et al., 2017; Zhang et al., 2024). Researchers attached great importance to the different seating areas in the parks (Grabiec et al., 2022; Liang & Wu, 2024; Abdurrahman, 2024), or changes in the cityscape caused by tourism (Nogués-Pedregal, 2018). Several disciplines focus on one or another aspect of the landscape (environment), investigate and analyze their interrelatedness, but, the visual appearance of the cityscape and the built-in elements have not yet been thoroughly investigated by researchers in Hungary. Our research group (Environmental Aesthetics and Climate Adaptation Research Group in University of Szeged, Faculty of Education) have been conducting research since 2016 in the field of evaluating and typifying settlement and landscape

elements, and assessing and evaluating the factors that cause their change. Our goal is to objectify (quantify) aesthetic values, develop a method for visual mapping, and develop an effective method for settlement leaders, tourism entrepreneurs, and investors that assists in the strategic planning processes (Karancsi et al., 2020; Karancsi et al., 2022; Hornyák et al., 2022; Hornyák et al., 2023). The cityscape is constantly facing challenges in terms of urbanization, technical or environmental impacts. Due to competition between settlements, it is important to constantly monitor changes in our environment and, if necessary, slow down or stop processes that have a negative impact on citizens and tourists. Due to the current inefficiencies of assessment, protection and legal regulation, the view and image of a settlement are one of the most rapidly declining resources.

METHODS

The most important aim of our research in the area of environmental aesthetics is to elaborate a system of criteria which may be suitable for the evaluation of any street view from an aesthetic perspective. It is the buildings and their immediate surroundings (squares, parking areas etc.) that represent the basic factors of any street view. The first task in the process of evaluation is to quantify the looks of buildings and their surroundings, and then, with the help of a simple arithmetic average, it becomes possible to calculate the overall environmental-aesthetic value of a given object or area. From a geographical point of view data collection takes place at micro-level, taking into acount the individual buildings and the calculable sections of streets. The next step is to determine the average figures in relation to the individual groups of buildings, streets, and parts of the cities. All these factors represent a higher level in the process. Finally, when determining the average of various districts within a given city, it becomes possible to identify the aesthetic quality of the entire settlement with a concrete number. This process contributes to the scientific exploration of formerly unknown structural features of the given settlement.

Actually, this method is used to evaluate the view of the given environment. The figure, we get as a result at the end of the evaluation process, comprises several aspects, including the visual value of the given street, district, or settlement. This is why this figure may be called an 'Urban Aesthetic Index'. But, as it has already been outlined, the way we see our environment also determines our relationship to it. In case we have a 'positive' evaluation of our environment, it is perceived as a more 'liveable place'. This is the reason why our team prefer the term Visual Liveability Index (VLI) in research whose focused on Szeged in Hungary (Karancsi et al., 2020; Hornyák et al., 2022; Hornyák et al., 2023). When determining the number of points given for the individual aspects of the environment, we aimed to minimalize the distorting effect of subjectivism. This is why three value selectors were used in our qualifying system. This method seems to have enabled us to determine objectively the individual elements of urban aesthetics in relation to a given area, since number '1' is the lowest point assigned to a building of poor appearance, while number '3' represents the highest value that can be assigned to the various individual aspects of evaluation. Number '2' represents a transition concerning the quality the actual scene represents, underlining minor aesthetic problems. Perfect aesthetic appearance was awarded with 3 points (Table 1, Figure 1).



Figure 1. The determination of core values on the basis of the physical condition of buildings (from left to right): very bad (1 point); average, with some clearly visible aesthetic problems (2 points); a renovated building in perfect condition (3 points) (Source: Authors, 2017)

Table 1. The aesthetic qualification of core- and supplementary values for studies in urban aesthetics (Source: Edited by Karancsi et al., 2017: 307)

Default	**condition of buildings**		1	Building in bad condition (scanty plastering, broken or missing windows, scanty roof)
			2	Building in average condition, minor, but visible degradation (minor cracks on the walls, lack of paint, etc.)
			3	New or renovated building in perfect or in good condition.
	organic streetscape adaptation to the street		1	A building that does not fit in with the streetscape due to its style or design
			2	Building/s with the same roof height, similar facade layout or color matching to the streetscape
			3	Buildings of a similar style, coherent streetscape.
Additional	**touristic significance**		1	A building with an (art)historical character
			2	A building of historic characteristic and/or townscape significance
			3	Monument, or building of (inter)national importance (emblematic buildings)
	street furniture, decoration		1	Bench, planter or street sculpture in good condition.
			2	A catering unit with a smaller terrace (max. 15 people) that fits in with its surroundings (unified streetscape).
			3	A catering unit that fits into the uniform streetscape, has a larger capacity (min. 16 people), and a terrace decorated with plants
	plants	on the street	1	Flowers planted in a balcony box
			2	Young (planted in a box), well-kept woody vegetation
			3	Older, well-kept, woody vegetation (with lawn area)
		visible from the street	1	Young and/or less visible, well-kept vegetation from public areas.
			2	Older and/or well-kept vegetation that is clearly visible from public areas.

A similar method can be used to identify the visual value of vegetation in a certain area. Plants that contribute to the attractivity of a place may be assigned higher points. On the other hand, the ones with a damaging effect on city view, or, the presence of unhealthy, dead, or 'manipulated' trees or alleys are assigned only low points (Figure 2). Based on the general idea detailed above, trees and/or other plants, contributing to the attractivity of a place are awarded 3 points, while those ones which are problematic from one point or another, or, bushy and shrubby vegetations, the visually less attractive places are given 2 points. Places with dead or unhealthy vegetation, or, with plants and trees which do not become the place are assigned 1 point. (There might be cases when a dead tree in well-cared-for surroundings may represent a kind of aesthetic value. On the other hand, this tree does not play any other role in its environment, what is more, in case of storm the wind may uproot it. So, the dead tree poses danger for the environment (Figure 2).

In case it is not only the vegetation that is sick or dead, but the place itself shows signs of neglect, it is evaluated as visual conflict and 0 point is assigned, or point(s) may be deducted.



Figure 2. The determination of core values on the basis of the vegetation state (from left to right): very good (3 points); average, with some visible aesthetic problems (2 points); in very bad condition, or, destroyed (dead) vegetation (1 point) (Source: Authors, 2017)

Concerning the role vegetation plays in the evaluation process, it is important to consider the role plants play in townscape. If a tree, or a plant is in the vicinity of some emblematic building, or, can be found in public areas, frequented by tourists or by the locals themselves, and it is an organic part of the view, then its evaluation plays a more significant role in the overall evaluation of the area (Table 2). In the course of our earlier studies it was primarily the concept of homogeneity of buildings that was primarily considered (Karancsi et al., 2017, 2020). Due to definition problems in defining our benchmark, this task proved to be difficult. Consequently, in our view, the homogeneity of architectural style has to be considered as benchmark in street view evaluations. Those buildings are at the core of these studies, which were built in identical or similar architectural style(s), and which represent the majority in the given street.

Table 2. The aesthetic qualification of core- and supplementary values in city view investigations (Source: Edited by Authors, 2024)

Default	**Condition of plants**	1	Plant(s) in very poor condition (wild, severely mutilated or diseased).
		2	Plant(s) in medium condition, with a minor, visible aesthetic problem (dead branches or noticeable mutilation)
		3	Aesthetic plant/s in good condition
Additional	**Impact on cityscape**	1	Important plant (for the cityscape)

If the buildings considered represent a kind of architectural unity, they are awarded 3 points. In case only some of the characteristic features match (e.g. the colour, or the height of the roof, or some stylistic features), they represent only a partial match. These buildings are awarded 2 points. Finally, in case there is a huge contrast between the individual building and the ones nearby (general street view), only 1 point is given (Table 1, Figure 3).



Figure 3. The identification of core values on the basis of the homogeneity of buildings (from left to right). Lombard Building (modern headquater of financial services company, built in 2005 between traditional buildings in Béla Somogyi Street, Szeged, Hungary): on the basis of its style, or construction does not match the general street view -1 point.; Modern condominium (built mid 20th century between traditional buildings in Oskola Street, Szeged, Hungary): partially matched building (in colour or size) - 2 points.; Traditional buildings (in Kis-Tisza Street in Szeged, Hungary): matching buildings of similar style - 3 points (Source: Authors, 2017)

Actually, the buildings which were given the lowest scores (1 point) in as many as two categories (condition and homogeneity), may represent visual conflicts as well. But, since in our group of evaluation tables there is one, which focuses on visual conflicts by assigning negative numbers as points, this category is being disregarded for the time being.

In case the buildings in one row represented homogeneity in their architectural styles and construction features, then they were not evaluated one by one, but they were assigned one – common – score. As far as the final result of our overall evaluation is concerned, this method did not have any significance on the end result. In addition to the points given to evaluate the formerly detailed core values, there were two cases when supplementary points were given to the individual buildings. Three supplementary points could be given to each individual building if it had a special significance in tourism.

One supplementary point was given to buildings of special significance in art history, two supplementary points to locally protected buildings, or, to listed buildings. Three points could be given in case the building was a national historic building, or, if it had a specific international significance (emblematic building) (Table 1, Figure 4). Although there is no direct relationship between the touristic significance and the aesthetic value of a building, during renovations the listed status of a building is doubtlessly an advantage. Consequently, a closer relationship can be detected between the better condition and the listed status of a building. The final outcome of our research would be a visual map of Szeged, which is to colour-code and display all the streets of the city. Practically, the main beneficiaries of this map would the tourists, who, in addition to having access to the list and the whereabouts of the most spectacular sights of Szeged, with the help of this map would also be enabled to see and visit the most homogeneous-looking local streets. But, it is also possible to disregard the map and concentrate only on the analysis of the visual characteristics of Szeged's streets. The view of a street may be enhanced by benches, flower pots and public statues, as well as by the temporarily operating terraces of catering establishments, features, which can create a special Mediterranean atmosphere during the summer tourist season (Table 1, Figure 5).

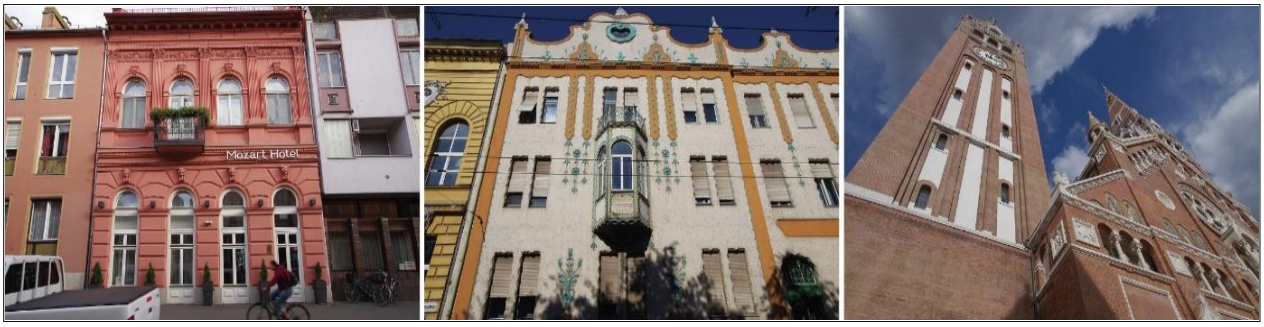


Figure 4. Supplementary points given for touristic values (from left to right) Old inn building of the Oskola Street (Szeged, Hungary) with significance in art history - 1 point; Deutsch Palace, historic building, listed building of local significance (Szeged, Hungary) - 2 points; Votive Church, listed building of national of international significance, emblematic building (Szeged, Hungary) - 3 points



Figure 5. Street furniture, flower pots and street decoration may enhance the aesthetic view a street can offer. Good examples in Kárász Street in Szeged (Source: Authors, 2017)



Figure 6. Supplementary points given for the presence of healthy green plants (from left to right). Oskola street 5 in Szeged, Hungary: plants on the facade of a building, on the balcony and in front of a building (1 point); Old inn building (Oskola Street 16. in Szeged, Hungary) with flowers and young trees in pots (2 points); Tramline 2 in Széchenyi Square (Szeged, Hungary): well-cared-for lawn with older trees and/or flowers (3 points)

Healthy plants are of special value of significance; when evaluating the city view, they represent added value. This is why their presence is worth of a maximum of 3 points. No point is given at all if there are no green plants in the given area, 1 point is given if their presence is restricted to mere decoration and they are only on balconies of houses. 2 points are awarded if there are woody plants, too, including thujas in flower pots at the entrance of houses. 3 points are given if there are well-cared-for lawns and/or older trees in the neighbourhood of the given building (Figure 6). When evaluating green areas it is important to make a distinction between the plants which are actually parts of a public area, and those, which can only be seen from the given public area. (It may be a point of significance when evaluating suburban areas) (Table 1).



Figure 7. Examples of visual conflicts in Szeged (form left to right): a – sick plants, b – graffiti, c- litter, dust, stink, d – damaged sidewalk, e – catenaries, f – advertising (Source: Authors, 2017)

In this evaluation system the basic values a building might earn is a maximum of 3+3=6 points, while as far as the supplementary categories are concerned, a maximum of 3+3+3+2=11, which means a total of 17 points. But our team intended to consider visual conflicts as well, the presence of which might lessen the aesthetic value of the given area. Those visual conflicts, which could be documented were enlisted and then a certain number of points was deducted from the above detailed total. One point was deducted for minor conflicts and two for more serious conflicts. The list of potential visual conflicts used in our evaluation system is as follows: neglected green areas; graffiti; broken bench, dirt, litter, broken – dangerous – sidewalk pavement; aerial wires, advertisements, advertising boards; noise, dust, fumes from intense traffic (Table 3, Figure 7).

Table 3. The qualification of visual conflicts (Source: Karancsi et al., 2017: 311)

Visual conflicts Additional	**Sick plants**	-1	Minor visual conflict
		-2	Severe visual conflict
	Graffiti	-1	Minor visual conflict
		-2	Severe visual conflict
	Damaged street furniture	-1	Minor visual conflict
		-2	Severe visual conflict
	Litter, dust	-1	Minor visual conflict
		-2	Severe visual conflict
	Damaged sidewalk	-1	Minor visual conflict
		-2	Severe visual conflict
	Advertising	-1	Minor visual conflict
		-2	Severe visual conflict
	Vires and catenaires	-1	Minor visual conflict
		-2	Severe visual conflict
	Traffic noise	-1	Minor visual conflict
		-2	Severe visual conflict
	Stink	-1	Minor visual conflict
		-2	Severe visual conflict

It is important to note that we were and still are aware of the fact that some of the visual conflicts are of temporary nature: dirt or litter seen one day in the given street, might be gone for the next day. Graffiti, or advertisements take longer, several weeks to disappear. It might take months to repair a sidewalk pavement. At the same time there are some temporary conflicts, including noise, air- or dust pollution in the peak hours, or, some unpleasant smell which may affect liveability in a negative way, but, which very rarely disappear on their own. For example the unpleasant smell is often linked to the presence of garbage, to uncleaned, dirty streets, or to excess traffic, which, in most cases is the major cause for noise, dust,

or air pollution. All these factors have an influence on city view as well. This is why it is of utmost importance for all parties concerned, to underline the hidden dangers which might destroy city view and liveability.

The final number of points the individual buildings were given in our evaluation consists of the sum of scores given for the basic and also for the supplementary values. Then the points given for occasional visual conflicts were deducted from the former result (-1 or -2 points). In addition to the members of the research team, the evaluation was also carried out with university students from different disciplines. This relatively simple evaluation system helped us to achieve that during the evaluation process no major differences were to be found concerning the points given by the individual evaluators. The differences were practically negligible, meaning, that subjectivity played only a negligible role.

We divided into 'visual units' those non-traditional streetscapes, which are partially bordered by green spaces, closed by roads and houses. These visually coherent units are located in roughly the same area that a person can observe from one place. On the other hand, these units are separated by 'boundaries', meaning, that their interdependence is weaker, or, at places, there is a kind of barrier, physically separating them. In most cases the boundaries separating the visual units with buildings are (but not always) streets. In larger parks there are fewer concrete boundaries, so in these areas it was the functions of the chosen area that served as basis for our research. We have subdivided for example our sample area into five visual units. Each unit was evaluated twice: first the features of the area itself, then the characteristics of their spatial boundaries.

Sample area

The sample area of research targeted at is situated in the city centre of Szeged, stretching along the Tisza River. The area itself was formed during the Great Flood of 1879, at a place where the Castle of Szeged used to stand (Figure 8). In this area the location of the network of streets and the architectural style of the new buildings were determined by a governmental committee. According to the committee's decision representative buildings, typical in big cities were to be built to replace the ruins of the Castle. This urbanized style was further emphasized by the size of the buildings, too, all of which were larger than the ones in the city's main square. Another feature was the alternation of public and private buildings and the establishment of a public park, actually a promenade. Due to these features, the area, called Stefánia was to become the most elegant residential and office quarter of Szeged. The most emphatic building of its street view is the building of the National Theatre. By its size it stands out of the group of other buildings. In this area another dominant building can be mentioned, the building of the Hungária Vigadó, which is the last one in this section of street.

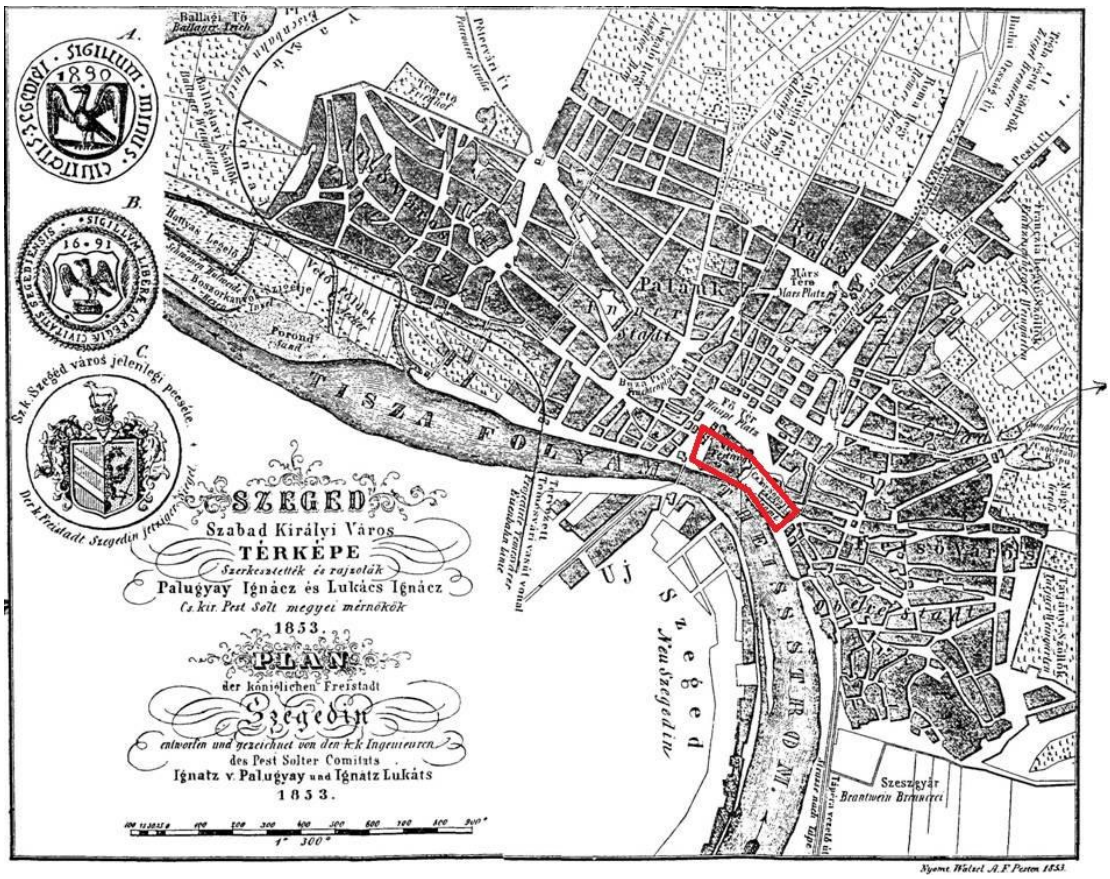


Figure 8. A west-facing map of Szeged, a free royal town. The sample area is marked with colour red (Source: Palugyay – Lukács 1853)

The neighbouring Oskola Street, which is located in the vicinity of our current sample area, has already been investigated by our research team (Karancsi et al., 2017; Hornyák et al., 2023). Actually the area of Stefánia has been selected for research and analysis. because it had already been studied, prior to its reconstruction, too. A rich collection of photographs and documents are at our disposal from that period, all of which represent valuable resources for this new research.

The majority of the buildings in the surveyed area were built after the Great Flood of Szeged of 1879, a period, when the entire city was rebuilt. Almost each building was one or another type of protected building by the time our survey began. The only exception can be found at one end of the area, it is the so-called Égő Arany (Burning Gold) House, and a smaller adjacent building, both of which were built in the 1960s. The majority of sculptures, which are in the park, are also nationally or locally protected works of art. The trees and plants of Várkert, Mórapark and Roosevelt Square are also locally protected.

The area we surveyed can be found in the vicinity of the main tourist attractions of the city, although it is not part of Szeged's main sights. Roosevelt Square can be found at its southern end, while on the north it is bordering on one of Szeged's boulevards, a street, which marks the end of the inner city. Kárász Street, Szeged's main pedestrian and shopping street is at a distance of 220 meters, while the other favourite area for walks, the promenade along the river represents the riverside borderline of Várkert, part of our sample area. Near this area there are places of utmost importance for cultural tourism, too, including the Ferenc Móra Museum and the formerly mentioned National Theatre.

The Open Air Theatrical Festival, organized in Dóm Square, a nearby place, as well as the annual Bridge Fair, other programmes organized in Széchenyi Square and the Fish Soup Festival of the embankment area are all cultural events, which have a seasonal influence on the traffic of our sample area as well. The distance from the southern end of Várkert to the emblematic Dóm (Votive Church) is 300 meters. According to a survey, conducted in 2018, the formerly mentioned section of the area called Stefánia was the busiest bicycle path in Hungary (Szabó, 2021).

It can be explained by the facts that the area is the heart of the inner city, and, also that several faculties of the university are nearby. When our first survey was conducted in connection with this area in 2017, there was high traffic in this area (Karancsi et al., 2017). Office workers as well as employees of several university institutions, located in our sample area, used their cars to get to their destination. Entry and the parking of passenger cars was then tolerated to some extent. This fact has led to the worsening condition of the green areas as well.

The reconstruction of the area had several stages and several investors were included in these works. The large scale reconstructions of the 1990s came to an end by the 2010s. Later, the local governments preferred smaller-scale investments and, instead, gave more opportunities to the representatives of individual businesses. The reconstruction of Kárász Street, the pedestrian street of Szeged involved the reconstruction of the interior part of the buildings and the settlement of ownership issues as well. During the two decades between 2000 and 2020 the local government led the reconstruction of several items in the Várkert area with an aim of reducing car traffic.

On the other hand, the changes did not focus on the Várkert area exclusively; on the long run the local government aimed to introduce the concept of a car-free inner city area. It was the regional water directorate that had the promenade between Várkert and the Tisza River reconstructed in the year 2015. In 2020 the Museum gardens were renewed, while in 2021 the pavements of the entire Stefánia area were reconstructed. The 'main street' of Stefánia makes it possible for car traffic to avoid the city's main square. Cars using the inner city bridge can turn into this street. Reconstruction works took place using the so-called wall-to-wall method, widespread in Hungary, but during these works those measurements were not taken which would significantly have reduced motorized traffic. The area of Stefánia has to cope with the trolleybuses of two suburban services, too, consequently, the reduction of traffic would have been counterproductive by reducing the significance of public transport. This is why, when rethinking the issue of transport in the area of Stefánia, a less disturbing and less polluting kind of transport, bicycle traffic was prioritized. The former bicycle path on one side of the road was made into a directional bicycle path located on both sides of the street. Earlier it was possible to park in the street, but, in 2021 the city – although they lost part of their revenue – banned parking on the interior side of Stefánia. In the outer areas it is still possible to park, but the number of places has been reduced.

Rethinking the green and the blue areas

The surveyed area is definitely a green area, although, the whole area cannot be called a park. The green surfaces were involved in the reconstruction works as well. During the past few decades the attitude of the population to reconstruction works has changed, too. Citizens increasingly say no to the idea of bringing about stone-covered large areas or they reject the concept of reconstruction when it is aimed at reducing the size of green areas. A similar change of attitude can be seen concerning the issue of blue surfaces. In Szeged it was a kind of historical tradition to liquidate water surfaces from the inner areas of the city. This process is now simply not possible, and, it is not expedient either. In the time of the reconstruction works the concept was that the green and blue surfaces were not to be eliminated from the area, but, instead, they were to be linked using their synergies, they had to be integrated in city life and made accessible to residents and also to tourists. It is important to note that it is not only the visible blue surfaces that were concentrated on, but there was also the will to use rain water locally. For example, walking surfaces were made from water pervious material.

Access to both types of surfaces has improved significantly. For example, several new walking paths were established in the Várkert area, so, passing through became much easier. New sitting and training benches, drinking fountains and playground equipment was made accessible in numbers exceeding their former numbers. It is obvious that the green areas serve free time activities, but, in addition, they serve as background to enjoyable and useful pastime. It is not only the opportunity to have access to green and blue areas physically, but by creating the possibility to spend time in these areas with multiple actvities, the length of time spent outdoors increased. Consequently, the area has become attractive for members of various social groups (Figure 9). A mobile defense system was established to replace the former river wall made from reinforced concrete, so, the river itself was made more visible for people. Although the Tisza River and the park are still separated by a metal rail, but it is a see-through arrangement; the river can be seen, perceived and heard. From the point of view of cityscape it is an important change, that the edge of the basin of the fountain in Ferenc Móra Square was

removed, so it is possible now to 'walk through' the fountain. Thus a direct, physical relationship exists between visitors and water. In addition, other decorative fountains have been designed and placed in the park.



Figure 9. Benches designed for visitors with various needs (form left to right): Green area of the Stefánia, Playground and park of Roosevelt Square, Szeged, Hungary (Source: Authors, 2017)

When writing this paper some planning is in the making to 'humanize' the area of the embankment, stretching between the inner city and the Tisza River. According to these preliminary plans in the not-so-distant future parking would be banned (further 80 places), and, later, through traffic would be eliminated. The area of the embankment would be used for cultural events and leisure time activities. This change would mean the extension of the size of green areas, and the previously mentioned area, the Várkert would stretch as far as the Tisza River.

RESULTS

The reconstruction of buildings and the renewal of the green areas followed the same logic. When dealing with the representative objects, typical of the given area, the most important aim was to preserve their primary function, the city view, but a kind of visual improvement was also targeted at. During these processes no work was done which could have radically changed the function of the object, or, the loss of its traditional characteristic features. The reconstruction work aimed to protect the visible valuable features of the buildings and also intended to present them in a sustainable way.

An object, an integral part of the area could only be changed, if the new object was capable of taking over the function of the former one without any limitation. Those objects, which were not typical of the area, or, which have lost their function, or, which were mismatched, had to disappear. This way the area was deprived of many visual conflicts and could easily be seen through. As a result of reconstruction, it is worth paying attention to the spatial order of the inner city area in Szeged. According to our former survey the points given to Ferenc Móra Park, a representative area of the city, were higher than the scores of other reconstructed and renewed areas. The improvement of cityscape is a general feature, but it is not an uninterrupted and even development. The representative areas of the city scored higher in the period of our former survey, but interestingly, their advantage was lessened due to the new investments.

It can be seen clearly that within the Várkert area the most significant investments took place where formerly the conditions had been better. The largest amounts of money were very likely to have been spent on the playground, located in Visual unit No. 1, and on the fountain complex of Visual unit No. 2 (Figure 9, Figure 10). Those parts of the green areas, which were less frequented the improvement was not due to new investments, but to the elimination of former visual conflicts. The value of investments was not evenly distributed in the area, but investors concentrated on the most representative places. In spite of this feature the most spectacular improvements can be found in the formerly neglected areas. Although the visual value of the most representative areas (Visual unit No. 1 and 2) has improved, too, but the most significant improvement is typical of the less representative places (Visual units No. 3, 4 and 5).

Observations concerning the green areas:

During the past few years the sick trees were cut down. All those woody plants have gone which were identified as visual conflicts of significance during our survey of 2017.

- All those trees were removed, too, independently of their size, which grew wildly and did not belong to the park.
- Those visual elements were abolished which would have needed uninterrupted care.
- During park maintenance works it is not an aim any longer to have an 'English style' lawn. The lawn surface is watered only in more representative areas, at other places they seek to let rain water infiltrate.

The evaluation of the space walls and the public areas in front of them

The area of the park was divided into 5 visual units (Figure 10). Within the green areas the ramp of the Belvárosi bridge and the building of the Ferenc Móra Museum, with its vertical positioning in relation to the longitudinal axis of the park, are obvious dividing lines. The further, internal division of the park into units cannot be done so easily. In this case buildings of importance and the internal functional characteristics of the park were considered. These units have more or less identical functions. Visual unit No. 1 is the most significant playground in Szeged. Visual unit No. 2, a

representative public area, serves as a foreground to a building, which is wellknown nationally. Visual unit No. 3 represents the immediate surroundings in the vicinity of the remains of the Szeged Castle. It is mainly a pedestrian zone. Visual unit No. 4 is primarily frequented by the younger generations and it is a scene for their play and sports activities.

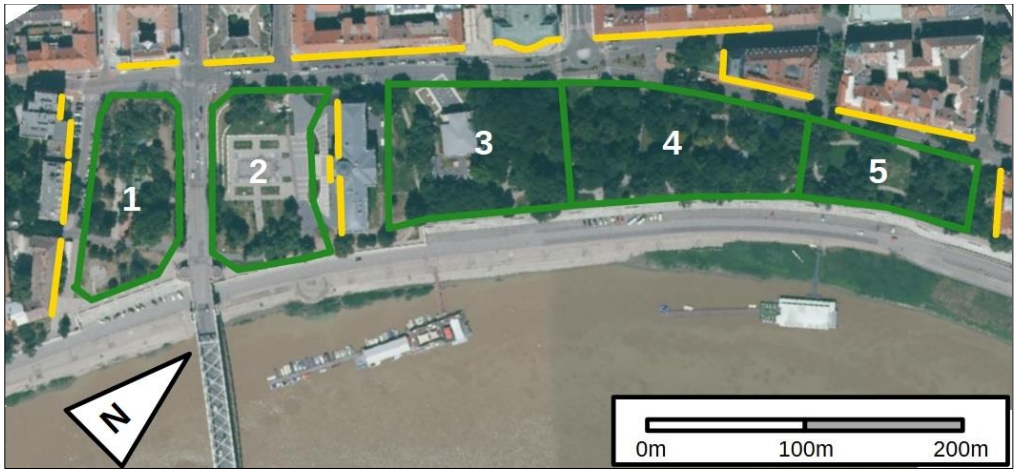


Figure 10. The surveyed area and its visual units (Source: Edited by S.J. Hornyák from MEPAR 2024)

Visual unit No. 5 is the foreground to Szeged's Trade School, and as such, it practically serves as a meeting point for secondary school teenagers. The results of the survey for each visual unit at two dates (2017 and 2023) are presented in tabular form below. With modified criteria compared to the original datasheet, we have evaluated the built environment and the park environment associated with the visual unit in separate tables. First, we evaluated the buildings that border the visual units' square walls, as in our previous study (Tables 4, 5, 6, 7, 8).

Table 4. The qualification of visual conflicts of the building of Visual unit No.1 (Source: Authors, 2023; 2024)

								
Number	1.		2.		3.		4.	
Name of structure	**Roosevelt Square 14.**		**Roosevelt Square 10-11.**		**Roosevelt Square 8-9.**		**Roosevelt Square 7. „Burning Gold"**	
	2017	2023	2017	2023	2017	2023	2017	2023
Condition	2	2	2	2	2	2	2	2
Coherence	3	3	1	1	1	1	1	1
touristic importance	**1**	**1**	-	-	-	-	**1**	**1**
street furniture	-	**1**	-	-	-	-	-	-
plants	-	**1**	**1**	**1**	**1**	**1**	**1**	**1**
neglected or sick vegetation	-	-	-	-	-	-	-	-
grafitti	-	-	-	-	-	-	-	-
littering, dust	-	-	-	-	-	-	-	-
damaged sidewalk	-1	-	-1	-1	-1	-1	-1	-1
cover, disturbing objects	-	-	-	-	-	-	-	-
traffic and noise	-	0	-1	-1	-1	-1	-	-
stink	-	-	-	-	-	-	-	-
aggregated value	5	8	2	2	2	2	4	4

Table 5. The qualification of visual conflicts of the building of Visual unit No.2 (Source: Authors, 2023; 2024)

			
Number	5.	6.	7.
Name of structure	**Roosevelt Square 6. Péter Tóth House**	**Roosevelt Square 5. Milkó Palace**	**Roosevelt Square 1-3. Ferenc Móra Museum**

	2017	2023	2017	2023	2017	2023
Condition	1	3	2	3	2	3
Coherence	3	3	3	3	3	3
touristic importance	**2**	**2**	**2**	**2**	**3**	**3**
street furniture	-	-	-	-	-	-
plants	-	**1**	-	**1**	**3**	**3**
neglected or sick vegetation	-	-	-	-	-1	-
grafitti	-1	-	-	-	-1	-
littering, dust	-1	-	-1	-	-1	-
damaged sidewalk	-1	-	-1	-	-1	-1
cover, disturbing objects	-	-	-	-	-	-
traffic and noise	-1	-1	-1	-1	-1	-1
stink	-	-	-	-	-	-
aggregated value	2	**8**	4	8	6	**10**

Table 6. The qualification of visual conflicts of the building of Visual unit No.3 (Source: Authors, 2023; 2024)

										
Number	8.		9.		10.		11.		12.	
Name of structure	**Stefánia 1. Burger House**		**Stefánia 2. Politzer House**		**Stefánia 3. Abafi House**		**Stefánia 4. Rósa House**		**Stefánia 5. National Theater**	
	2017	2023	2017	2023	2017	2023	2017	2023	2017	2023
Condition	2	3	2	3	2	2	2	2	3	3
Coherence	3	3	3	3	3	3	3	3	3	3
touristic importance	1	1	1	1	1	1	1	1	3	3
street furniture	-	-	-	-	-	-	-	-	1	1
plants	-	1	-	1	-	1	-	1	2	2
neglected or sick vegetation	-1	-	-1	-	-1	-	-	-	-1	-
grafitti	-	-	-	-	-	-1	-	-	-	-
littering, dust	-	-	-	-	-	-	-	-	-1	-
damaged sidewalk	-1	-	-1	-	-1	-	-1	-	-	-
cover, disturbing objects	-	-	-	-	-	-	-	-	-1	-
traffic and noise	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
stink	-	-	-	-	-	-	-	-	-	-
aggregated value	3	7	3	7	3	5	4	6	8	**11**

Table 7. The qualification of visual conflicts of the building of Visual unit No.4 (Source: Authors, 2023; 2024)

								
Number	13.		14.		15.		16.	
Name of structure	**Dózsa Street 1. Pfann House**		**Dózsa Street 2. Hungarian Radio Building**		**Dózsa Street 3. Deutsch Palace**		**Stefánia 8. „Hungária”**	
	2017	2023	2017	2023	2017	2023	2017	2023
Condition	2	2	2	3	2	2	2	2
Coherence	3	3	3	3	3	3	3	3
touristic importance	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**
street furniture	-	-	-	-	-	-	-	**1**
plants	-	**1**	-	-	-	-	**1**	**1**
neglected or sick vegetation	-	-1	-	-	-	-	-	-
grafitti	-	-	-	-	-	-	-	-
littering, dust	-	-	-	-	-	-	-	-
damaged sidewalk	-1	-	-1	-	-1	-1	-1	-
cover, disturbing objects	-	-	-	-	-	-	-	-
traffic and noise	-1	-1	-1	-1	-1	-1	-	-
stink	-	-	-	-	-	-	-	-
aggregated value	4	5	4	6	5	5	7	9

Table 8. The qualification of visual conflicts of the building of Visual unit No.5 (Source: Authors, 2024)

								
Number	17.		18.		19.		20.	
Name of structure	**Stefánia 9.**		**Stefánia 10. Vajda Palace**		**Stefánia 11.**		**Stefánia 13. Commerce School**	
	2017	2023	2017	2023	2017	2023	2017	2023
Condition	2	2	3	3	2	1	2	2
Coherence	3	3	3	3	3	3	3	3
touristic importance	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
street furniture	-	-	-	-	-	-	-	**1**
plants	**1**	**1**	-	-	**1**	**1**	**2**	**2**
neglected or sick vegetation	-	-	-	-	-	-	-	-
grafitti	-	-	-	-	-1	-1	-	-
littering, dust	-	-	-	-	-	-	-1	-
damaged sidewalk	-1	-	-1	-	-1	-	-1	-
cover, disturbing objects	-	-	-	-	-	-	-1	-
traffic and noise	-	-	-	-	-	-	-	-
stink	-	-	-	-	-	-	-	-
aggregated value	6	7	6	7	5	5	5	9

The results show where renovation and conservation work has been done in the last 7 years. The most striking change can be seen on Péter Tóth House, number 5 in visual unit 2, which was in a very poor state of repair due to decades of decay, and finally, Vántus István Music Secondary School of the Gál Ferenc University will have completely renewed it in 2023. In addition to a complete renovation of the building, the surroundings were also renewed, improving the building's score by 6 points compared to the 2017 evaluation. This renewal was also very important because it is the first building seen by the people coming to Szeged from the main road 43 via Újszeged and the Belvárosi bridge and the first impression is always very important. The National Theatre, the city's most prominent building in the visual unit No. 3, received the most points (11), with 3 points more than in 2017, mainly due to the improvement of its surroundings.

In second place, with 10 points, was the Móra Ferenc Museum, one of Szeged's emblematic buildings, which is part of visual unit No. 2 and is known nationwide. Although it has also undergone renovation and the removal of visual conflicts in its surroundings, it managed to improve "another" 4 points compared to 2017.

The evaluation of park areas

The second part of the study we assessed the condition of the parks (Table 9). When renewing the green areas the sick and wildly grown trees were cut down and new ones were planted to replace them. The plants, causing problems disappeared and their disappearance resulted in a feeling of absence, and, at the same time, it opened new possibilities. (The line of linden trees, which were cut down at the bridgehead was missed by many people, but, at the same time, now the gigantic, formerly hidden facade of the museum building is clearly visible for passers-by.

One of the sick sycamore trees in front of the Sefánia was cut down, too, and this fact also could have enhanced the view of the building hidden behind it, but, unfortunately, the facade of that building is in a very poor shape.)

Table 9. Evaluation of park areas (Source: Authors, 2024)

										
Name of area	Roosevelt Square		Móra Square		Várkert 1		Várkert 2		Várkert 3	
Number of park areas	1		2		3		4		5	
	2017	2023	2017	2023	2017	2023	2017	2023	2017	2023
Plants	2	3	2	3	2	3	2	3	2	3
Street furniture	1	2	1	2	-	-	1	2	1	2
Path's surface	1	2	1	2	1	2	1	2	1	2
disturbing objects	-	-	-	-	-1	-	-1		-1	-
Litter	-	-	-	-	-	-	-	-	-	-
Grafitti	-1	-	-	-	-	-	-1	-	-1	-
Dust, noise	-1	-1	-2	-1	-	-	-	-	-1	-
sick plants	-1	-	-1	-	-1	-	-	-	-	-
aggregated value	1	6	1	6	1	5	2	7	1	7

Although the absence of trees can be felt in these places, but the young trees, which were planted to replace the sick ones and which will grow, after a time will be able to hide the 'scar'. It needs to be mentioned that the bushes and shrubs were almost fully eradicated. Due to the absence of bushes and shrubs the entire area of the park became transparent. This feature means a kind of duality in the area of the Várkert (Table 9).

On the one hand people can see tree giants, recalling natural forests, but, on the other hand, the area does not remind observers of natural forests. It makes the impression of an old, sterilized plantation of trees. This impression cannot be changed by the fact either that the park management abandoned the former futile attempts to have regularly mown lawn.

Another advantage of the area is the elimination of the former large-size flower beds, which needed regular intensive care. The new visuals, the see-through park itself compensate for the absence of old-style flowerbeds.

The results also show that the renewal of vegetation played an important role in all visual units, as well as the strengthening of the recreational function of the park through the use of renovated (newly installed) furniture and other equipment. In each of the 5 visual units studied, the renovations have eliminated the most visual conflicts, which is also reflected in the 2023 scores. It can be seen clearly that, as a result of reconstruction some of the individual problems were not solved. Although parking was made more difficult in the area and it may have resulted in fewer vehicles, but this fact was not clearly identifiable when looking at the total figures. The problem, caused by the motorized traffic of individuals is stubborn and its solution in the centrally located areas, including the Várkert area, is difficult. During our fieldwork the most disturbing feature of Visual units 1 and 2 was the noise caused by traffic. In order to solve this problem the local government does not have the proper financial and political power and the way we see it, the problem will be solved only in the future, as a result of changes in transport policy and technological progress.

Investments into the Várkert area were seemingly disproportionate. In the areas with the largest investments improvement was of lesser extent, than in areas with more modest investments. In our opinion this is a contradiction, but only at first impression, since similar phenomena can be onbserved in different walks of life. Preparing a sportsman for Olympic championship requires a lot of investments, too, on the part of the given country. In case the same amount of money would be spent on mass sport or the improvement of sports facilities for everyday citizens, then the result would be a generally fitter, healthier nation. On the other hand, this latter result is much less spectacular. It can be supposed, too, that larger green areas could have been improved and made more accessible if the same amount of money had not been spent on the spectacular items of the reconstruction work in the Várkert area. It should also be noted that a more spectacular result can be achieved by rehabilitating more easily accessible areas in poor condition, by eliminating the visual conflicts there.

Table 10. The Visual Livealibity Index (VLI) of the visual units, 2017 and 2023 (Source: Authors, 2024)

Visual unit No.1							
	buildings				park	aggregated value	**VÉI**
2017	5	2	2	4	1	14	**2.8**
2023	8	2	2	4	6	22	**4.4**

Visual unit No.2						
	buildings			park	aggregated value	**VÉI**
2017	2	4	6	1	13	**3.2**
2023	8	8	10	6	32	**8**

Visual unit No.3								
	buildings					park	aggregated value	**VÉI**
2017	3	3	3	4	8	1	22	**3.6**
2023	7	7	5	6	11	5	41	**6.8**

Visual unit No.4							
	buildings				park	aggregated value	**VÉI**
2017	4	4	5	7	2	22	**4.4**
2023	5	6	5	9	7	32	**6.4**

Visual unit No.5							
	buildings				park	aggregated value	**VÉI**
2017	6	6	5	5	1	23	**4.6**
2023	7	7	5	9	7	35	**7**

We looked at the Visual Livealibity Index (VLI) of each visual unit, which is the arithmetic mean of the values of the buildings that border the units and the parks that make up the largest part of the units (Figure 10, Table 10).

By calculating the VLI, all but the first visual unit scored higher (the 2023 assessment) than our previous assessment on Oskola Street (VLI 5.5) (Karancsi et al., 2017), in which the renewal of the park units played a significant role.

Thus, the visual appearance of one of the city's representative streets is understandably inferior to the visual units lined with renovated parks and palaces. In other words, it can be seen that well-maintained green spaces play a very important role in the perception of visual amenity.

Summary

The improvement of the attractivity of green areas is closely related to their touristic significance. Although, our surveyed areas in the park improved to the same extent according to their scores, but when comparing them, two of the

green areas (No. 1 and 2) had significant differences concerning their degraded condition. These two areas represent places, which are frequented by tourists, and significant problems occurred due to increased traffic, dust and noise pollution. Plants of these areas mostly died as a result of these conditions.

The lesson to be learnt from the second survey and evaluation is that the method is also suitable for following the changes in city view. It was especially true when considering the reconstruction of our sample area, a project, which was 'more than a mere reconstruction, but less than urban rehabilitation'.

As far as the evaluation method is concerned, it can be seen that the scores have to be carefully dealt with. They have to be considered together with their explanations if we want to get a realistic picture of the genuine visual value of the given place. By changing the significance of the individual items or the parking rules, or the presence or inclusion of some visual elements (advertising boards or lifting the ban on parking) may be suitable for changing the overall picture of the street view, what is more, in certain cases it might hide the negative effect of changes (Karancsi et al., 2013).

It is important to add, too, that in addition to the previously described evaluation of the visual elements in street view, in order to grant the complexity of research, it is essential to conduct a survey among local residents as well, with the aim of having their qualification of the state of their own environment. In case of developments aimed at improving local tourism it is also important to investigate those sights and elements which serve the comfort and interest of tourists. This research could be a questionnaire-based survey, and in case of local residents, its results would largely depend on those visual elements, which serve liveability. Our current research was not intended to investigate this latter point of view.

The quantification provided by the method, the narrow scale, allows us to minimise subjectivity, but we cannot claim to exclude it completely. The method is simple, can be used to identify micro-spaces, visual units, to detect visual conflicts, and is also suitable for tracing the changes. On the basis of our research it can be stated that in the area of urban development it is worth investing into improving some less frequently visited, and from the point of view of tourism, less emblematic places. Although these areas do not attract a lot of tourists, but they may contribute to the improvement of the urban landscape in general and, importantly, not much investment is needed to achieve good results.

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EXPLORING THE DETERMINANTS OF SUSTAINABLE TOURISM IN KARST CAVE GEOTOURISM: IDENTIFYING CAVE TOURISM IN INDONESIA

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Abstract: Indonesia's vast karst landscape offers great economic potential through geotourism development. However, excessive exploitation poses a risk of environmental damage, making a sustainable approach essential to ensure environmentally, socially, and economically responsible management. This study explores the factors that influence the achievement of sustainable tourism in karst cave geotourism in Jomblang Cave, Gunungkidul, Yogyakarta. Its contribution is to develop a model to reveal the achievement of sustainable tourism in karst cave geotourism. This study adapts the Modified Geosite Assessment Model (M-GAM) variables with the addition of safety and enjoyment variables as a novelty. These factors have not been explicitly emphasized in prior geotourism evaluation frameworks, despite their strong influence on visitor satisfaction and behavior. Incorporating them addresses a critical gap and aligns the model more closely with real-world visitor expectations. It uses survey and non-probability methods, especially convenience sampling, and 310 valid respondents were obtained. Confirmatory factor analysis (CFA) was used to analyze the construct's validity and reliability, and partial quadratic structural equation modelling was used to test the hypothesis using SmartPLS 3 software. The analysis found that the model could explain 72.2% of the variance in achieving sustainable tourism. The tested factors, namely education, aesthetics, protection, function, tourism, safety, and enjoyment, significantly impact sustainable tourism in Jomblang Cave. This indicates that a multidimensional approach, combining environmental, social, and experiential values, is essential for karst geotourism success.Tourism management implemented in Jomblang Cave successfully moderates other factors in this direction. These results contribute to the existing literature on sustainable tourism and pave the way for further development of Jomblang Cave tourism to fit the karst geotourism strategy concept framework. This enrichment refines geotourism models by prioritizing visitor experience while maintaining conservation, and supports adaptive planning aligned with evolving visitor needs. This approach helps preserve Jomblang Cave's natural heritage while making it a valuable educational and experiential destination. Collaboration with local communities and conservationists promotes sustainable tourism that benefits the environment and the local economy.

Keywords: Sustainable tourism, Karst geotourism, Jomblang Cave, M-GAM, Safety, Enjoyment, Confirmatory factor analysis, Structural equation modeling, Geosite evaluation,

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INTRODUCTION

Indonesia has 154,000 km of karst, creating many cave chains that have developed into geotourism with tourist activities such as cave tours (Ministry of Environment and Forestry, 2017). One popular cave trekking is Jomblang cave, located in the karst mountains of Jetis Wetan hamlet, Pacarejo village, Semanu sub-district, Gunung Kidul, Yogyakarta. The characteristics of Jomblang Cave are unique, as it combines vertical and horizontal caves with a depth of about 80 meters from the ground. Jomblang Cave has a fascinating natural landscape, and the tradition of working together that continues to be carried out has become a natural tourist destination with local, domestic, and foreign tourists. However,

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cave trekking activities risk excessive exploitation and damage to nature, and the growing foreign culture will damage traditions if not appropriately managed. Several tourist destinations have experienced exploitation after becoming popular, including Bali. The present condition of Balinese society is a fundamental socio-cultural transition. The acceleration of the information wave of globalization has brought significant transformations to Balinese society, both at the surface structure level (attitudes and patterns of behaviour) and deep structure (value system, outlook on life, philosophy, and beliefs). If not managed properly, these problems will also occur in karst cave geotourism in the community and the environment.

Conversely, cave exploration is also categorized as a high-risk tourism activity for tourists. The closed terrain conditions, total darkness, complex cave systems, unique surface environment, surface environmental climate, character, and geological activity pose a risk to activists. Even so, when an accident occurs, it should not be blamed on natural factors because almost all are human errors, even though the threat comes from natural factors. The safety factor of tourists is crucial, considering the incidents of tourist accidents in several high-risk destinations. Tourists fell from a 40-meter cliff and suffered broken bones and legs at Broken Beach Cliff in Bali. Another accident also occurred at the Tumpak Sewu tourist destination, where tourists slipped from a 15-meter cliff and died. Accidents can also happen in Jomblang cave, with the vertical cave height reaching 80 m and the horizontal cave passage length reaching 260 m, threatening the safety of tourists. If considered, safety factors will protect the image and interfere with achieving sustainable tourism in Jomblang cave geotourism. Therefore, it is necessary to research sustainable tourism in karst cave geotourism. Sustainable tourism is the development of the concept of travelling that can have a long-term impact on the environment, society, culture, and economy (Ministry of Tourism of the Republic of Indonesia, 2009). This research is expected to provide recommendations to tourism managers in determining their marketing strategies and help the government formulate more appropriate policies. These facts can be the main reason for asking the following research questions: RQ1. What are the determining factors for achieving sustainable tourism in karst cave geotourism? RQ2. How can sustainable tourism in Jomblang Cave be achieved?

Sustainable tourism development in previous studies was developed by fulfilling four factors: attraction, amenity, accessibility, and ancillary called 4A (Christensen et al., 2021; Mundet et al., 2022). Meanwhile, the model development for karst-based tourist destinations that has been carried out is not limited to the 4A factors but also considers the conceptual framework of karst geotourism strategies, including educational, socio-economic, and protection perspectives (Cvetanović et al., 2024; Roig et al., 2023). Some studies use scientific, academic, aesthetic, recreational/tourism, functional, and protection factors (Nazaruddin, 2020; Reinhart et al., 2023; Yulian et al., 2023). The study adopted the Modified Geosite Assessment Model factors, which can measure and discover the potential of karst geotourism (Antić et al., 2020). Other research uses cultural, economic, and biological factors (Mastika et al., 2023; Tamang et al., 2023; Ziem et al., 2023), socio-politic (Singtuen et al., 2022), anthropogenic (Carrión-Mero et al., 2021). The research that has been done attempts to identify the potential of geotourism resources and their development so that managers can provide good tourism services for tourists while maintaining the geosite to achieve sustainable tourism. Previous studies have mostly focused on protecting sites to achieve sustainable tourism, while efforts to create memorable tourist experiences have not been widely discussed. The tourist experience will have an impact on the image of tourist destinations. Creating a tourist experience is approached by paying attention to tourist safety and enjoyment factors.

Safety is an important factor that travellers consider when making decisions, especially when visiting unfamiliar destinations (Peng et al., 2024). When safety indicators are lacking or do not meet expectations, tourists generally perceive a tourist destination as less safe (Zou & Yu, 2022). Previous research has shown that safety is part of a tourist destination's image (Chauhan et al., 2019; Xie et al., 2022). The enjoyment factor also impacts the tourist destination image, creating a travel experience that tourists will remember. A memorable travel experience can be key to tourism marketing and traveller retention (Chen et al., 2020). Many travellers intentionally look for unforgettable and unique travel experiences ((Chen et al., 2020; Marzo-Navarro et al., 2024) to fulfil satisfaction in travelling. Travel experiences are becoming a new strategy to create traveller loyalty (Bai et al., 2023; Stemmer et al., 2022).

Considering the existing gaps in the literature, this study aims to investigate the main determinants that explain the factors influencing the achievement of sustainable tourism in karst cave geotourism. This research focuses on achieving sustainable tourism in karst cave geotourism, as karst features are one of the most vulnerable geosites due to their fragility. Due to the many benefits that local communities can derive from geotourism, both marketing and planning of karst cave geotourism should be carefully applied to bring the concept of sustainable welfare into geotourism (Antić et al., 2020). According to the facts and literature above, using sustainable tourism as the dependent variable is appropriate for this study.

This research has four contributions to the present study. First, the literature on factors influencing tourism is adapted to the conceptual framework of karst geotourism strategies, including protection, education, and socio-economic perspectives (Fraga et al., 2023). This research combines education, protection, aesthetics, function, tourism, safety, and enjoyment across disciplines to expand the complete understanding of tourism needs in dimensions and structural components. Second, we offer safety and enjoyment factors in developing sustainable tourism in karst cave geotourism. To the best of our knowledge, the use of safety and enjoyment variables was examined in the literature separately from other factors in previous studies. Third, the actual use of tourism impact factors is motivated by tourism management factors. Our motivation is based on the fact that some sites can suffer significant degradation in the absence of proper management. Heavy visitation, lack of management, poor maintenance, and especially the absence of appropriate education and monitoring are challenges in geotourism management (Fang et al., 2024; Marescotti et al., 2022; Yakupova et al., 2024). The design of appropriate geotourism management, making geosite features can be protected and preserved as well as opened as a geotourism resource for economic drivers so that sustainable tourism is realized (Fang et al., 2024; Yakupova et al., 2024). Fourth, our study focuses on geotourism in Gunungkidul, Indonesia, which differs from most studies focusing on cities in Siberia, China, India, Ukraine, Australia, and Spain. Indonesia certainly has a socio-political, cultural, and economic infrastructure

different from other countries. The existence of local wisdom that develops in Indonesian society influences tourism activities that differ from those of other countries. The potential of culture and local wisdom in tourism development is part of the product of human creativity that supports the achievement of sustainable tourism. The geosite being researched is a karst cave with characteristics different from previous research objects that focus on rocks, hills, mountains, and cliffs.

Finally, the results of this study offer valuable insights for tourism managers and the government to develop more effective planning and policies by understanding the factors that influence the achievement of sustainable tourism in karst cave geotourism. By the conceptual framework of the karst geotourism strategy, this research paves the way for further development of karst cave geotourism, especially Jomblang Cave. Furthermore, the results show the impact of geographical and cultural influences and the influence of safety and enjoyment factors on achieving sustainable tourism in karst cave geotourism, which adds to the generalizability of previous research. Research gaps are explored, and suggestions are provided for future research studies to advance sustainable tourism in karst cave geotourism, especially Jomblang cave, more effectively. The following sections organize the theoretical framework and hypothesis development, research methodology, results, discussion, and conclusion in the following order.

RESEARCH FRAMEWORK

Karst geotourism development strategy

A crucial aspect of karst geotourism is building sustainable local development, including geo-knowledge and geoethical values (Vasconcelos et al., 2023). The conceptual framework of the karst geotourism strategy includes educational, socio-economic, and protection perspectives (Roig et al., 2023). These karst areas must be based on strong support from the community involving authorities, educational institutions, and research through an integrative approach, making social participation according to guidelines at the government level. Given the benefits that local communities derive from tourism, tourism marketing and planning should be implemented within the concept of sustainability (Antić et al., 2020). Several models have been created to fulfil the conceptual framework of karst geotourism strategies by introducing factors that can influence the achievement of sustainable tourism. One popular model is the Modified Geosite Assessment Model (MGAM), which can measure and identify geotourism potential (Cvetanović et al., 2024). The M-GAM model consists of core values and added values. The principal value is mainly generated by the natural characteristics of the geosite, which consists of two groups of indicators. Geo-educational indicators fulfil scientific/educational Value (VSE), geoethical indicators fulfil scenic/aesthetic Value (VSA), and protection indicators fulfil protection value (VPr). Added Value is generated from tourists' modified use of the geosite. Added Value is divided into two groups of indicators: functional values as functional values (VFn) and touristic values as touristic values (VTr). The leading indicators of this model explain the conceptual framework of the karst geotourism strategy, including 4A factors. The assessment of the M-GAM model involves a team of experts and tourists. This involvement provides good results in evaluating geosite objects (Cvetanović et al., 2024; Juárez et al., 2024).

Safety

Safety is a state of security or tranquillity of a person or group of people against the risk of danger from environmental factors. Safety comes from the word safe, which means free from danger, calamity, or disaster, or it can also mean the absence of interference from any party. Differences in the character of tourism will differentiate the potential risks between one place and another, thus requiring tourism managers to be able to perform in-depth risk estimation. This estimation will calculate the degree of risk, divided into three levels: high, medium, and low. In UU Number 10 of 2009 concerning Tourism article 26 (D) (Ministry of Tourism of the Republic of Indonesia, 2009), tourism entrepreneurs or tour managers must consider the safety and security of tourists. Security and safety in the tourism sector differ from those in other fields. Tourism is an unusual environment where tourists travel for sightseeing, recreation, entertainment, exploration, or the search for knowledge (Bichler & Pikkemaat, 2021). Significant differences exist between this unique situation and other fields, mainly reflected in the sensitivity of tourism motivation and the comprehensiveness of tourism activities.

Enjoyment

Enjoyment is a positive affective state that occurs when a person engages in an experience or activity that satisfies a desire, goal or need, including but not limited to the need for pleasure, meaning, security, safety, sustenance, self-esteem, belonging, or love (Smith et al., 2014). Enjoyment is a high-level term encompassing many low-level experiences, psychological processes, and affective responses. Enjoyment can be studied at varying levels of abstractness (Goetz et al., 2006). At the most general (macro) level, enjoyment can be defined as a positive affective state that occurs when a person engages in an experience that satisfies a desire, goal, or need. At the most specific (micro) level, researchers can assess people's enjoyment of concrete tasks or activities (e.g., sports or exercise). Enjoyment is an immediate and temporary affective response to a positive experience at this micro level. People usually feel enjoyment when they engage in satisfying activities. These activities may meet basic needs, such as physiological needs, security, belongingness, self-esteem, self-realization, and meaningful life, as well as higher-order needs, such as curiosity and passion (Deci & Ryan, 2008).

Tourism management

According to the World Tourism Organization UNWTO (1999), present economies are characterized by considerable competitiveness in most sectors, including the tourism industry. Therefore, organizations in this sector should strive to achieve a competitive advantage. To this end, companies must perform good organizational organizational management (Tamang et al., 2023). Public awareness of sustainability and governance in tourism is increasing gradually (Yulian et al., 2023). Thus,

sustainable tourism management relies on extensive collaboration between companies, local communities, governments, and other stakeholders (Reinhart et al., 2023). In this case, implementing appropriate practices and policies is critical to achieving success in this type of tourism, preserving the environment, and increasing competitiveness (Reinhart et al., 2023). The karst cave geotourism development model in this study adapts M-GAM with the addition of safety and enjoyment factors to the added value and tourism management as factors that moderate the achievement of sustainable tourism.

HYPOTHESIS DEVELOPMENT

Education and sustainable tourism

A crucial aspect of karst geotourism is building sustainable local development, including geo-knowledge and geoethical values (Vasconcelos et al., 2023). The conceptual framework of the karst geotourism strategy includes educational, socio-economic, and protection perspectives (Roig et al., 2023). These karst areas must be based on strong support. Tourists who know about the cave environment, especially Jomblang cave, unintentionally engage in holiday behaviour that has negative consequences for achieving sustainable tourism. This phenomenon is based on social sociology theory, which postulates that attitude influences behaviour (Lyu et al., 2024). However, in the context of environmentally friendly behaviour, having a positive attitude cannot be a good predictor of running an environmentally friendly tour. Nowak et al. (2024) state that people involved in environmental protection at home must be made aware of the impact of tourism on the environment. Green tourism has a clear attitude-behaviour divide (Loi & Duong, 2022; Ren, 2024). Specific criticisms also arise from research investigating green behaviour. For example, Sorrell et al. (2020) reported that "green attitudes (towards the environment and sustainability in general) do not significantly influence tourist travel" experimentally showed that 94% of respondents believed that "picking up litter is everyone's responsibility." However, only 1.4% picked up litter when exposed to litter. Interviews with some travellers indicated that the litter did not belong to them, and they felt disgusted if they had to pick it up. Several studies have identified possible causes for this gap, including: using escapism and relaxation as an excuse to ignore environmental considerations (Filep & Laing, 2019), being too busy to change behaviour (Donkers, 2022), blaming others, according to (Agiropoulos et al., 2024; Donkers, 2022) having faith in technological solutions (Agiropoulos et al., 2024; Scott et al., 2019); rejecting responsibility (Scott et al., 2019).

H1: Education (Ed) Hurts Sustainable Tourism.

Effect of aesthetics on sustainable tourism

Natural resources are the basic factor for creating tourism products; whether or not the tourism sector develops depends largely on this factor. The larger the scale of tourism resources, the higher the quality, and the more likely it is to become an attractive tourist destination and expand and develop the tourism market (Mai et al., 2020). One of the natural resources for tourism is the aesthetic value of the landscape. The aesthetic value of tourism is a priority for tourists to visit tourist destinations (Zgłobicki et al., 2021). The aesthetic value of the natural wealth of a tourist destination needs special attention to be developed and protected to create sustainable tourism (Zhang & Tavitiyaman, 2022). Aesthetic values can influence tourists' perceptions of tourist destinations and sightseeing experiences (Nie et al., 2022). When negative aesthetic perceptions of the landscape have affected travellers, they will transfer those perceptions to other parts of the trip and the destination. Aesthetic values can also influence ethical and economic values. When tourists feel that parts of the landscape are ugly, these feelings will lead to discomfort and resentment towards the trip. Negative feelings will affect tourists' buying and consumption habits, weakening economic Value. The goal of sustainable tourism is not achieved.

H2: Aesthetic Value (As) positively affects tourism value.

Effect of protection value on sustainable tourism

The development of effective nature-based tourism can benefit both the environment and people. However, the fragile ecological environment and the prominent contradiction between local economic development and the protection of natural resources make sustainable development challenging. Tourism activities have environmental impacts, including increased waste and conflicts of interest in natural resource utilization utilization (Štrba et al., 2022). The tourist environment, such as natural beauty, tourism environment, and geosite aesthetics, must be protected to maintain sustainable tourism. Protection activities are to deepen stakeholders' understanding and recognition of natural resources, establish a system for preserving the aesthetic value of natural resources, build a sustainable development model with distinctive karst characteristics, and conduct pilot demonstrations (Zhang et al., 2023). De Araújo et al. (2024) suggests a positive relationship between environmental concern and the selection of environmentally friendly tourism. This positive relationship shows that the existence of a tourism protection activity affects the achievement of sustainable tourism. Therefore, the following hypothesis is proposed.

H3: Protection Value (Pr) Positively Affects Sustainable Tourism.

Effect of functional value on sustainable tourism

Rosselló et al. (2020) investigated the role of transportation infrastructure in attracting tourists. The impact is the importance of transportation infrastructure on the influx of tourism to a destination. Sugiama et al. (2024) state that accessibility significantly positively affects tourists' intentions to revisit. These conditions support sustainable tourism and arouse the appetite of tourists to return to travel (Ariesta et al., 2020; Sharkhuu et al., 2020) state that tourism and transportation development allow the achievement of sustainable tourism. The more accessible tourism is and has a tourist network, the more sustainable tourism is achieved. Sustainable tourism is a way to maintain high tourist satisfaction levels while reducing adverse environmental impacts. A tourist network supported by accessibility infrastructure makes it easy for tourists to move to tourist sites. Back et al., 2024 suggest that the availability of transportation for tourists is defined as the

feasibility of a destination providing quality transportation to facilitate the movement of tourists from one tourist attraction to another. Hu et al. (2019) state that accessibility significantly impacts tourist satisfaction with a place. Through the quality effect, tourist satisfaction indirectly affects the behaviour or intention to see again (Loi & Duong, 2022).

H4: Functional Value (Fc) positively affects Sustainable tourism. Perceptions research respondents agree that when tourist destinations are more accessible and have a tourist network, sustainable tourism is increasingly achieved.

Effect of tourism value on sustainable tourism

Tourism values include promotion, number of tourist arrivals, tourism services, and tourism facilities. Tourism facilities, human resources, and service quality are important factors in tourism development (Mai et al., 2020). Tourism infrastructure includes equipment and other facilities needed to welcome tourists and places as well as entertainment and recreation venues. In addition, the quality of tourism is greatly influenced by the use of qualified labour because workers who work in tourism not only carry out their tourism expertise but also carry out their duties. It is important to exchange cultures and communicate with visitors so that visitors feel comfortable and excited when travelling. Tourism service quality is also one of the important factors that help tourism develop sustainably. Service quality is a key factor in creating a reputation and tourism brand. From the tourist side, the quality and quantity of tourists can increase environmental awareness (Pop et al., 2024). Travellers' understanding of ecological awareness significantly impacts attitudes when doing tourism activities (Ibnou-Laaroussi et al., 2020). Tourists will be more concerned and responsible for protecting the environment.

H5: Tourism Value (Tr) positively affects Sustainable tourism. Research respondents perceive sustainable tourism is increasingly achieved when tourist destinations have complete tourist-supporting infrastructure and good promotion.

Effect of safety value on sustainable tourism

Each tourism industry has its characteristics and specialities that attract tourists. Safety is a critical factor that keeps tourists visiting tourism (Bowen & Sotomayor, 2022). Safety is part of the image of tourist destinations (Chauhan et al., 2019; Xie et al., 2022). The high level of safety of the sustainable tourism development strategy is one of its advantages (Pitakaso et al., 2024). Tourist safety is a global concern for sustainable tourism since uncertainty about safety can lead to notable variations in visitor flows. Guiding principles and methods that seek to minimize tourism's detrimental consequences on the environment, local communities, and cultural heritage while maximizing its beneficial effects. (Jayasinghe et al., 2024). Traveler safety is a priority in tourism around the world.

H6: Safety (Sf) has a positive effect on Sustainable Tourism. Research respondents' perceptions agree that when tourist destinations are considered safe from various disturbances, sustainable tourism is increasingly achieved.

Effect of enjoyable value on sustainable tourism

When discussing the influence of the value travellers feel during their trip on their intention to recommend, Fatmawati & Olga (2023) found a positive relationship between the two. Enjoyable is a positive emotion that travellers feel. Positive emotions provide a memorable travel experience. The key to profitability is the creation of high-quality experiences (Zhang et al., 2024) because creating meaningful travel experiences can be a key factor in tourism marketing and customer retention; more and more travellers are consciously seeking memorable and unique travel experiences (Marzo-Navarro et al., 2024; Stone & Sthapit, 2024; Terziyska, 2024) Customer satisfaction is an important antecedent of loyalty (Stone & Sthapit, 2024). Research suggests that emotions are an important outcome of travellers' consumption experiences, and travellers' positive emotions are associated with their satisfaction and loyalty (Eid et al., 2019; Hu et al., 2019; Kulakhmetova et al., 2022). Tourist loyalty to tourist attractions will improve the economy and affect the achievement of sustainable tourism.

H7: Enjoyable Value (En) positively affects Sustainable Tourism. Research respondents' perceptions agree that sustainable tourism is increasingly achieved when tourist destinations are considered enjoyable.

The effect of value management on the moderating relationship between education and sustainable tourism

Geotourism can be a powerful instrument for sustainable tourism development, but if managed effectively, it can directly threaten geosite resources. Heavy visitation, lack of management, poor maintenance, and especially the absence of proper education and monitoring challenges to geotourism management (Fang et al., 2024; Marescotti et al., 2022; Yakupova et al., 2024). Some sites can suffer significant degradation due to poor management. Geotourism management guidelines may vary depending on the tourist destination type and the tourism form realized. Sustainable tourism is achieved by creating appropriate geotourism management standards that allow geosite features to be safeguarded and maintained while simultaneously being available as a geotourism resource for economic drivers (Jayasinghe et al., 2024). Based on this research, improving tourism management can increase the influence of education on sustainable tourism.

H8: The interaction effect of Management and Education variables (Ed-Mn) on Sustainable Tourism is positive. Increased tourism management can increase the influence of Education on Sustainable Tourism.

The Effect of Value Management on the Moderating Relationship Between Aesthetics and Sustainable Tourism

Preserving aesthetic values from destruction is an important prerequisite for developing tourism activities. Natural beauty cannot be reproduced, and landscape resources are very fragile. If not strictly maintained, the natural beauty formed over the years will be destroyed, causing the landscape to lose its original charm and reduce its attractiveness to tourists (Marshall et al., 2019). Tourism management plays a positive role in the protection of aesthetic values, which is reflected in tourism revenue, providing financial security for the protection of aesthetic values and encouraging stakeholders to protect the aesthetic values of the area and the ecological environment (Zoderer et al., 2019). Local

villagers gradually realize the importance of maintaining the beauty of the natural environment because it is based on the benefits of tourism and ecological protection. Tourists are largely motivated by their impressions of the quality and value of historical attractions (Yin et al., 2024). When visitors have a pleasant aesthetic experience, they self-regulate their behaviour to protect a heritage site's natural beauty and ecological environment.

H9: The interaction effect of Management and Aesthetics variables (As-Mn) on Sustainable Tourism is positive. Improved tourism management can increase the influence of Aesthetics on Sustainable Tourism.

The effect of value management on the moderating relationship between protection and sustainable tourism

The theory of planned behaviour and norm belief postulates that societal values and beliefs are key drivers of pro-environmental behaviour. However, in the context of tourism, most of these theories fail to predict pro-environmental behaviour. People committed to the environment and have pro-environmental beliefs in their home context behave less environmentally friendly on vacation (Liberato et al., 2021). The extent to which people consider the environment in their actions is also less evident in tourism (MacInnes et al., 2022), with environmental appeals proving unsuccessful in changing tourist behaviour (Juvan & Dolnicar, 2014). MacInnes et al. (2022) states that the most practical interventions the tourism industry implements to make tourists behave more environmentally friendly must be revised. Habit is a strong driver of tourists' sustainable behaviour. Currently, dominant approaches, such as providing information about environmental impacts and requests to change behaviour to be environmentally friendly, are unlikely to seep into tourists' consciousness (Gardner, 2024).

H10: The interaction effect of Management and Protection variables (Pr-Mn) on Sustainable Tourism is negative. Increasing tourism management can reduce the influence of Protection on Sustainable Tourism.

The effect of value management on the moderating relationship between functional and sustainable tourism

Infrastructure is important for sustainable development, especially tourism (Mai et al., 2020). The development of the tourism sector is closely related and depends on infrastructure development, especially the available accessibility. The role of infrastructure is vital because the development of infrastructure and the available infrastructure system can encourage the development of the tourism sector. States that the relationship between infrastructure and tourism activities is an integrated system. Some infrastructure is very important for developing the tourism sector, namely transportation infrastructure such as roads, public transportation modes, and parking lots. Infrastructure plays a vital role in land use planning. Infrastructure is based on bringing interest to tourists and subsequently will be able to increase the number of tourist visits to a destination and realize Sustainable Tourism Development.

H11: The interaction effect of Management and Functional variables (Fs-Mn) on Sustainable Tourism is positive. Improving tourism management can increase the influence of Functional variables on Sustainable Tourism.

The effect of value management on the moderating relationship between tourism and sustainable tourism

Promotion is one of the aspects of tourism value that positively affects tourists' intention to return to visit, which can increase tourism development. However, tourism development has beneficial and negative impacts on tourist destinations: negative attitudes of residents, commercialization of culture, religion, and art, growth of social problems, environmental pollution, and landscape degradation. Promotional management can increase the flow of tourist arrivals. The uncontrolled flow of tourists makes it difficult to make objective estimates and prevent excessive anthropogenic pressure on tourism (Kuklina et al., 2021). The allocation of land for the development of tourist infrastructure has the potential to damage nature, not taking into account the uniqueness of mixed forests, with trees up to 400 years old, or the presence of rare plants listed in the "Red Book."

H12: The interaction effect of Management and Tourism variables (Tr-Mn) on Sustainable Tourism is negative, which means that increasing tourism management can reduce the impact of Tourism on Sustainable Tourism.

The effect of value management on the moderating relationship between safety and sustainable tourism

Kumar et al. (2020) state that the third element is the enabling environment, which is preferable to the standard operating conditions in a nation. The business environment (with 12 indicators), safety and security (with five indicators), health and hygiene (with six indicators), human resources and the labour market (with nine indicators), and information and communication technology readiness (with eight indicators) are its five pillars. Tourism research shows that travel exposes people to various risk levels and that destination choice is not only based on price and destination image but also on perceptions of safety. Even with the best efforts, a tourist destination cannot develop or survive unless it offers high safety. Destination image affects the level of loyalty both directly and through satisfaction. The theoretical implication is the importance of tourists' value preferences as a cornerstone of sustainable tourist destination development.

H13: The interaction effect of Management and Safety variables (Sf-Mn) on Sustainable Tourism is positive, which means that improving tourism management can increase the influence of Safety on Sustainable Tourism.

The effect of value management on the moderating relationship between enjoyable and sustainable tourism

Enjoyable is an image of a tourist destination that can develop sustainable tourism by increasing the number of tourist arrivals. Kanwal et al. (2020) show that managing enjoyable aspects of tourism determines the increase in tourists and the intention to visit again. The better the management of the delightful elements, the higher the tourist satisfaction and the intention to visit again. Emphasizes that satisfaction with the destination image is necessary to create sustainable tourism. Tourism management affects increasing the Value of enjoyment and ultimately increasing sustainable tourism.

H14: The interaction effect of Management and Enjoyment variables (Ej-Mn) on Sustainable Tourism is positive, which means that an increase in tourism management can increase the influence of Enjoyable on Sustainable Tourism.

Conceptual model

This study extends the MGAM theory, which consists of 8 constructs where educational value (Ed), aesthetic value (As), protection value (Pr) of geosite, functional Value (Fc), tourism value (Tr), safety value (Sf) and enjoyment value (Ej) act as independent variables. This model only considers sustainable tourism (St) as the dependent variable. The independent and dependent variables are further moderated by the tourism management variable (Mn). This model explores the improvement and reliability of the geotourism model to achieve sustainable tourism in Jomblang Karst cave geotourism. Figure 1 describes the conceptual framework and hypotheses developed among the mentioned constructs.

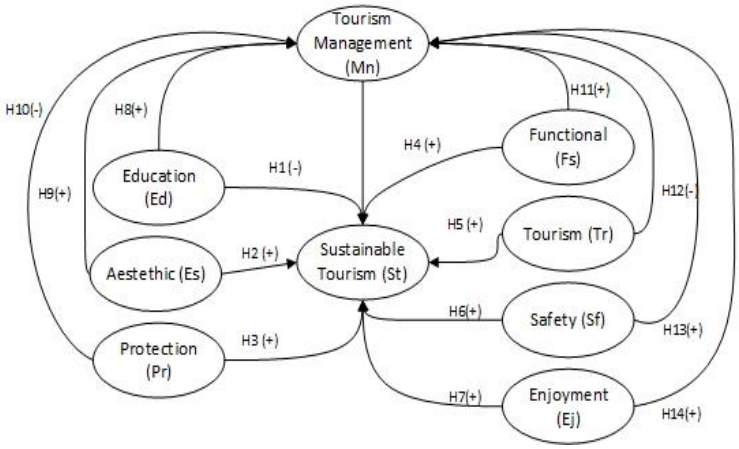


Figure 1. Proposed sustainable tourism model of karst geotourism (Source: Personal documentation of the researchers, 2024)

METHOD

The object of this research was conducted in Jomblang Cave. Jomblang Cave is located in the Gunung Kidul Regency, part of the Special Region of Yogyakarta, Indonesia. It is situated in the village of Jetis Wetan, Semanu District, approximately 50 kilometers southeast of Yogyakarta city. Jomblang Cave is a vertical cave with a depth of 80 meters, offering a unique adventure for visitors. At its base lies a lush underground forest, creating a striking contrast to the karst landscape above. Sunlight streaming through the cave's opening forms the stunning "light of heaven" phenomenon, making it a captivating attraction, as explained in Figure 2. The vertical cave is a cave that is 90º perpendicular from top to bottom. To enter the cave through a rope-assisted pulley technique.



Figure 2. (a) View from above Jomblang Cave (View of the forest and horizontal cave at the bottom of Jomblang Cave); (b) View from below Jomblang Cave (Vertical cave view from the bottom of Jomblang Cave); (c) Forest of Ancient Trees at the bottom of Jomblang Cave; and (d) View of the Bat Tunnel from inside the Horizontal Cave in Jomblang Cave (Source: Personal Documentation of the Researchers, 2024)

At the bottom of the cave is an ancient forest with thriving vegetation and a horizontal passage connecting Jomblang Cave and Grubug Cave. The horizontal cave passage is 260 meters long and can be walked. Inside the cave, there are ornaments, as in Figure 3. The cave ornaments are covered with geosite rocks, stalagmites, and stalactites, adding to the cave's beauty. At the end of the cave is an underground river with sunlight coming in from the cave opening above.

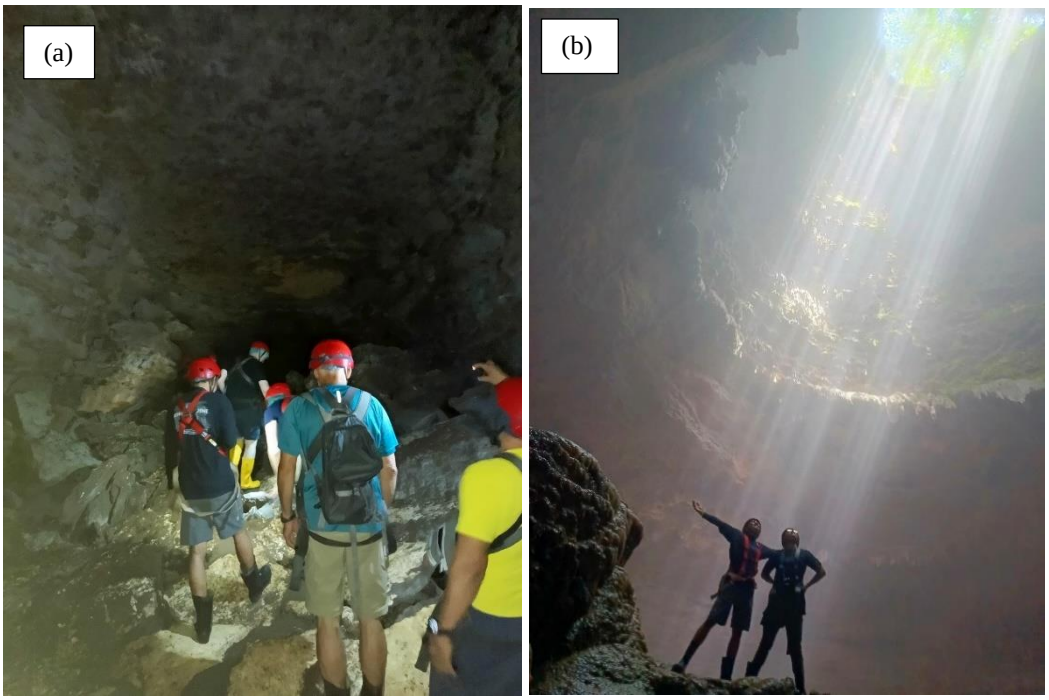


Figure 3. (a) View of cave walls and rocks inside the horizontal cave at Jomblang Cave; (b) View of sunlight entering from the cave hole "light of heaven" at the end of the horizontal cave of Jomblang cave (Source: Personal documentation of the researchers, 2024)

Item measurement

A quantitative approach is used to evaluate the influence of education variables (Ed), aesthetic value (As), site protection value (Pr), functional value (Fs), tourism value (Tr), safety value (Sf), and enjoyment value (Ej) on the achievement of sustainable tourism (St), and the influence of tourism management variables that moderate the relationship between independent variables and sustainable tourism. A total of 9 constructs and 56 items are used in the conceptual model, as described in Table 1.

Table 1. Measurement items for each construct and references (Source: Personal Documentation of the Researchers, 2024)

Construct	Indicator	Label	References	Construct	Indicator	Label	References
Education (Ed)	Uniqueness	Ed1	(Antić et al., 2020; Cvetanović et al., 2024)	Safety (Sf)	Risk	Sf1	(Pinthong et al., 2024; Toker & Emir, 2023; Zou & Yu, 2022)
	Representation	Ed2			Preparedness	Sf2	
	Publication	Ed3			Infrastructure maintenance	Sf3	
	Interpretation	Ed4			Conflict level	Sf4	
Aesthetics (Es)	Point of view	Es1	(Antić et al., 2020; Cvetanović et al., 2024)		Procedure	Sf6	
	Surface area	Es2			Clarity of instruction	Sf8	
	View Quality	Es3			Health infrastructure	Sf9	
	Geosite shape	Es4		Enjoyment (Ej)	Pleasure	Ej1	(Chen et al., 2020; Pei et al., 2020)
Protection (Pr)	Geosite state	Pr1	(Antić et al., 2020; Cvetanović et al., 2024)		Experience	Ej2	
	Protection level	Pr2			Relation	Ej3	
	Vulnerability	Pr3			Feelings flow	Ej4	
	Number of visitors	Pr4			Recommendation intention	Ej5	
Functional (Fs)	Accessibility	Fs1	(Cvetanović et al., 2024; Reinhart et al., 2023; Yulian et al., 2023)		Return intention	Ej6	
	Add nature tourism	Fs2			Calm	Ej7	
	Add culture tourism	Fs3		Sustainble Tourism (St)	Labor absorpstion	St1	(Bentley & O'Brien, 2024; Tena et al., 2021)
	Around city centre	Fs4			Income	St2	
	Around road network	Fs5			Tradition	St3	
	Public facilities	Fs6			Social	St4	
Tourism (Tr)	Promotion	Tr1	(Antić et al., 2020; Cvetanović et al., 2024)		Environmental sustainability	St5	
	OrganizedOrganized visits	Tr2			Hygiene	St6	
	Guides	Tr5		Management (Mn)	Satisfation	Mn1	
	Infrastructure	Tr6			Tools	Mn2	
	Annual visits	Tr7			Techniques	Mn3	
	Inn	Tr8			Service Amount	Mn4	
	Restaurant	Tr9			Environmental conditions	Mn5	

The measurement variables include Ed, Es, Pr, Fs, Tr, modified from (Cvetanović et al., 2024), Sf variable from (Zou & Yu, 2022), Ej variable from (Chen et al., 2020). The measurement items for each variable were modified and analyzedanalyzed according to the research objectives. Each measurement item of the latent variable was rated on a five-point Likert scale. The use of coarser scale points (with fewer scale points) will make it easier for respondents to read the complete scale list and answer specific problems compared to finer scales (which have many scale points) (Štrba et al., 2022; Zhang & Tavitiyaman, 2022). The scale ranges from one for strongly disagree to five for strongly agree.

Participant

Survey methodology is used to empirically investigate the relationship of the proposed model. Based on previously published works, the survey strategy is an appropriate method. That survey strategy is widespread in business and management research. It is usually used to collect large amounts of economic information from a sizable population (Viglia & Dolnicar, 2020). The second section contains demographics. The criteria for respondents selected were that the respondents had interacted with Jomblang cave at least once, the respondents were above 17 years old, and had done cave tours. Respondents included local government, tourism manager, speleological community, local people, and tourists. The sampling technique used in this research was snowball sampling. Respondents were selected based on their data in the questionnaire. The personal data confirmed the respondents' suitability for the requirements. If the respondents needed more qualifications, their responses were included in the study. This was done to ensure the broadest possible response and support the generalization of the research results. The questionnaire was written in Indonesian.

Instruments and data collection

The questionnaire was pre-tested several times to ensure that the format, wording, length, and sequence were appropriate based on expert opinion. During successive pre-tests, feedback was obtained from six experts: tourism researchers, karst researchers, policymakers, and speleology researchers. This helped refine the achievement of sustainable tourism through the proposed variables. A preliminary survey was conducted among 45 people to test the validity and reliability of the questionnaire. Concerning the 5% significance level (0.294; n=45), the correlation value obtained (r-calculated) was then compared with the product-moment correlation value (r-table). The reliability test is carried out to measure the consistency of the measurement instrument, using Cronbach's alpha formula with SPSS Statistics 25 software. An indicator is reliable if it has a Cronbach's alpha value of more than 0.6 (Hair et al., 2010). Based on the validation results, the outer loading of all items is above 0.4 and is acceptable.

Based on the reliability test results, each study variable is more than 0.6, which is considered reliable. This means that the variables used in this study have been entirely accurate and consistent, where if measurements are made on the same subject, the same results will be obtained (Hair et al., 2010), so the questionnaire is ready to use. The questionnaire was designed using Google Forms. The questionnaire was sent to respondents via email or WhatsApp obtained from the respondents. There needs to be more consensus regarding the recommended sample size for structural equation modelling (SEM). The critical sample size is 200. In addition, any number exceeding 200 is considered to provide appropriate statistical power for data analysis. A total of 372 respondents answered the electronic survey. After excluding unsuitable questionnaires, 310 questionnaires became the valid sample for analysis.

Data analysis

This study's analysis technique is Structural Equation Modeling with a Partial Least Square (SEM-PLS) algorithm approach. PLS's advantage is that it can predict behaviour in a situation where there are still limited theories explaining the context of sustainable tourism. The accumulated questionnaire data is processed using SmartPLS 3.2 software.

RESULTS

In this chapter, the results of data collection, validity and reliability tests, and SEM-PLS will be discussed, along with their explanations. The data collection results explain the characteristics of respondents, while the SEM-PLS analysis explains the evaluation of the measurement model and structural model. The analysis results are then associated with the theories and empirical research described in the literature review to test the hypothesis and formulation of research problems.

Result of describe

Table 2 is an overview of the characteristics of participating respondents. The respondent profile consists of gender, aThe profile includes occupation, visiting frequency, and domicile. Based on the demographic characteristics of the gender category, the questionnaire appraisers are dominated by men, 58%, while women are 42%. Demographic characteristics of the age category show that questionnaire appraisers are dominated by visitors aged 17-25 years as much as 40% compared to visitors aged 26-31 years, namely 28% and visitors aged> 31 years as much as 32%.

The demographic characteristics of the last education category show that the questionnaire appraisers are dominated by visitors with a previous education of S1 as much as 72% compared to visitors with a later education of SMA / SMK as much as 1%, Diploma as much as 7% and > S1 as much as 20%. The demographic characteristics of the job category show that the questionnaire appraisers are dominated by visitors with student jobs as much as 34%, compared to visitors with self-employed jobs, as much as 30%, private employees, as much as 15%, public employees with as much as 11% and others as much as 10%. The demographic characteristics of the visiting frequency category show that the questionnaire evaluators are dominated by visitors with a visiting frequency of 1 time as much as 85% compared to visitors with a visiting frequency of 2-3 times as much as 8%, and> 3 times as much as 7%.

Table 2. Profile of participating respondents (Source: Personal documentation of the researchers, 2024)

No	Category		Quantity	(%)
1	Gender	Male	179	58%
		Female	131	42%
2	Age	17-25	125	40%
		26-31	87	28%
		>31	98	32%
3	Latest education	High School	4	1%
		Associate Degree	21	7%
		Bachelor	222	72%
		>Bachelor	63	20%
4	Occupation	Student	104	34%
		Employee	47	15%
		Public Servant	33	11%
		Self-employed	94	30%
		Other	32	10%
5	Frequency of visits	1	265	85%
		2-3	24	8%
		>3	21	7%

Data analyst

Data analysis begins with confirmatory factor analysis (CFA) to build a structural model. Then, the validity and reliability of the measurement model (*outer model)* and the significance of the relationship between variables (*inner model*) are tested. Based on the conceptual framework that has been prepared, the structural model in this study is described in Figure 4 (SmartPLS Output, 2024). The structural model is created by designing the relationship between latent variables. The study's exogenous latent variables are educational attributes, aesthetics, protection, functional, tourism, *safety*, *enjoyment*, and management, which moderate the relationship between study variables. The study's endogenous variable is *sustainable tourism*.

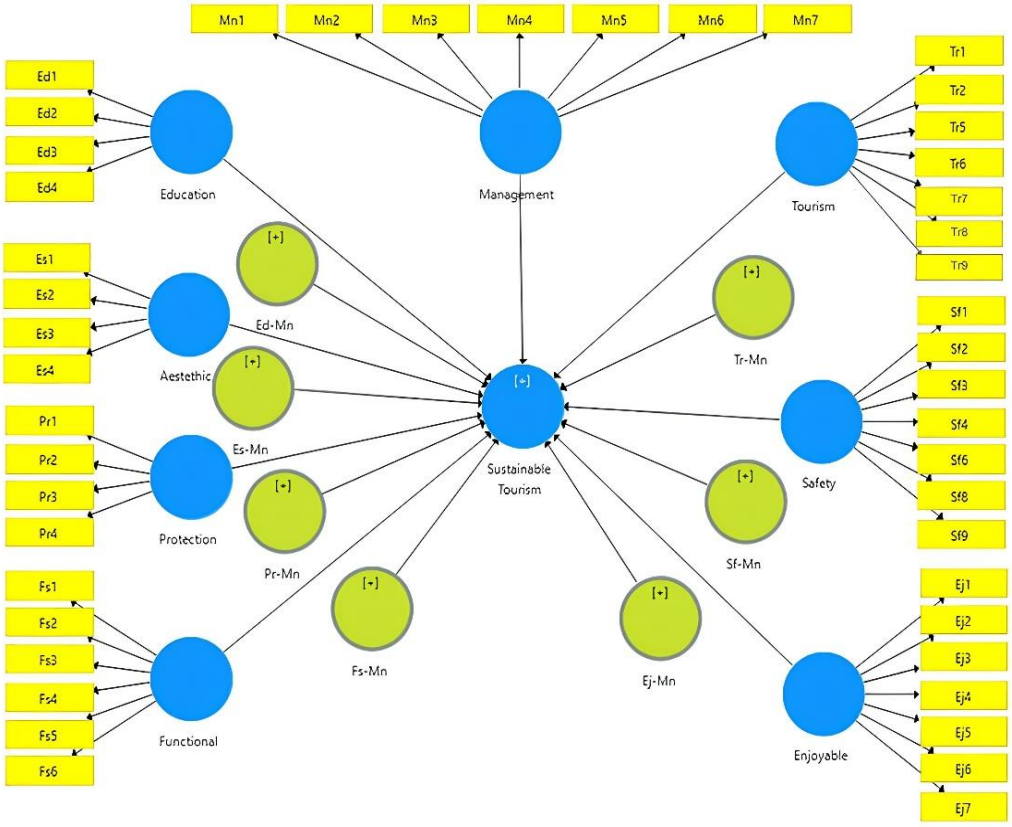


Figure 4. Proposed structural model (Source: Personal documentation of the researchers, 2024)

Evaluation of the measurement model (outer model)

The results of construct validity and reliability testing are described in the outer model stage in Figure 5. The convergent validity test is carried out by looking at each indicator's outer loading value on the latent variable. An outer loading value of >0.7 indicates that a variable has explained 50% or more of its indicator variance. However, the outer loading value of 0.5 to 0.6 can be sufficient for convergent validity requirements. Based on the evaluation results, the tourism value indicator (Tr7) has an outer loading value of less than 0.7. This Value means that the indicator does not meet the requirements of convergent validity. The model is modified by eliminating the Ws7 indicator to obtain the structural model, as shown in

Figure 3. Based on the evaluation results, it can be seen that all indicators have an outer loading value of more than 0.7. This indicates that each study variable can be explained by its indicators and meets the convergent validity requirements.

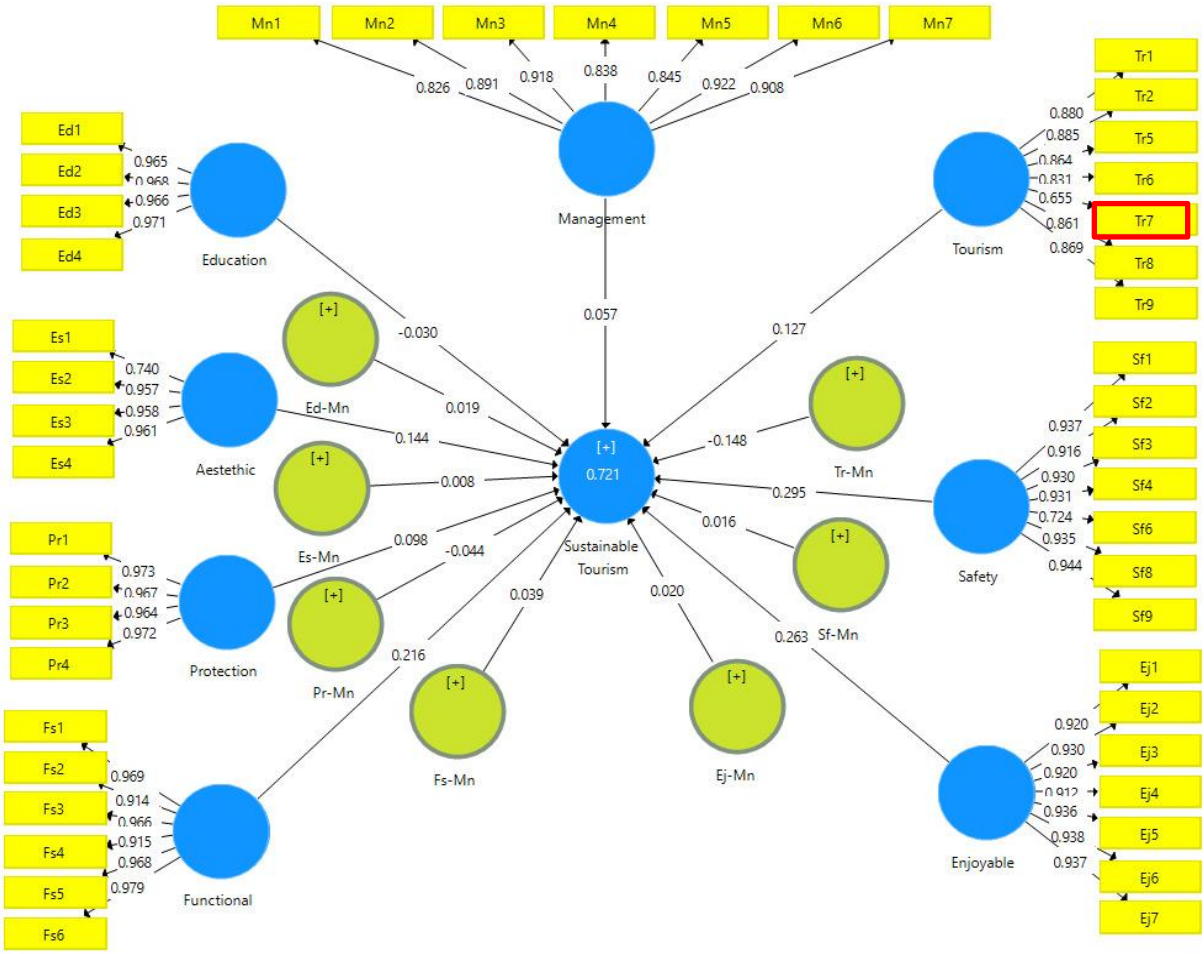


Figure 5. Measurement model evaluation results (Outer model) (Source: Personal Documentation of the Researchers, 2024)

Discriminant validity

The Fornell-Larcker Criterion (FLC) value and crossloadings are commonly used approaches in discriminant validity testing. The FLC value and cross-loadings of an indicator on its latent construct are expected to be greater than the cross-loadings on other latent constructs. The test results are described in Table 3. Table 3 shows that each indicator has the most considerable FLC value on its latent construct compared to the FLC values on other constructs. This explains that the indicators used in this study have good discriminant validity in forming their respective variables. Apart from the cross-loading Value, the results of the discriminant validity test can also be seen through the Average Variant Extracted (AVE) value. Each latent construct must have an AVE value> 0.5 to reflect a good measurement model. Based on Table 4, it is known that each indicator of the latent construct explains 50% or more of its variance (Sarstedt et al., 2017).

Table 3. Matriks Fornell-Larcker Criterion (FLC) (Source: Personal Documentation of the Researchers, 2024)

	Ej-Mn	Ej	As-Mn	As	Fs-Mn	Fs	Ed	Pr	Ed-Mn	Pr-Mn	Sf	Sf-Mn	St	Tr	Tr-Mn
Ej-Mn	1														
Ej	0.208	0.928													
As-Mn	0.377	0.357	1												
As	0.384	0.384	0.06	0.909											
Fs-Mn	0.364	0.355	0.585	0.225	1										
Fs	0.409	0.39	0.241	0.494	0.03	0.952									
Ed	0.313	0.425	0.235	0.255	0.253	0.308	0.967								
Pr	0.295	0.452	0.114	0.782	0.328	0.413	0.322	0.912							
Ed-Mn	0.349	0.316	0.351	0.255	0.352	0.294	0.121	0.286	1						
Pr-Mn	0.437	0.288	0.813	0.119	0.429	0.368	0.277	0.043	0.265	1					
Sf	0.494	0.366	0.246	0.508	0.201	0.619	0.412	0.416	0.238	0.374	0.905				
Sf-Mn	0.298	0.423	0.616	0.226	0.667	0.198	0.202	0.328	0.462	0.449	0.043	1			
St	0.341	0.657	0.28	0.592	0.279	0.631	0.404	0.586	0.294	0.286	0.648	0.283	0.898		
Tr	0.07	0.557	0.232	0.16	0.208	0.328	0.442	0.264	0.163	0.208	0.295	0.238	0.465	0.866	
Tr-Mn	0.439	0.069	0.103	0.243	0.191	0.234	0.157	0.208	0.337	0.168	0.271	0.198	0.097	0.231	1

Composite reliability

In SEM-PLS analysis, a construct is declared reliable if its composite reliability value is> 0.6 and is reinforced by a Cronbach's Alpha value> 0.7. Table 4 explains the composite reliability test results. The composite reliability value of 0.6 - 0.7 and Cronbach's alpha value of> 0.7 are considered good reliability. Based on the calculation results, all constructs have a composite reliability value and Cronbach's alpha> 0.7, so it is concluded that they are reliable.

Table 4. Model Validity and Reliability Test Results (Source: Personal Documentation of the Researchers, 2024)

Variable	Cronbach's Alpha	Composite Reliability	AVE
Ej-Mn	1	1	1
Enjoyable	0.973	0.977	0.861
As-Mn	1	1	1
Aesthetics	0.929	0.95	0.826
Fs-Mn	1	1	1
Functional	0.979	0.983	0.907
Education	0.977	0.983	0.936
Protection	0.933	0.952	0.832
Ed-Mn	1	1	1
Pr-Mn	1	1	1
Safety	0.962	0.969	0.82
Sf-Mn	1	1	1
Sustainable Tourism	0.952	0.962	0.807
Tourism	0.934	0.947	0.75
Tr-Mn	1	1	1

Structural model evaluation (Inner Model)

The structural model evaluation stage (inner model) tests the model's goodness (model fit) and hypothesis testing. The model goodness test is carried out by observing the R-square (R^2) value. Partial hypothesis testing is done by observing the significance value of the relationship between variables (direct and indirect effects). The R-Square (R^2) value is used to determine the predictive power of the structural model in SEM-PLS analysis. The criteria for the R-square Value that is close to or greater than 0.67 is considered strong, 0.33 is moderate, and 0.19 is considered weak (Hair et al., 2010). The R-square Value can be explained in Table 5.

Table 5. R-Square Value (Source: Personal Documentation of the Researchers, 2024)

Endogen Variable	R-Square	Criteria
Sustainable tourism	0,722	Strong

Based on the table, it can be seen that the R-square Value of the endogenous variable Sustainable Tourism is 0.722. This Value explains that the strength of these variables in predicting sustainable tourism is 72.2%. While the percentage of 28.8% is explained by other factors that are outside this research model, in addition to the R-Square Value, the Stone-Geisser Q-square value is also used to determine the goodness of the model; the higher the Q-Square value, the more the structural model fits the data (Tanwar et al., 2024). The Q-square test in this study can be seen in the following formulation:

$$Q^2 = 1\text{-}\ (1\text{-}R1^2)\ (\ 1\text{-}R2^2\ )\ (1\text{-}R3^2\ )\ldots\ 1\text{-}Rp^2$$

Explanation:

Q^2: The predictive ability of the model.

R^2: The coefficient of determination, which indicates the proportion of variance in the dependent variable explained by the independent variables. Interpretation:

$Q^2 > 0$: The model has good predictive ability.

$Q^2 \leq 0$: The model does not have predictive ability.

The sustainable tourism variable shows a R^2 value of 0.722. The Stone-Geisser Q Square value is calculated with the following equation;

$$Q^2 = 1\text{-}\ (1\text{-}0{,}722);\ Q^2 = 0{,}722$$

These results indicate that the model is considered strong and able to explain several variables that affect sustainable tourism with a contribution of 72.2%. Thus, this research model is declared to meet the requirements of goodness (model fit).

Hypothesis tests

Hypothesis tests are carried out by looking at the original sample estimates (O) value to determine the direction of the relationship between variables, as well as t-statistics (T) and p-values (P) to determine the significance level of the relationship. An original sample value close to +1 indicates a positive relationship, while a value close to -1 indicates a negative relationship (Sarstedt et al., 2017). A t-statistics value of more than 1.96 or a p-value more minor than the significance level (<0.05) indicates that the relationship between variables is significant. The results of hypothesis testing are described in Table 6. Table 6 shows that each variable has a significant relationship with sustainable tourism because each variable has a p-value < 0.05. In addition, the results show that the management variable is a moderating variable for

each relationship between each variable and sustainable tourism. This indicates that the management variable affects the strength or direction of the relationship between each other variable and sustainable tourism.

Table 6. Value of relationship between variables (direct and indirect effects) (Source: Personal documentation of the researchers, 2024)

	Hypothesis	O	T Statistics	P Values	Description
Ej-Mn -> Sustainable Tourism	H14	0.020	2.343	0.026*	Supported
Enjoyable -> Sustainable Tourism	H7	0.261	33.629	0.000*	Supported
As-Mn -> Sustainable Tourism	H9	0.015	1.687	0.102**	Supported
Aesthetics -> Sustainable Tourism	H2	0.131	22.248	0.000*	Supported
Fs-Mn -> Sustainable Tourism	H11	0.037	5.483	0.000*	Supported
Functional -> Sustainable Tourism	H4	0.218	43.290	0.000*	Supported
Education -> Sustainable Tourism	H1	-0.024	3.589	0.001*	Supported
Protection -> Sustainable Tourism	H3	0.105	19.430	0.000*	Supported
Ed-Mn -> Sustainable Tourism	H8	0.017	2.782	0.009*	Supported
Pr-Mn -> Sustainable Tourism	H10	-0.043	5.884	0.000*	Supported
Safety -> Sustainable Tourism	H6	0.295	53.322	0.000*	Supported
Sf-Mn -> Sustainable Tourism	H13	0.015	2.184	0.037*	Supported
Tourism -> Sustainable Tourism	H5	0.127	18.267	0.000*	Supported
Tr-Mn -> Sustainable Tourism	H12	-0.147	26.872	0.000*	Supported

* Significant at 0.05 , ** Significant at 0.10

The results showed that education negatively and significantly affects Sustainable Tourism. This shows that increasing education decreases its influence on sustainable tourism. The variables of aesthetics, protection, functionality, tourism, safety, enjoyment, and management significantly affect sustainable tourism. Increasing aesthetics, protection, functionality, tourism, safety, enjoyment, and management can increase its influence on sustainable tourism. The management variable moderates the relationship between each variable and sustainable tourism. Management variables hurt moderating the relationship between protection and tourism and sustainable tourism. This means that increasing management can reduce the influence of protection and tourism on sustainable tourism. Then, the management variable moderates each relationship between each variable and sustainable tourism. Management variables have a negative effect in moderating the relationship between protection and tourism and sustainable tourism. This means that increasing management can reduce the influence of protection and tourism on sustainable tourism. Then, the management variable positively moderates the relationship of Aesthetics, Safety, Enjoyable, and Protection to sustainable tourism. Increased management can influence the relationship between aesthetics, safety, enjoyment, and sustainable tourism protection.

DISCUSSION

This research tries to build a model to measure factors affecting sustainable tourism. The model is an adaptation of the M-GAM model, which in previous studies has been used to calculate the potential of geosites to achieve sustainable tourism. This study developed safety and enjoyable variables to complement the M-GAM variables. Several recommendations and considerations can be formulated. One of the study results is confirmation that safety and enjoyable management affect the achievement of sustainable tourism. This result is based on the theory that safety and enjoyable tourism are the image of a tourist destination that will increase tourist loyalty. Another study result is that the Value of education and the management of geosite protection hurt sustainable tourism. This is an important finding because it validates the multidimensional view of the Value of education and management of geosite protection more rigorously than previous studies.

The hypothesized relationships proposed in the structural model between latent variables were tested through the student T-test of association with the P value. As shown in Table 6, hypotheses and relationships between endogenous constructs are accepted. The results showed that the variables of aesthetics, protection, function, safety, tourism, and enjoyment can increase the achievement of sustainable tourism in Jomblang Cave. The education variable shows that tourists have a negative influence on the achievement of sustainable tourism. Tourists who know about the cave environment, especially Jomblang cave, are unintentionally involved in holiday behaviour that has negative consequences for achieving sustainable tourism. This phenomenon is based on social sociology theory, which postulates that attitudes influence behaviour. However, in the context of green behaviour, having a positive attitude is not a good predictor of practising green tourism. Green tourism has a clear attitude-behaviour gap.

The relationship between variables, when moderated by tourism management variables, the results obtained variables of education, aesthetics, function, safety, and enjoyment can increase the achievement of sustainable tourism. The more these variables are well managed, the more sustainable tourism is achieved. Meanwhile, the moderating influence of tourism management variables on the Protection and Tourism variables shows a negative impact on the achievement of sustainable tourism. This finding is based on research Viglia & Dolnicar (2020) which proves that environmental appeals have been unsuccessful in changing tourist behaviour (Viglia & Dolnicar, 2020). MacInnes et al. (2022) stated that most of the practical interventions the tourism industry implements to make tourists behave more environmentally friendly need to be revised. Habit is a strong driver of tourists' sustainable behaviour. Currently, dominant approaches, such as providing information on environmental impacts combined with requests to change behaviour to be environmentally friendly, are unlikely to sink into tourists' consciousness (Gardner, 2024). Uncontrolled promotional activities also affect the flow of

tourists. With an unchecked flow of tourists, it is difficult to make objective estimates and prevent excessive anthropogenic pressure on tourism (Kuklina et al., 2021). These results suggest that new ways of improving tourism management are needed. Habit-based interventions focus on the automaticity aspect of changing behaviour. The two main practical applications of habit-based interventions are stopping the automaticity of bad habits and strengthening the automaticity of good habits, which are proven effective methods for changing key habits (MacInnes et al., 2022). For example, multicompartment bins allow travellers to keep waste sorting automated.

Another example is reducing plate size to prevent tourists from taking too much food at the buffet. These ways can increase tourists' awareness of their behaviour while on the Jomblang cave tour. This study's findings will also enable academics and practitioners to take a broader view of the factors that influence the achievement of sustainable tourism. First, the applicability of the proposed theoretical model to the field of sustainable tourism has been confirmed. Second, the findings of this study will help scholars expand the literature and further develop theories in the field of sustainable tourism. Third, to the best of our knowledge, safety and enjoyment factors are examined in the literature separately from other factors in the tourism development model.

In contrast, this is the first integrated theoretical model that incorporates all the constructs that have been developed and empirically validated. Fourth, tourist safety and enjoyment should serve as the main tools to create a good image of Jomblang Cave, thus enhancing responsible management practices in the organization, creating a sense of accountability, and building trust (Kim & Chen, 2019). Fifth, with the insights gained from the theory of tourist behaviour, this study identifies the need for new ways to increase tourists' awareness to protect the environment of Jomblang Cave. Habit-based interventions focus on the automaticity aspect of changing behaviour. The two main practical applications of habit-based interventions are stopping the automaticity of bad habits and strengthening the automaticity of good habits, which are proven effective methods for changing key habits (MacInnes et al., 2022). For example, multicompartment bins allow travellers to keep waste sorting automated. Another example is reducing plate size to prevent tourists from taking too much food at the buffet. These methods can increase tourists' awareness of their behaviour while staying at Jomblang Cave.

This research has four valuable implications. First, the primary purpose of this research is to identify indicators and variables that influence sustainable tourism. This issue is important because by knowing the variables that influence sustainable tourism, the management of Jomblang cave tourism will be more effective. Secondly, the findings are helpful for all stakeholders in tourism management. They may face similar challenges while continuously looking for strategies to facilitate tourists. They can better evaluate their competitiveness based on the factors presented in this study. Third, the research opens new insights into the topic. This can increase tourist trust and improve the image of Jomblang Cave. Safety and enjoyment play an important role in the creation of sustainable tourism. Tourists will feel safe and have a pleasant experience while travelling in Jomblang Cave. The management of Jomblang Cave, with new interventions to increase tourist awareness and protect the environment, will create a preserved tourist environment. Thus, Jomblang cave tourism will gain the trust of tourists while still making sustainable tourism in the Jomblang cave environment.

CONCLUSION

Based on the results of the analysis, this research produces the following conclusions: This research was conducted through a field study by distributing questionnaires to 310 tourists who visited Jomblang cave. The results showed that the factors that influence the achievement of sustainable tourism are aesthetics, protection, functionality, safety, tourism, and enjoyment, which have a positive and significant effect on achieving sustainable tourism in Jomblang Cave. The education factor has a negative and significant influence on achieving sustainable tourism. When tourism management factors moderate the relationship of factors, the results of education, aesthetics, functional, safety, and enjoyable factors can increase the achievement of sustainable tourism. The more these factors are well managed, the more sustainable tourism is achieved.

Meanwhile, the moderating influence of tourism management factors on protection and tourism factors negatively influences the achievement of sustainable tourism. The proposed reflective model has a high predictive relevance concerning the endogenous factors of practical, sustainable tourism. Based on the results of this study, the management of Jomblang Cave should consider new ways to improve tourism management to achieve sustainable tourism. It is necessary to change tourist behaviour with habit-based interventions focusing on automaticity.

Habit-based interventions can stop the automaticity of bad habits and strengthen the automaticity of good habits. For example, providing multicompartment waste bins allows travellers to maintain the automaticity of waste sorting. These methods can increase tourists' awareness of their behaviour during the Jomblang cave tour. This research contributes the first integrated theoretical model that combines safety and enjoyment factors with other factors in the tourism development model and has been validated empirically. The results of this study will help scholars expand the literature and develop further theories in sustainable tourism.

Although this study has made significant contributions to the literature, there are still some potential limitations. The results are limited to tourists' perceptions. Generalizable results must be cross-validated with a larger sample size and various organizational/stakeholder settings. A larger sample size is needed to address the weak relationship between decision-making and public trust. This study is based on the results of a questionnaire survey. Further mixed methods will enrich the findings. The results of this study provide potential for future research development. First, because the topic of safety and enjoyment is relatively new, researchers can benefit from the findings of this study and apply them in their future observations. Second, future research exploring other similar tours will also benefit. Finally, this study outlines a path for future researchers to empirically investigate the impact of implementing safety and enjoyment factors and the form of implementation so that sustainable tourism is not disrupted.

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COMPONENTS OF MEMORABLE GASTRONOMIC EXPERIENCE AND THEIR EFFECTS ON VISITOR SATISFACTION

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Abstract: The significance of gastronomy in shaping tourism experiences has been extensively documented. Memories of gastronomic experiences are now considered to be of crucial importance in tourists' cognitive, affective and behavioral evaluations. The objective of this study is to identify the components that constitute memorable experiences in the context of gastronomic tourism and to ascertain the effect of each component on visitor satisfaction. To this end, a quantitative research study was conducted in Gaziantep, a well-known destination in Türkiye with a reputation for its culinary attractions. The data were collected from 244 domestic tourists using the convenience sampling method with face-to-face surveys adapted from the scale developed to measure memorable tourism experiences by Kim et al. (2012). The data were analyzed with exploratory factor analysis (EFA) to extract the factors, confirmatory factor analysis (CFA) and structural equation modelling (SEM) to validate the measurement model and to test the proposed relationships between each component of the memorable gastronomic experience (MGE) and visitor satisfaction. The EFA demonstrated that the model, comprising seven sub-components, accounted for 74.09% of the variance in memorable experiences, thus indicating a robust predictive capacity. The findings of the study indicated that hedonism, involvement, local culture and novelty components contributed the most to the memorability of gastronomic experiences, while meaningfulness and knowledge contributed relatively low. MGE as a total construct was found to be associated with visitor satisfaction. Six of the MGE components (hedonism, novelty, local culture, refreshment, involvement and knowledge) were found to have a significant direct effect on visitor satisfaction individually. However, one other component, meaningfulness, was not found to be significantly associated with satisfaction. By unveiling of the pivotal components of MGE, this study yielded substantial insights and implications for entrepreneurs and DMO's that seek to enhance visitors' satisfaction with gastronomy.

Keywords: gastronomy, memorable gastronomic experience, visitor satisfaction, Gaziantep

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INTRODUCTION

Experience is the concept that represents the essence and central afacet of the tourism industry (Kim & So, 2022). Tourism experience is a complex construct (Neuhofer et al., 2014) and includes all the experiences that tourists have at a destination, including behavioral, perceptional, cognitive and emotional expressions or implications (Oh et al., 2007). It is evident that a plethora of goods and services are provided within that complex construct. However, in the modern era, it can be argued that the provision of such goods and services alone is insufficient to satisfy customers, who are seeking experiences that will dazzle their senses, engage them personally, touch their hearts and stimulate their minds (Schmitt, 1999). As Pine & Gilmore (1999) asserted, consumers are now seeking distinctive experiences that accompany these goods and services, with the objective of creating memorable experiences. A memorable tourism experience has been defined as a tourism experience that is positively recalled and revived in memory after an event has occurred (Kim et al., 2012). This is regarded as the ultimate experience that tourists aim to obtain (Tung & Ritchie, 2011). Studies which are pertinent to this field of enquiry emphasize the significance of memorable experiences for both the demand and supply sides. The impact of memorable experiences on tourists' future travel decisions has been demonstrated by several studies (Kerstetter & Cho, 2004; Kim et al., 2010). Tourists tend to rely on past experiences and memories while making decisions for their future trips (Lehto et al., 2004; Wirtz et al., 2003). Tourists with positive memorable experiences are more likely to revisit the destination (Coudounaris & Sthapit, 2017). In recent times, there has been a shift in focus within the tourism industry, with practitioners now placing greater importance on the provision of memorable experiences for tourists, even more so than on the utilization of tangible resources (Wang et al., 2020). Memorable experiences represent a fundamental aspect of successful tourism products (Chen et al., 2020), serving not only as a primary driver of customer loyalty (Zhang et al., 2018) but also as a crucial factor influencing the competitiveness of a destination (Stone et al., 2018).

In light of the growing significance of memorable experiences, efforts to identify the essential elements that contribute to such experiences have intensified. Components of memorable tourism experiences have been researched by a growing number of studies (Kim & Ritchie, 2014; Lee, 2015; Chandralal et al., 2015; Chandralal & Valenzuela, 2015; Tsai, 2016;

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de Freitas Coelho et al., 2018; Sthapit & Jiménez-Barreto, 2018; Sthapit, 2019; Yu et al. 2019; Cao et al., 2019; Seyfi et al., 2020) following the first scholars (Kim et al., 2012) who developed memorable tourism experience scale. Research on memorable experiences and their components are typically considered within the broader field of tourism context. However, research focusing on the specific attributes that contribute to the memorability of experiences within particular tourism contexts, such as gastronomy tourism, remains relatively limited. Recently, gastronomy as one of the main components of tourism experiences has begun to garner significant attention in academic research. Remaining heavily reliant upon the conceptualization of Kim et al. (2012), some authors (e.g. Tsai, 2016; Adongo, 2015; Lee, 2015) studied on the components of memorable gastronomic experiences, and besides, some other authors (e.g. Sthapit, 2017; Stone et al., 2018; Williams et al., 2019; Tsaur & Lo, 2020; Rašan & Laškarin Ažić, 2023) sought to identify the attributes of memorable gastronomic experiences from different perspectives. Despite these studies, the extant literature is unclear regarding the components that contribute most to the memorability of the gastronomic experience, and the effect of each component on visitor satisfaction. This study aims to make a contribution to the growing body of knowledge in the field of gastronomy tourism research by investigating the components that contribute to the creation of memorable tourist experiences. By gaining an understanding of these components and their effects on visitor satisfaction, it would be possible for enterprises to offer novel experiences creating intrinsic values to be recalled by tourists at a later date.

LITERATURE REVIEW

Memorability and memorable tourism experience

In the context of tourism, from a dynamic perspective, memory plays a pivotal role in understanding an individual's recall of tourism experience of personal relevance (Kim et al., 2021). Memorability is an important aspect of tourism experiences (Pikkemaat & Schuckert, 2007). This is because memory is an integral part of the experience itself (Poulsson & Kale, 2004). Furthermore, memories of leisure experiences are likely to be rich, vivid and detailed (Tung & Ritchie, 2011). Memorable experiences have been described as special and spectacular (Tung & Ritchie, 2011), exciting (Ihamäki, 2012), embodying superlative quality (Bharwani & Jauhari, 2013), easier to recall and unforgettable (Wikström, 2008). Memorability is the tourists' evaluation of a travel experience as memorable, based on their ability to recall the travel activities they engaged in after the completion of the travel consumption (Oh et al., 2007). The formation and recall of memories, which extend throughout the tourism experience, directly affect the tourist's perception and impression of the destination, and further influence the tourist's intention to revisit (Marschall, 2012; Quan & Wang, 2004; Tung & Ritchie, 2011). The attributes of memorable experiences have been the subject of an increasing number of studies in tourism. Over the years, several studies (Kim & Ritchie, 2014; Lee, 2015; Chandralal et al., 2015; Chandralal & Valenzuela, 2015; Tsai, 2016; de Freitas Coelho et al., 2018; Sthapit & Jiménez-Barreto, 2018; Sthapit, 2019; Yu et al., 2019; Cao et al., 2019; Seyfi et al., 2020) have attempted to examine the dimensions of memorable tourism experiences or to test the framework originally developed by Kim et al. (2012) in other contexts. As noted above, Kim et al. (2012) were the first scholars to develop a scale that could measure memorable tourism experiences in a quantifiable way. The scale consists of seven dimensions: hedonism, novelty, local culture, refreshment, meaningfulness, involvement and knowledge.

Hedonism refers to experiences related to emotions such as enjoyment, excitement, and pleasure (Chandralal & Valenzuela, 2015). A substantial proportion of tourism activities can be classified as hedonic consumption. Tourists seek to experience pleasure during their stay in destinations and during the subsequent recall of the experience. In this sense, it can be stated that the hedonistic component, which is associated with positive emotions such as pleasure, enjoyment, excitement, and happiness, has a critical importance in memorable tourism experiences (Kim et al., 2012). Novelty refers to experiences different, unique, and authentic (Chandralal & Valenzuela, 2015) and it is considered as a crucial component of the tourism experience. As Cohen (1979) stated, tourists are inherently driven to seek out novel experiences. Tourists travel to a destination with the anticipation of an experience that is novel and distinct, recognizing that the opportunity for a similar experience in the future is limited. Local culture refers to tourists' interactions with local people and culture. The desire of tourists to gain a deeper understanding of the local people and their culture, and to engage in meaningful interactions with them, is regarded as a significant motivating factor in travel. Tourists who engage with local culture tend to evaluate their tourism experiences as more meaningful and memorable (Kim et al., 2012). The concept of refreshment is an important aspect of tourism, as it allows tourists to relax and recharge, providing a much-needed break from their daily lives and routines. It has been demonstrated that the experience of physical, social and psychological relaxation during tourism, as well as the positive emotions it engenders, contribute to the formation of memorable tourism experiences. Meaningfulness can be defined as the component related to the meaningfulness and importance of experiences for tourists (Chandralal & Valenzuela, 2015).

Tourism experiences can be conceptualized as an inner journey undertaken with the aim of self-actualization. During this journey, tourists seek meaningful experiences that provide cognitive, emotional, and/or psychological satisfaction (Kim & Ritchie, 2014). Involvement refers to interests and active participations of tourists in experiences (Kim et al., 2012). During tourism experiences, tourists' participation in activities aligned with their interests contributes to the memorability of their experiences. Knowledge encompasses the acquisition of geographical, historical, and cultural information about destinations and contributes to tourists' intellectual development and memorable experiences (Tung & Ritchie, 2011).

Gastronomic experience

Gastronomy is simply the art or science of cooking and eating well. It encompasses not only the practices of cooking, eating and drinking, but also any activity related to gastronomy, which has emerged as a pivotal component of tourism experiences. Gastronomy has thus been the focus of considerable attention and is now considered a field of research in its

own right (Johns & Kivela, 2001). Food-related studies have been conducted for more than three decades in the field tourism literature (Hsu et al., 2022). Since it is a tourist attraction, a part of local culture, a tourism product at destination and a tourist experience (Chen & Huang, 2016), there is a close relationship with gastronomy and tourism. Gastronomy attracts and motivates not only the tourists that have a particular interest in local food, but also the tourists that have more relaxed attitudes towards local foods (Henderson, 2014). Tourists may travel with primary or secondary motivations such as exploring a different cuisine, learning about the local cuisine, enjoying typical local dishes, relaxation, or cultural enrichment (Hjalager & Richards, 2002; Long, 2004). As Wang (2004) asserted, gastronomic experiences in tourism can be classified into two categories: (1) those that are a regular part of daily life and satisfying a basic physiological need, and (2) those that are unique and enhance the overall tourism experience, potentially even classifying as 'peak experiences'. The memorability of gastronomic experiences is a key factor in their potential to become part of a peak tourism experience. The significance of local gastronomy in the tourism sector is well-documented. Enterprises in many destinations integrate their gastronomic attributes into tourism products to promote culinary excellence (Neuman, 2017), attract more tourists (Eriksen, 2015; Mei et al., 2017), enhance destination loyalty (Folgado-Fernandez et al., 2017) and differentiate themselves (Chang et al., 2011).

The number of studies on the gastronomic experience is growing at a rapid pace, and those studies show that gastronomic experience is discussed from different perspectives. For instance, some studies have sought to ascertain the understanding the role and impact of food and beverage consumption in the tourism experience (Quan & Wang, 2004; Kivela & Crotts, 2006); defining characteristics that influence tourists' gastronomic experience (Chang et al., 2011); defining the attributes of gastronomic experiences (Williams et al., 2019) and the underlying components of such experiences (e.g., Berbel-Pineda et al., 2019; Jin et al., 2012; Björk & Kauppinen-Räisänen, 2016; Quan & Wang, 2004). Quan & Wang (2004) presented a conceptual model, and discussed the food and beverage consumption as a part of the peak experience and the supporting experience. In their study, Son & Xu (2013) evaluated gastronomic experience according to six criteria: its role as a source of novelty, its capacity to provide sensory pleasure, its status as a peak experience, its function as a symbol of authenticity, its role as a symbol of prestige, and its function for cultural discovery. Björk & Kauppinen-Räisänen (2014) identified three components of the gastronomic experience: the food experience, the space/environment experience, and the behavioral experience. They also indicated that the gastronomic experience in restaurants is influenced by the type of food served, its location within the restaurant, and the manner in which it is presented.

In recent tourism and gastronomy literature, authors have been discussing the concept of gastronomic experiences and their memorability. Some studies have focused on identifying the attributes and/or components that contribute to the memorability of gastronomic experiences. Tsai (2016), for instance, sought to identify the components of memorable gastronomic experiences and found that these components include hedonism, involvement, novelty, meaningfulness, refreshment, local culture and knowledge. Williams et al. (2019) conducted a qualitative study, revealing attributes of memorable gastronomic experiences, including relationships with the local community and other stakeholders, experiences with other trip participants, emotions as triggers, and uniqueness. Cao et al. (2019) identified attributes of memorable dining experiences from sensorial, behavioral, affective, intellectual, and social perspectives. Tsaur & Lo (2020) identified four components of memorable dining experience from the perspective of restaurant attributes: service behavior, exquisite and delicious cuisine, amazing physical environment and unique atmosphere, and high perceived value.

The majority of studies on gastronomic experiences have focused on cognitive components (e.g. Ribeiro & Prayag, 2019; Moreo et al., 2019; Sipe & Testa, 2018), while only a limited number have focused on affective components (e.g. Hsu et al., 2022). However, there have been attempts by certain authors to incorporate both cognitive and affective elements into their models (e.g. Akhshik et al., 2022; Horng & Hsu, 2021; Tsaur & Lo, 2020). These models have explored the concept of affective elements arising from cognitive memorable gastronomic experiences. Recently, Rašan & Laškarin Ažić, (2023) proposed a model of memorable gastronomic experience consisting of both cognitive (i.e. the physical environment, food quality, service quality and value for money) and affective (i.e. emotions) components.

METHODOLOGY

Study site and the measurements

Gaziantep, located southeast of the Anatolia Region in Türkiye, has been chosen as study site since the city has a rich culinary heritage and a reputation as a center of gastronomic excellence. Gaziantep with its culinary heritage and gastronomic attractions has been a member of Creative Cities Network of UNESCO since 2015.



Figure 1. Location of the study site – Gaziantep, the first city of gastronomy of Türkiye

Before the site study, we had an approval (on 30th November 2021 with protocol number 214582) from Anadolu University Ethics Commission. The data were collected from domestic gastro-tourists visiting Gaziantep via convenience sampling

technique using face-to-face surveys. The survey included a part that allows to get participants' descriptives and two scales to measure memorable gastronomic experience and visitors' satisfaction. Memorable gastronomic experience (MGE) scale was adapted from Kim et al.'s (2012) memorable tourism experience scale that has 24 items and seven independent components. Scale's validity and reliability in a cross-cultural context was verified by various scientific studies, some of which were in gastronomy tourism (Adongo et al., 2015; Tsai, 2016). A 3-item scale was used to measure visitors' satisfaction with gastronomy (SAT). MGE and SAT were measured with a 5-point likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Research model and hypotheses

The relationship between experience and satisfaction is commonly investigated in the marketing and tourism literature. In the vast majority of these studies, the experience is considered as a tourism experience, tourist experience or destination experience, associated with various features of destination or focused on experiences for a specific type of tourism. It is seen that some studies partially include attributes related to gastronomy in the measurement of tourist experience while limited studies measure only gastronomic attributes. Studies on the role and importance of gastronomy in tourism experiences (Quan & Wang, 2004; Kivela & Crotts, 2005, Kivela & Crotts, 2006; Beer, 2008; Kim et al., 2009; Björk & Kauppinen-Räisänen, 2016) show that local food and beverage consumption is an important component of tourism experiences and contributes significantly to the tourists' overall satisfaction level. In this study, all components presented in the proposed model (Fig.2) were measured using indicators related only to gastronomy and not to other attributes of the destinations. Following hypotheses are expected to make a new contribution to the literature, as they would allow a better understanding of the relationship between components of MGE and visitors' satisfaction level.

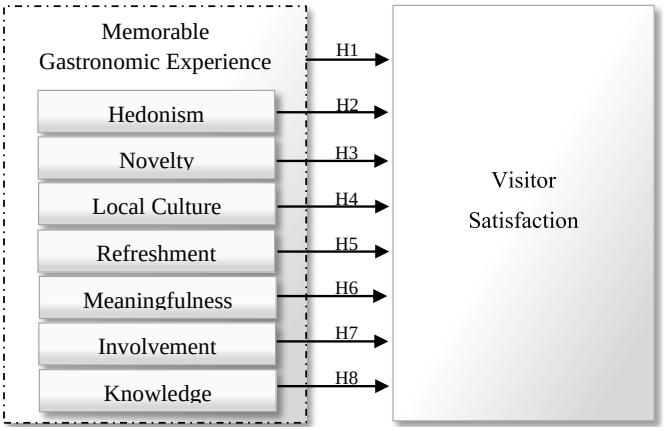


Figure 2. Proposed research model

H1. Memorable gastronomic experience is positively associated with visitor satisfaction.
H2. Hedonism is positively associated with visitor satisfaction.
H3. Novelty is positively associated with visitor satisfaction.
H4. Local culture is positively associated with visitor satisfaction.
H5. Refreshment is positively associated with visitor satisfaction.
H6. Meaningfulness is positively associated with visitor satisfaction.
H7. Involvement is positively associated with visitor satisfaction.
H8. Knowledge is positively associated with visitor satisfaction.

Data analysis

Pre-analysis was performed by using initial data set (257) to find out whether the data satisfy assumptions of structural equation modeling such as sample size, missing data, outliers, normality and multicollinearity (Kline, 2011; Reisinger & Mavondo, 2007). Those that have coding errors and missing values were deleted. Since the extreme values effect normality negatively, outliers that determined via Mahalanobis distance method ($p < .001$) were excluded from the data set. Skewness and kurtosis coefficients of observed variables were within acceptable ranges. That showed normality of data according to Tabachnick & Fidell (2013). The following analyzes were continued with 244 data, 95% of initial data. The data analysis was conducted in two phases. In the first phase, the SPSS 23.0 software was employed for descriptive and inferential analyses, as well as exploratory factor analyses, with the objective of determining the sub-components of the construct. In the second phase, AMOS software was utilized for confirmatory factor analyses, the construction of a structural equation model (SEM), the evaluation of model estimates, and the testing of hypotheses.

RESULTS AND DISCUSSION

Respondents' profile

A total of 244 respondents' descriptives are shown in Table 1. With a general evaluation, the profile of participants included more female than male (54.5%), age range were mostly 21-30 (38.5%) and 31-40 (26.6%), mostly they were married (63.9%) and graduated (57.0%). The responses shows that it was the first visit for 43% of participants, while the other visited the destination twice or more. 54.1% of participants made a short stay (1-3 days) in destination, and 31.1% of them stayed 4-7 days.

Table 1. Respondents' descriptives

Variable		N 244	%
Gender	Female	128	52.5
	Male	116	47.5
Age	20 and less	17	7.0
	21-30	94	38.5
	31-40	65	26.6
	41-50	38	15.6
	51-60	21	8.6
	61 and more	9	3.7
Marital status	Single	88	36.1
	Married	156	63.9
Educational level	Primary/secondary	18	7.4
	High school	65	26.6
	Grad uate	139	57.0
	Post graduate	22	9.0
Length of stay	1-3 days	132	54.1
	4-7 days	76	31.1
	8-14 days	26	10.7
	15 days and more	10	4.1
Number of visits	Once (first visit)	105	43.0
	Twice	65	26.6
	Three times	60	24.6
	Four times or more	14	5.7

Table 2. Exploratory factor analysis outcomes

Factors and Items	Loadings	Eigen Value*	% VE*	α**
Hedonism		8.109	13.160	.848
x1. Thrilled about having a new gastronomic experience	.730			
x2. Indulged in activities during gastronomic experience	.729			
x3. Really enjoyed this gastronomic experience	.765			
x4. Exciting experience	.814			
Refreshment		2.395	12.080	.867
x12. Liberating experience	.868			
x13. Enjoyed sense of freedom	.847			
x14. Refreshing experience	.674			
x15. Revitalized through this gastronomic experience	.658			
Meaningfulness		1.661	11.146	.858
x16. I did something meaningful during the experience	.811			
x17. I did something important during the experience	.886			
x18. Learned about myself during the experience	.826			
Knowledge		1.551	9.948	.840
x22. Exploratory gastronomic experience	.685			
x23. Had new knowledge	.817			
x24. Experienced a new culture	.835			
Novelty		1.240	9.822	.824
x5. Once-in-a-lifetime gastronomic experience	.804			
x6. Unique gastronomic experience	.723			
x7. Different from previous gastronomic experiences	.792			
Local Culture		1.084	9.466	.790
x9. Good impressions about the local people	.640			
x10. Closely experienced local culture	.804			
x11. Local people at destination were friendly	.814			
Involvement		1.001	8.472	.705
x19. Experienced the food/drinks I really wanted to try	.683			
x20. Enjoyed doing the activities I really wanted to do	.803			
x21. Interested in gastronomic events	.597			
Total variance explained: 74.09 %				
*Rotation sums of squared loadings (eigen value, % of variance explained)				
**Cronbach's alpha				

Exploratory factor analysis

The exploratory factor analysis (EFA) was performed to see the structural components of MGE scale and validity. Keiser-Meyer-Olkin values (.877), Bartlett's test of Sphericity (x^2 276=3334.855 p= .000), and inter-item correlations showed that sampling was adequate for analyses. To get a better factor pattern, Principal Component analysis extraction with varimax rotation method was used. The analysis revealed that all factor loadings of observed variables are above .500

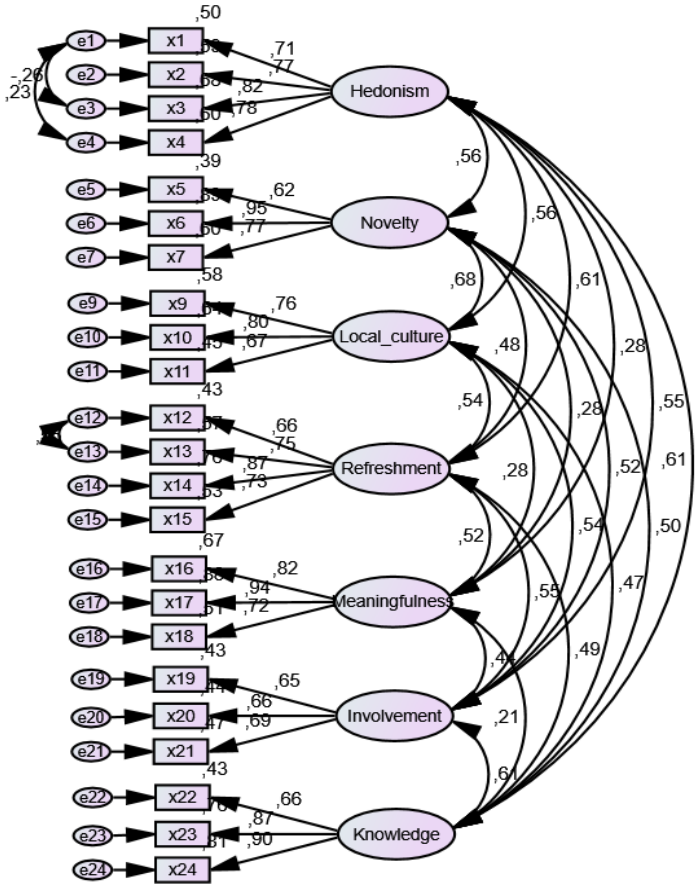
except one variable (x8) has cross-loadings on two factors. Excluding that item, the analysis was repeated and obtained a well interpretable factor structure. As shown in Table 2, seven factors/components (with an eigen value greater than 1) explained 74.09% of total variance. The factors of memorable gastronomic experience are hedonism, refreshment, meaningfulness, knowledge, novelty, local culture, involvement respectively.

As shown on the Table 2, Hedonism, explains 13.16% of the variance with an eigenvalue of 8.190. The Cronbach's alpha coefficient is .848, so the reliability is very good. Refreshment explains 12.08% of the variance with an eigenvalue of 2.395. The Cronbach's alpha coefficient of the factor was calculated to be 0.867, indicating a very good consistency. Meaningfulness, contributes 11.15% of the total variance explained with an eigenvalue of 1.661. The reliability of the factor is very good with a CA coefficient of 0.858. Knowledge has an eigenvalue of 1.551 and explains 9.948% of the variance. The factor was found to be reliable as the CA coefficient is .840. Novelty, which explains 9.82% of the variance with an eigenvalue of 1.240. The Cronbach's alpha coefficient of the factor was calculated to be .824, indicating good consistency. Local culture, with an eigenvalue of 1.084, explains 9.47% of the variance. Cronbach's alpha coefficient is .790. The last factor, Involvement explains 8.47% of total variance with an eigen value of 1.00. Cronbach's alpha is .705.

Confirmatory factor analysis

Memorable gastronomy experience measurement model was examined via first and second-order CFA by using maximum likelihood estimation method. Following the model fit assessments, analyses were conducted regarding the reliability and validity. To assess the measurement model's fitness to the empirical data, the chi-squared test (CMIN), the ratio of chi-squared to degrees of freedom ($\chi 2$/df), the comparative fit index (CFI), the root means square error of approximation (RMSEA), and the standardized root mean square residual (SRMR) indicators were used. Hu & Bentler (1999) strongly advise the use of one of the RMSEA, CFI with SRMR. Kline (2011) recommends the use of the $\chi 2$ test, RMSEA, CFI and SRMR indicators in the assessment of model fit.

With a few modifications as shown on the path diagram (Figure 3), we obtained a model that performed a good fitness to data as CMIN (chi-square value) was 384.234; DF (degree of freedom) was 206; CMIN/DF was 1.865 (< 3); CFI was .940 (≥ .90); RMSEA was .060 (< .08) and SRMR was .049 (< .08). To evaluate the model, estimates of the relationship between 23 observed variables and 7 latent variables, standardized factor loadings, significance levels, average variance and error variances were investigated. Composite reliability, convergent validity and discriminant validity were tested.



CMIN=384,234; DF=206; CMIN/DF=1,865; p=,000; RMSEA=,060; CFI=,940; GFI=,882

Figure 3. First-order confirmatory factor analysis path diagram

Table 3 illustrates the standardized factor loading ranges exceeding the acceptable threshold (>0.500), the average variance extracted (AVE), Cronbach's alpha coefficients and composite reliability (CR) coefficients for all seven latent variables.

Table 3. Indicators of measurement model

Latent variables	N. of observed variables	Standardized loadings range	Σ of std. loadings	A	AVE	CR
Hedonism	4	.705 – .825	3.072	.848	.591	.852
Novelty	3	.621 – .946	2.341	.824	.626	.830
Local Culture	3	.670 – .803	2.234	.790	.557	.790
Refreshment	4	.655 – .871	3.009	.867	.572	.841
Meaningfulness	3	.717 – .939	2.474	.858	.688	.867
Involvement	3	.654 – .686	2.004	.705	.446	.707
Knowledge	3	.656 – .900	2.425	.840	.665	.854

Each latent variable was indicated by a minimum of three observed variables and exhibited an acceptable level of AVE between 0.446 and 0.688. The composite reliability coefficients were calculated to be between 0.707 and 0.867. As the factor loadings, AVE, and CR coefficients met the requisite conditions, convergent validity was established.

Table 4. Factor Intercorrelations and discriminant validity

	F1	F2	F3	F4	F5	F6	F7
F1_Hedonism	**.769***						
F2_Novelty	.555	**.791***					
F3_Local culture	.556	.681	**.746***				
F4_Refreshment	.511	.475	.539	**.756***			
F5_Meaningfulness	.277	.283	.281	.524	**.830***		
F6_Involvement	.554	.522	.538	.548	.441	**.668***	
F7_Knowledge	.607	.503	.466	.486	.206	.606	**.815***
Note:Correlations are significant at 0.01 level (2-tailed); * Square root of average variance extracted							

To assess discriminant validity, the factor correlations were compared with the square roots of AVE (Table 4). As the square roots of the AVEs were found to be greater than the relevant factor correlations, measurement model were deemed to meet the conditions of discriminant validity. Next, we performed CFA one again to see and evaluate the relationship between first and second order latent variables as the path diagram shown in Figure 4. Model fitness indicators showed a well fit (CMIN 438.794, DF 220, CMIN/DF 1.995, CFI .926, RMSEA .064, SRMR .065). All relations between MGE and sub-components were found significant at a .001 level.

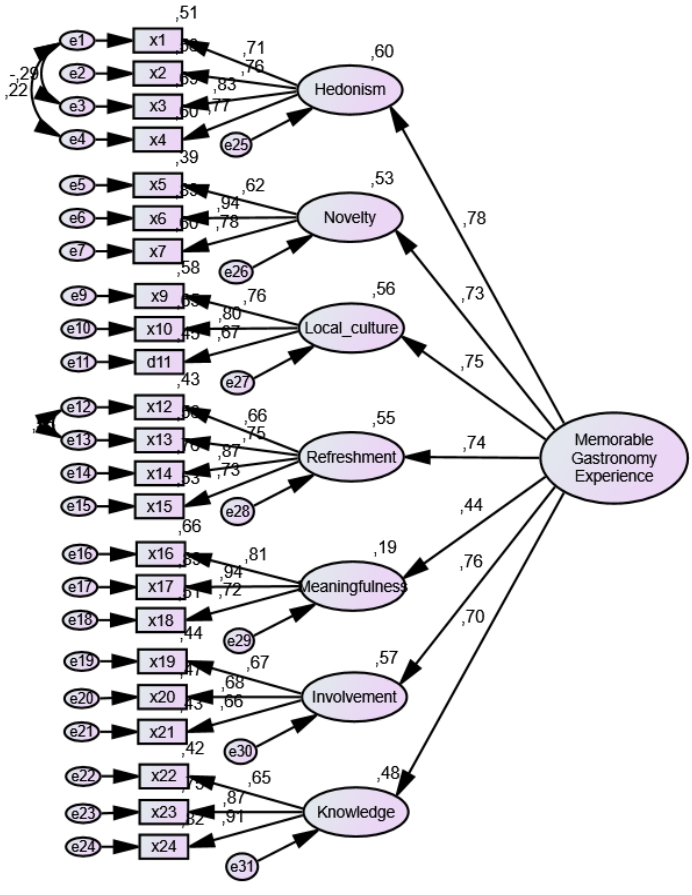


Figure 4. Second-order confirmatory factor analysis path diagram

All R values (correlation coefficients) are significant at the .001 level and verify how well the model explains observed data. Calculated R^2 values (coefficient of determination) indicate the proportion of variance in the dependent variable (MGE) that can be explained by the seven independent variables. An R^2 of .602 has been found for hedonism and that means 60.2% of the variability in the memorable gastronomic experience can be explained by the hedonism. As the pleasure derived from the consumption of local food and beverages increases, it is observed that the perception of memorable gastronomic experiences is enhanced. Involvement, the component that refers to interests and active participations of tourists in experiences, explains 57.1% of variance. Another significant component was identified as local culture with an R^2 value of 0.561, which also has a considerable impact on the variance change in the MGE. In light of the findings that demonstrate a robust correlation between gastronomy and local culture, it can be posited that the consumption of food and beverages that serve as emblems of cultural identity (Cusack, 2000; Horng et al., 2012) facilitates the process of learning about cultures. There are growing interest among tourists in experiences that facilitate the discovery of local cultures (Roozbeh et al., 2013), so it is unsurprising that the local culture dimension emerges as a prominent feature that contributes to the memorable nature of gastronomic experiences. Another component of the MGE is refreshment, which accounts for 54.8% of the variance (R^2=.548).

Refreshment is associated with the feelings of freedom, relaxation and renewal that tourists experience during gastronomic experiences, allowing them to temporarily escape their daily routines. These positive feelings contribute to the formation of memorable gastronomic experiences. Novelty with a determination coefficient of .533 explains 53.3% of the variance change in the memorable gastronomy experience. Tourists are individuals who are innately driven to seek out novel experiences (Cohen, 1979) and they tend to prefer experiences that are distinct, novel, and unique, rather than an ordinary travel experience. The other component, knowledge, explains the variance change in memorable gastronomy experiences by 48.5% (R^2=.485). The terms 'knowledge' is used here to refer to the acquisition of new cultural insights by tourists through the exploration of local gastronomy and the acquisition of novel information during their gastronomic experiences. It can be proposed that the novel information acquired during travel contributes to the intellectual growth of tourists and their memorable experiences (Tung & Ritchie, 2011). The final component of MGE, meaningfulness, exhibits the lowest determination coefficient (.194) and accounts for 19.4% of the variance in gastronomic experience. The dimension of meaningfulness pertains to the degree to which tourists perceive the relevant experiences as meaningful and important.

Estimation of measurement model

Structural models, those illustrated in the Figures 5 and 6, were analyzed with bootstrapping procedure (5000 resampling) to obtain path coefficients, standard errors, and t-statistics for path coefficients.

The research hypotheses were tested then. The test results reveal that seven of hypotheses were supported and one of them were rejected. Hypothesis regarding the effect of memorable gastronomic experience on visitors' satisfaction was found to be strongly supported (H1: β= .933, p< .001).

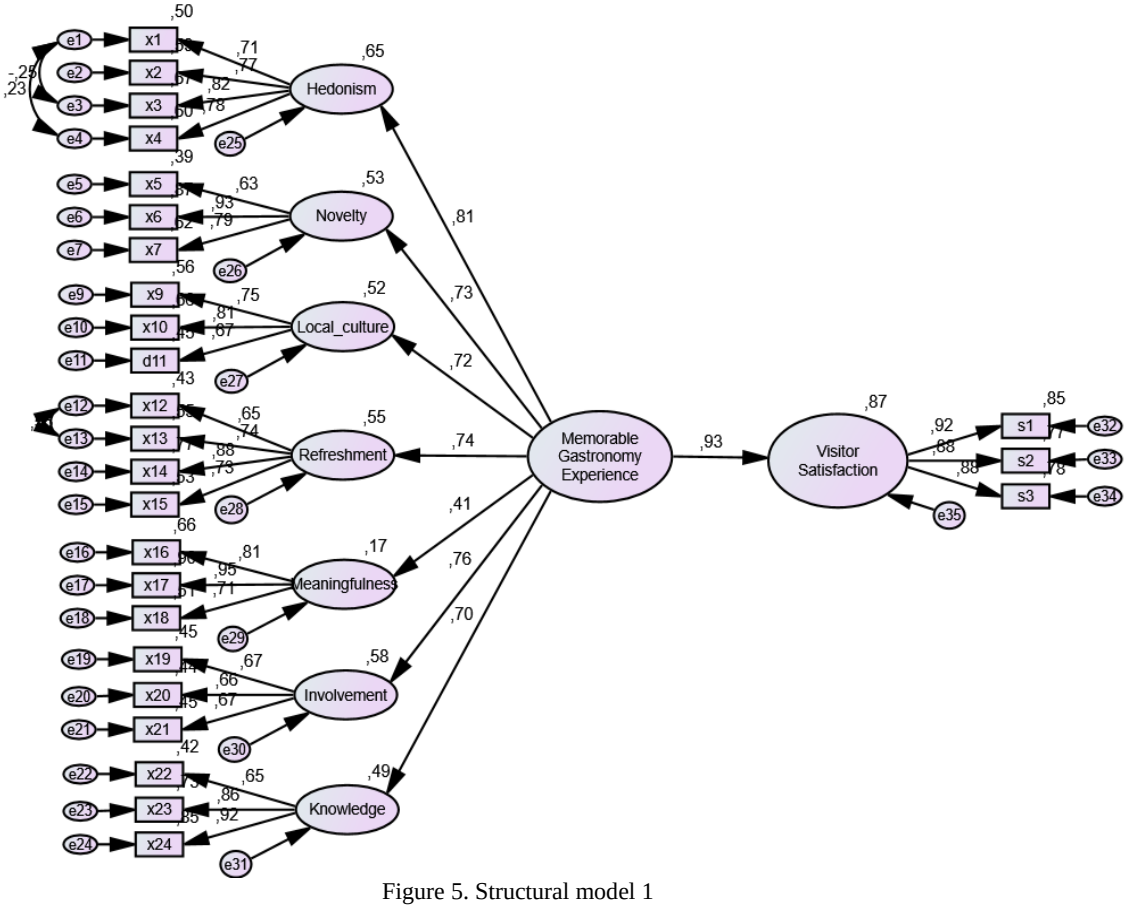


Figure 5. Structural model 1

Other seven hypotheses were related with the predictions of each MGE component's effect on visitor satisfaction. Since the direct effect coefficient (β = .459) was found significant (p< .001), hedonism had a direct and positive effect on visitor satisfaction. So, that hypothesis (H: 2) was supported. Hypothesis H3, which predicts a direct and positive relationship between novelty and satisfaction intentions, was supported (β = .302 p< .001). Local culture's effect (β = .173) on visitor satisfaction was found significant (p< .005), so the hypothesis H4 was empirically supported.

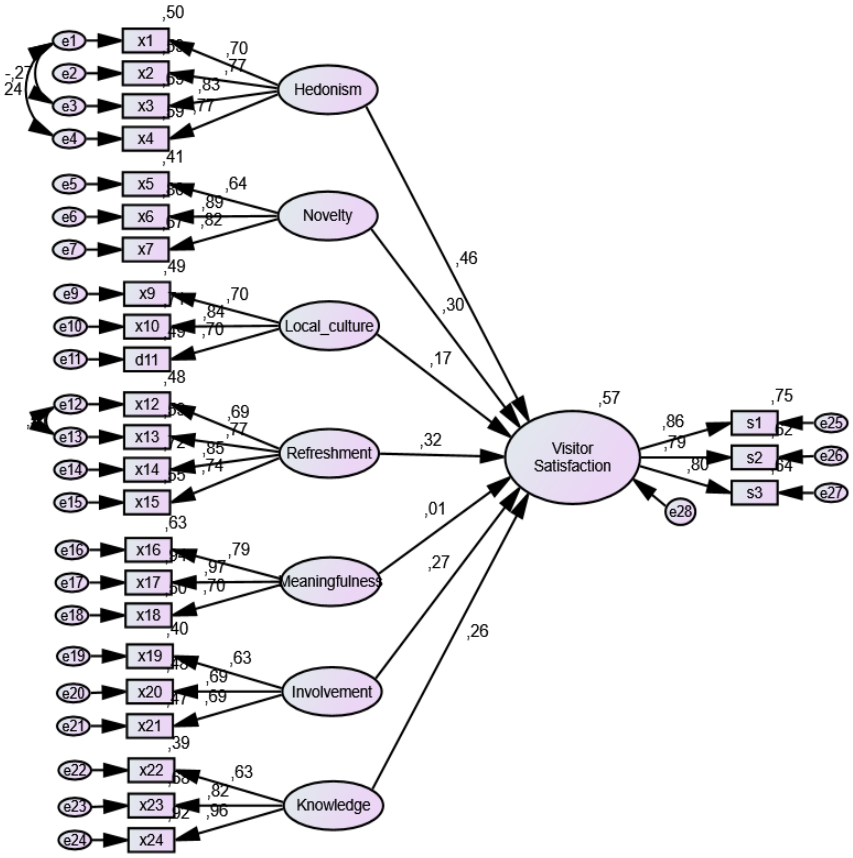


Figure 6. Structural model 2

Refreshment, as another component of memorable gastronomic experiences, effected visitors' satisfaction level since the hypothesis H5 was supported (β = .318 and p < .001). Hypothesis H6 predicted that meaningfulness had a positive effect on visitors' satisfaction with destination, however the test results shows that the hypothesis could not supported (β = .015 and p = .787). Involvement's effect on satisfaction was found positive and significant (β = .272 and p < .001), thus H7 was supported. The last component of memorable gastronomic experience, knowledge, also had a significant effect (β = .257 and p < .001) on visitors' satisfaction with destination. As predicts a positive relationship, hypothesis H8 was supported. The statistics of hypotheses tests were summarized on Table 5.

Table 5. Hypotheses test results

Hypothesized association	Std. estimate	Std. error	t-value	p-value	Status
H1: MGE → Visitor satisfaction	.933	.152	9.967	**< .001**	supported
H2: Hedonism → Visitor satisfaction	.459	.066	6.318	**< .001**	supported
H3: Novelty → Visitor satisfaction	.302	.055	4.800	**< .001**	supported
H4: Local culture → Visitor satisfaction	.173	.063	2.876	**.004**	supported
H5: Refreshment → Visitor satisfaction	.318	.053	5.001	**< .001**	supported
H6: Meaningfulness → Visitor satisfaction	.015	.041	.271	.787	not supported
H7: Involvement → Visitor satisfaction	.272	.074	3.922	**< .001**	supported
H8: Knowledge → Visitor satisfaction	.257	.061	4.317	**< .001**	supported

CONCLUSION, IMPLICATIONS, LIMITATIONS AND FUTURE RESEARCH

Conclusion

This study aimed to identify the components of memorable gastronomic experience, and to explore how each component effects visitors' satisfaction with destination. To answer the research questions, we conducted this research with a sample of 244 gastro-tourists in Gaziantep which is a well-known, attractive gastronomy destinations of Türkiye. We measured memorable gastronomic experience and its sub-components with an instrument tool that we adapted from Kim et. al's (2012) memorable tourism experience (MTE) scale. The results revealed that memorable gastronomic experience has seven components, each of which has contributions to the memorability of gastronomic experiences at different levels. The

components with the proportion of variance in memorable gastronomic experience were respectively hedonism (60.2%), involvement (57.1%), local culture (56.1%), refreshment (54.8%), novelty (53.3%), knowledge (48.5%) and meaningfulness (19.4%). Besides, we have aimed to find out the predicted effects of memorable gastronomic experience and each component individually on visitors' satisfaction level with destination. Hypotheses tests' results allowed us a better understand relevant relationships. The findings reveal a strong, positive relationship between memorable gastronomic experience and visitors' satisfaction. Regarding the effects of components, study findings showed that hedonism, novelty, local culture, refreshment, involvement and knowledge had a direct effect on satisfaction. However, there we could not find any significant evident that meaningfulness had an effect. We found the memorable tourism experience components of hedonism, refreshment and novelty were more likely to increase visitors' satisfaction level with destination.

Implications

Since the present study proves the components which make the gastronomic experiences particularly memorable, it gives some important insights to entrepreneurs. Practically, this study demonstrates that tourists will remember their gastronomic experiences based on the local food's hedonistic elements, the novel, unique and authentic nature of the gastronomic experiences, the interactions with local people and culture via local gastronomy, the experiences of physical, social and psychological relaxation, the active participation in experiences and the knowledge allowing them to be more informed. That means entrepreneurs need to design food experiences that appealing to tourists' hedonistic emotions. They need to novel and authentic food related creations that include cultural traits. They need to offer various gastronomic events and activities that which attract tourists and encourage their active participation. Such events enable tourists to perceive their experiences as memorable, and in this way, the satisfaction level of visitors can be increased.

Limitations and future research

This study has some limitations. Since the study only involved domestic tourists visited Gaziantep, future studies need to confirm this model by using a sample of international tourists. Another limitation is that we measured memorable gastronomic experiences with only positive evaluations. Further studies need to consider that visitors may encounter unpleasant experiences. The concept of memorability of gastronomic experiences are relatively new and need to be investigated in deep. With this study, we measured the memorable gastronomic experiences perceived by the gastro-tourists shortly after the relevant experiences. It has not been known yet whether the memorability of those experiences would last long. So, further studies are needed to explore this concept by using past experiences. Depending on their interest level to gastronomy, tourist may perceive the components of memorable gastronomic experience different. As Quan & Wang (2004) argues gastronomy and related activities may be just a part of daily routine for some of the tourist, while it means a peak experience for others. As demonstrated in previous studies (Hjalager, 2003; Kivela & Crotts, 2005; Björk & Kauppinen-Räisänen, 2016; Cordova-Buiza et al., 2024), different tourist groups can be identified depending on their interest in local gastronomy. So, we suggest scholars to research the concept by comparing those tourist groups.

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THE IMPACT OF TOURISM DEVELOPMENT ON POVERTY ALLEVIATION: EVIDENCE FROM THE LEBANESE MARKET

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Abstract: Tourism development has increasingly been recognized as a strategic mechanism for poverty alleviation in developing economies, given its capacity to generate employment, foster local entrepreneurship, and enhance household incomes. By stimulating economic activity across various sectors, tourism serves as a powerful driver of financial inclusion and community empowerment. This study examines the impact of tourism development on poverty reduction in Lebanon through a conceptual framework that positions tourism development as the independent variable, with cultural preservation, income growth, and employment generation acting as mediators, and poverty alleviation as the dependent variable. Using Structural Equation Modeling (SEM), the study evaluates the relationships among these variables to understand the extent to which tourism contributes to economic stability and improved living standards in Lebanon. Methodologically, this study employs SEM analysis to assess six proposed hypotheses, five of which were validated through empirical testing. Data collected from 202 respondents—including professionals and stakeholders in Lebanon's tourism sector—highlight the critical role of employment generation and income growth in reducing poverty. Findings reveal that while income growth and employment creation exhibit a strong and direct influence on poverty alleviation, cultural preservation has a relatively limited impact within this framework. The results underscore the notion that tourism development serves as a substantial contributor to economic progress by providing sustainable job opportunities, increasing disposable incomes, and stimulating local industries, thereby fostering economic resilience. The study's conclusions align with previous research, including Mitchell and Ashley (2010), which emphasizes the role of tourism in driving income redistribution and employment expansion, particularly in developing regions. By demonstrating the significance of tourism-led employment opportunities, this research affirms that tourism can be leveraged as a policy tool for sustainable development and poverty reduction. Moreover, the findings offer valuable implications for policymakers, tourism strategists, and economic planners, highlighting the need for targeted interventions that maximize tourism's socioeconomic impact. Beyond immediate economic benefits, this study suggests that tourism-based initiatives should be designed to ensure equitable distribution of financial gains, particularly in underserved and rural communities. Future research may explore sector-specific contributions,such as ecotourism and heritage tourism - to further refine the framework and enhance long-term strategies for poverty alleviation.

Keywords: tourism development, poverty alleviation, cultural preservation, income growth, employment generation, Structural Equation Modeling (SEM), Small and Medium Enterprises (SMEs) in tourism

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INTRODUCTION

Tourism is increasingly recognized as a powerful catalyst for economic development and poverty alleviation (Chok et al., 2007, Jiang et al., 2011), especially in developing countries with limited economic diversification. As a multifaceted sector, tourism drives economic growth by generating employment, supporting local businesses, and creating foreign exchange earnings, all of which can significantly enhance community livelihoods (Medina-Muñoz et al., 2006). Tourism's economic impact is particularly notable because it is labor-intensive, requiring direct employment across sectors such as hotels, restaurants, transportation, and other service industries, as well as indirect support for related industries like agriculture, retail, and handicrafts, which contribute to the broader tourism supply chain (Mitchell & Ashley, 2009).

These dynamics make tourism especially valuable for Lebanon, a country uniquely positioned with a rich cultural heritage, scenic landscapes, and a longstanding tradition of regional tourism. Known for its historical sites, including ancient Phoenician cities, Roman ruins, and medieval castles, Lebanon offers a tapestry of cultural attractions that appeal to both regional and international tourists. Its diverse geography, from the Mediterranean coastline to the snow-capped mountains, enables a variety of tourism experiences, including beach tourism, mountain and eco-tourism, and cultural heritage tours. Additionally, Lebanon's culinary tradition, festivals, and vibrant arts scene further enhance its

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attractiveness as a destination. Despite its small size, Lebanon has been a prominent tourism hub in the Middle East, attracting visitors from neighboring countries and beyond, particularly prior to recent economic and political challenges. However, the country's potential in the tourism sector remains largely untapped, constrained by political instability and economic crises that have significantly reduced tourist inflows and limited investment in tourism infrastructure.

The socio-economic landscape in Lebanon presents a complex set of challenges that underscore the importance of exploring alternative economic drivers, such as tourism. The country has faced escalating poverty rates, with recent estimates showing that around 60% of the population now lives below the poverty line, a sharp rise from previous years (Roberts & Naimy, 2023). Currency depreciation has further worsened economic conditions, with the Lebanese pound losing over 90% of its value since 2019, which has drastically impacted purchasing power and raised inflation to unprecedented levels (Naimy & Obegi, 2023). Unemployment is also a severe issue, with youth unemployment reaching approximately 47%, creating significant barriers to economic mobility and social stability. These conditions have strained the economy, widening economic inequality and limiting viable paths for sustainable growth (Naimy & Obegi, 2023). In this context, tourism represents one of the few remaining sectors with the potential to create inclusive economic opportunities and drive poverty alleviation by promoting local entrepreneurship and stimulating demand for goods and services produced by local communities. However, while the economic benefits of tourism are widely recognized, its effectiveness as a poverty alleviation tool remains complex and context-dependent, influenced by factors such as income distribution, resource accessibility, and local community engagement in tourism-related activities. Prior research reveals that tourism's ability to reduce poverty hinges on its influence on cultural preservation, income levels, and employment creation, particularly in rural and underserved regions (Mitchell & Ashley, 2009). Dritsakis (2004) demonstrated tourism's role as a long-term economic growth factor in Greece, while Song & Li (2008) emphasized tourism demand's contribution to sustained economic resilience in destination markets. These findings underscore tourism's potential to support sustainable development in Lebanon. Furthermore, enhancing cultural preservation not only attracts tourists but also cultivates a sense of pride among local communities, fostering heritage conservation and empowering local engagement (Ashley et al., 2000).

This paper makes a significant contribution by examining the specific pathways through which tourism can impact poverty alleviation in Lebanon, moving beyond broad assumptions that economic growth benefits all sectors equally. Unlike traditional models that rely on aggregate economic indicators, this study employs a targeted approach to assess how tourism affects poverty through specific mediating factors, including cultural preservation, income growth, and employment generation. This research posits that tourism development has a positive influence on these mediators, which subsequently contributes to poverty alleviation in measurable ways. To analyze these complex relationships, the study employs Structural Equation Modeling (SEM), a robust statistical method particularly well-suited for examining multiple, interrelated variables within a single framework. SEM is crucial in this study as it enables simultaneous testing of both direct and indirect relationships, capturing the nuanced ways in which tourism development influences poverty through mediating variables. By modeling tourism development as the independent variable and cultural preservation, income growth, and employment generation as mediators, SEM provides a detailed, integrated view of how these variables collectively impact poverty alleviation. The advantage of SEM lies in its ability to measure latent constructs, account for measurement error, and assess the strength and direction of causal paths within the model. This feature is significant for tourism research, as it allows for a more precise analysis of tourism's multi-dimensional effects on poverty. The model will be validated with survey data from 202 respondents working in Lebanese tourism organizations, selected through stratified random sampling to ensure representation across different sectors within the industry.

The originality of this study lies in its empirical focus on Lebanon, filling a critical gap in tourism research as no prior studies have specifically modeled the impact of tourism on poverty alleviation within Lebanon's complex economic environment. Unlike existing research that often addresses tourism's broader economic contributions, this study employs a comprehensive model to examine tourism's potential for poverty alleviation through specific mediators, providing original insights tailored to Lebanon's unique socio-economic context. By assessing tourism's role in poverty reduction through these mediating factors, this study aims to offer actionable suggestions that inform policy and strategy, ensuring tourism benefits are distributed equitably and sustainably across different segments of society.

The paper is structured as follows: Section 2 presents a literature review on tourism's role in economic development and poverty reduction; Section 3 details the methodology, including the model design, sample selection, and data collection methods; Section 4 analyzes the results, focusing on how tourism impacts cultural, economic, and employment factors linked to poverty alleviation; Section 5 explores the implications of these findings for tourism policy and sustainable development in Lebanon; and finally, concludes by the future research opportunities.

LITERATURE REVIEW

The ongoing discussion about poverty reduction strategies partly hinges on the extent to which tourism can help alleviate poverty in developing countries (Shah, 2023). Tourism has become a crucial economic activity for many developing nations (Chau, 2024), aiming to reduce poverty and enhance economic well-being (Clancy, 1999; Hawkins & Mann, 2007). The primary rationale for developing countries allocating resources to tourism lies in the adoption of the tourism-led growth (TLG) strategy (Richardson, 2021). According to the Tourism and Leisure Group (TLG), tourism has the potential to create employment opportunities and income, contribute to a favorable balance of payments, promote the growth of tourism-related enterprises, and ultimately stimulate overall economic activity (Simorangkir et al., 2024). A substantial body of empirical evidence indicates a strong positive correlation between the development of tourism and economic growth (Brau et al., 2005; Croes & Vanegas, 2008). According to Sinclair & Stabler (1997), the infusion of

tourist revenues into developing nations can significantly impact their economic conditions. Despite the extensive research on tourism, there remains a lack of understanding regarding its effects on impoverished populations in developing nations. This lack of understanding is concerning, especially considering that approximately 25% of the global population lives in poverty. International organizations such as the World Tourism Organization (WTO) recognize tourism as a crucial catalyst for addressing poverty. Many developing nations have incorporated tourism as a significant instrument in their poverty alleviation strategies (Le Thanh & Le Kien, 2020). Mitchell & Ashley (2010) note that a substantial proportion of poverty reduction documents in Africa, specifically 80%, reference the role of tourism. However, there is insufficient empirical evidence to substantiate this claim (Simorangkir et al., 2024). Despite these challenges, poverty remains a central topic of discussion within the development field. The international community identified the reduction of global poverty as a primary objective for 2015, as outlined in the First Millennium Development Goal (MDG).

The topic of tourism development and poverty reduction has received limited attention in tourism studies, primarily due to the prevailing influence of the trickle-down theory. Optimizing resource allocation for the most efficient use is seen as a major challenge for a nation and its market. Efficiency facilitates the attainment of social optimality and drives economic growth. According to this perspective, the benefits of economic growth will eventually reach the economically disadvantaged (Shah, 2023). Mak (2004) argued that it is essential to distinguish between efficiency and equity, noting that an intervention aimed at enhancing overall well-being may disproportionately benefit certain individuals. If those who gain from increased efficiency are already wealthy, then improving efficiency could align with rising inequality.

The continuous influx of new funds into the economy is crucial for the well-being and long-term viability of a country or community. This financial support is necessary to compensate for money spent outside the community by residents and businesses, counteract the effects of inflation, and meet the needs and rising expectations of a growing population (Lewis & Chambers, 2007). Currently, tourism represents a significant avenue for injecting fresh capital into the economy, acting as a catalyst for economic growth. According to Kotler et al. (1999), the provision of funds not only stimulates economic growth but also upholds the principles and way of life of a nation's inhabitants and entrepreneurs.

The importance of this cannot be overstated, as Nigeria, like Macedonia, endeavors to adapt to evolving economic circumstances while its populace actively pursues employment opportunities and alternative income sources (Richardson, 2021). Tourists visiting various countries engage in economic transactions, spending their financial resources and subsequently departing from the destination (Le Thanh & Le Kien, 2020).

As tourists spend, they contribute to the establishment of infrastructure, opportunities, and services that enhance the desirability of the country's way of life for the indigenous populace. The revenue generated from visitor spending serves as a source of income and fosters opportunities for both established and emerging businesses, facilitating the creation of new job opportunities to meet the demands of an expanding population. Tourism industry personnel and enterprises contribute to the local economy through their expenditure within the community. Lewis & Chambers (2007) argue that non-front-line tourism businesses highlight the significance of expenditures made by employees within the tourism industry and by tourism businesses themselves, which are as crucial to a country as the spending by visitors.

The conveyed information holds significant importance. The influx of retiring individuals into a country's population engenders new societal needs and requirements. Without a consistent and sustainable influx of financial resources, the population may exceed its carrying capacity, potentially leading to the deterioration of municipal services and increased responsibility for an elderly demographic that relocated to the area expecting superior service standards. According to Mihalic (2000), the community faces new demands even without population growth. Hence, it is imperative for the residential and business communities of our nations to acknowledge and celebrate the impact of tourism on their way of life while actively pursuing avenues to enhance the favorable economic and social outcomes associated with tourism (Richardson, 2021). The significant population growth in Nigeria presents a matter of utmost importance.

Tourism is an expanding and intricate phenomenon that is progressively emerging as one of the foremost economic activities globally. It encompasses a confluence of sectors, including tour operators, travel agencies, tour guides, transportation, accommodation, recreation and entertainment, and food and beverage services.

The consumptive behaviors of visitors, including the purchase of both tourism-related and non-tourism goods and services, exert a direct influence on the intricate nature and organizational framework of the tourism industry. The actions of tourists have implications for various industries, including those not directly connected to tourism, such as visual art, artifacts, beads, and street foods (Le Thanh & Le Kien, 2020).

Cultural preservation

The interdependence between culture and tourism can enhance the allure and competitiveness of destinations, regions, and nations (Lopes & Hiray, 2024). The growing significance of culture as a component of tourism contributes to creating uniqueness in a highly competitive global market. Simultaneously, tourism serves as a significant avenue for enhancing the value of culture and generating revenue that can bolster and fortify cultural heritage, cultural production (Lopes & Hiray, 2024), and creativity. According to a recent publication by the Organization for Economic Cooperation and Development (OECD 2009), strengthening the connection between tourism and culture can increase the appeal of destinations, thereby augmenting their competitiveness as desirable places to reside, explore, engage in economic activities, and invest (Noonan, 2023).

This study examines the experiences of locations where cultural resources play a significant role in enhancing overall appeal, identifying the key factors that contribute to the successful development of these resources for tourism purposes. The primary objective of the OECD study is to identify crucial factors and policy interventions that optimize the appeal of certain locations as tourism destinations, residential areas, and attractive sites for foreign investment.

The report synthesizes a diverse array of data on the interplay between tourism and culture, drawing from case studies conducted in Australia, Austria, France, Greece, Italy, Japan, Korea, Mexico, Poland, Portugal, Romania, Slovakia, and Turkey. This synopsis of the OECD report provides an overview of the primary findings and establishes connections between them and ongoing discussions surrounding tourism and culture.

The interconnection between culture and tourism has been widely acknowledged due to the recognition of cultural assets' significance in attracting tourists and differentiating destinations (Noonan, 2023). The increasing intertwining of culture and tourism has been influenced by various factors (Richards, 2007). Globalization has significantly impacted the role of culture in local identity formation. Additionally, rising education levels and an aging population have heightened interest in cultural and heritage matters. The proliferation of postmodern consumption patterns, coupled with a strong inclination towards novel experiences, has significantly expanded various industries. Cultural tourism has emerged as a significant contributor to employment and economic gains, serving as a catalyst for regional growth and establishing a distinctive identity within an increasingly competitive tourism industry (Noonan, 2023).

The widespread adoption of cultural tourism by governments worldwide can be attributed to its positive perception as a desirable form of tourism (Richards, 2001). The amalgamation of tourism and culture has become a highly influential catalyst for economic growth (Khan & Alam, 2023). According to a report by Europa Nostra in 2005, cultural heritage plays a significant role in driving tourist activity in Europe, accounting for over 50% of such activity. Furthermore, cultural tourism is anticipated to experience the highest growth within the broader tourism sector. According to Richards (2007), UNWTO estimates that cultural tourism constitutes approximately 40% of international tourism. The ATLAS (2008) study indicates a consistent increase in the percentage of cultural visitors motivated by cultural tourism, rising from 17% in 1997 to over 30% in 2008.

Cultural tourism policies have become increasingly prevalent globally, spanning continents, nations, and regions (Khan & Alam, 2023). In the European context, the European Commission actively advocates for cultural tourism (Noonan, 2023) as a strategy to reinforce the concept of 'unity in diversity' among the European Union's population. Traveling to experience different cultures enables tourists and hosts to appreciate the diversity of cultural practices while recognizing the fundamental connections between various cultural groups. In Australia and Canada, the interconnection between culture and tourism has fostered economic prospects for indigenous communities. Cultural tourism is frequently regarded as a strategy for preserving heritage and enhancing local economies in Africa, Latin America, and Asia (Richards, 2007).

Cultural institutions have been strategically employed in numerous urban areas as catalysts for the revitalization of deteriorated regions, stimulating local economies, and augmenting property valuations (Khan & Alam, 2023). Tourism is employed in rural regions to bolster traditional livelihoods and crafts while supporting communities at risk of out-migration. As exemplified by Lopes & Hiray (2024), individuals attending summer festivals in Gaelic-speaking regions of the Scottish Highlands contribute essential financial resources to isolated areas and play a crucial role in preserving the indigenous language and cultural practices. Cultural tourism holds significant importance for rural regions due to the limited availability of alternative revenue streams. The correlation between tourism and culture is further exemplified by the governance frameworks established at both national and regional levels. At least 25 nations have implemented integrated administrative frameworks encompassing both cultural and tourism sectors. There has been a shift from product-oriented to process-oriented or "way of life" definitions of culture. Tourists increasingly seek destinations that offer opportunities to immerse themselves in the local lifestyles, everyday culture, and customs of the host community.

In recent decades, various regions have faced increasing economic and social challenges, leading to a shift toward more instrumental policies concerning tourism and culture. The rationale behind preserving cultural heritage is often articulated in economic terms, emphasizing that such efforts can generate employment opportunities and contribute to cultivating an appealing image that attracts tourists and encourages investment. This phenomenon is particularly evident in regions undergoing economic reorganization. Case studies conducted by the Organization for Economic Co-operation and Development (OECD) suggest that the primary factors motivating the formulation of culture and tourism policies are:

- Appreciation and conservation of cultural heritage
- Facilitating economic growth and job creation
- Revitalizing both the physical and economic aspects of a region
- Enhancing and broadening the scope of tourism
- Sustaining the local population
- Fostering intercultural awareness and appreciation

Physical accessibility poses a significant challenge in numerous regions. In cases where a region has substantial potential for cultivating cultural assets for tourism, successfully integrating these assets into the tourism product becomes difficult if they are not readily accessible to tourists. Consequently, many of the regions under examination have prioritized infrastructure development. A significant proportion of the OECD case studies pertain to predominantly rural areas or regions previously industrialized and currently undergoing restructuring, rather than metropolitan or major urban areas.

Despite participating in a shared competitive endeavor to enhance their appeal and attract investment, various regions possess distinct capabilities and, consequently, strategic choices for fostering cultural and tourism development. The European Travel Commission's (2005) review of City Tourism and Culture emphasized the variations in development opportunities among major metropolitan centers, smaller cities, and villages. Larger cities can utilize creative assets to cultivate a distinct atmosphere and uniqueness, as suggested by Florida, whereas smaller locations tend to rely more heavily on their heritage. In major urban centers, the concept of 'image' assumes heightened significance relative to other locales.

Across various geographical areas, there is a growing trend to develop culture and tourism policies aimed at generating externalities that positively impact the local economy (Simorangkir et al., 2024). The primary aims of culture and tourism programs are thus associated with enhancing the economic, cultural, and social standing of designated regions. Typically, broad objectives are established, often centered around increasing tourist volumes or attracting specific segments of tourists.

The case studies reveal several key policy actions:

- Improving and enhancing infrastructure
- Preserving heritage
- Developing and enhancing the economy
- Enhancing and developing regional image
- Expanding tourism into previously unexplored regions
- Improving the quality of tourism and tourism facilities

Culture and tourism are widely recognized as significant catalysts for the regional economy, yielding various favorable outcomes. These include generating employment opportunities, providing income to sustain cultural establishments, preserving regional uniqueness, expanding tourism to previously untapped regions, and mitigating the effects of seasonal fluctuations. Enhancements to local culture stimulate the local populace's appreciation and conservation of their cultural heritage, instilling a revitalized sense of pride in their community. This has led several administrations to implement initiatives aimed at fostering cultural awareness and promoting heritage preservation within the local population. Including local communities in planning and implementing cultural tourism initiatives is a prevalent characteristic observed in various programs, such as those in Japan, Mexico, and Korea.

Income growth

The relationship between income and demand is a prominent focus within the field of economics. The correlation between tourism demand, air travel demand, and residential water demand has been extensively studied and documented in various academic publications (Wang & Tziamalis, 2023). Meta-analyses conducted by Crouch (1995), Peng et al. (2014); (2015), Gallet & Doucouliagos (2014) have contributed significantly to the existing body of research. Numerous scholars, including Crouch (1995), Lim (1997), Peng et al. (2015), have acknowledged income in origin markets as a major explanatory factor in international tourism demand.

The examination of the correlation between income and demand for recreational activities originated in the 19th century, as elucidated by Engel's law. Subsequently, a multitude of studies have been conducted to explore the correlation between income levels and the demand for tourism. Understanding the dynamics of tourism demand, including its inherent characteristics and its correlation with income (Wang & Tziamalis, 2023), holds significant importance for both scholars and industry professionals, primarily due to the perishable nature of tourism offerings.

Dwyer et al. (2010) emphasize the importance of comprehending tourism demand and its predictive analysis for professionals in the tourism industry, including marketers, managers, planners, and public agencies. The correlation between income and tourism demand is typically assessed using the income elasticity of tourism demand, which relies on macroeconomic data and employs time series and panel data for analysis. Recently, researchers have conducted investigations using consumer surveys to evaluate the correlation between income and expenditure in the tourism sector (Bronner & Hoog, 2016). The literature on the income elasticity of tourism demand, as examined in various studies (Crouch, 1995; Peng et al., 2015), reveals that the income elasticity of tourism demand is influenced by several factors, including the choice of explanatory and dependent variables, the time periods of data collection, the methodologies employed, and the specific origin and destination pairs under investigation. In their study, Song et al. (2010) discovered that the primary indicators used to gauge tourism demand are the number of tourist arrivals and their corresponding expenditures. Researchers have also utilized the number of overnight stays by tourists and the duration of their visits as alternative proxies.

Quantifying the volume of visitors to a particular destination can be challenging when conducting frontier counts for international visitors (Wang & Tziamalis, 2023). However, statistical reports from accommodation facilities provide readily accessible data on the number of tourist arrivals and overnight stays. Tourist expenditures are documented as international receipts and expenditures in a country's balance of payments. These expenditures are typically assessed through visitor surveys, which can present challenges in data collection and potential inaccuracies (Frechtling, 1987).

Income is commonly assessed through indicators such as nominal or real GDP, or GDP per capita. According to Song & Li (2008), personal disposable income or private consumption is a more suitable measure of income for examining leisure tourism. Previous studies have employed alternative indicators of income, including industrial production indices (Gonzales & Moral, 1995, as cited in Peng et al., 2015) and foreign travel budgets (Smeral & Witt, 1996, as cited in Peng et al., 2015). Additionally, it is worth noting that the demand for tourism can also be impacted by previous income levels in the source market, as there may be a time lag before changes in income affect tourism demand (Lim, 1997).

The concept of income elasticity of tourism demand refers to the responsiveness of the quantity demanded of tourism goods and services to changes in income levels. Research on the income elasticity of tourism demand has garnered growing attention since the 1960s, as evidenced by studies conducted by Crouch (1995), Smeral (2004), and Peng et al. (2014). The relationship between tourism demand and income has been extensively studied through the utilization of income elasticity, a metric that quantifies the responsiveness of tourism demand to variations in income. More precisely, it refers to the proportion of the percentage variation in demand for tourism relative to the percentage variation in income.

Crouch (1995) conducted a meta-analysis on tourism demand, revealing that approximately 70% of the estimated income elasticities of international tourism demand exhibited income elasticity coefficients exceeding 1. Additionally, 5% of the

estimated income elasticity was negative, indicating either an undesirable destination or potential errors in estimation. The role of income as a significant determinant of tourism demand has led to the recognition of income-elastic international tourism demand as a crucial catalyst for the expansion of the tourism industry. Peng et al. (2015) discovered that the income elasticity of tourism demand exhibits greater magnitudes when measured in terms of tourist arrivals compared to expenditure.

Furthermore, the income elasticity of tourism demand depends on the method of income measurement. It has been observed that the inclusion of permanent income in the analysis results in a higher income elasticity compared to when only current income is considered. Additionally, the income elasticity is found to be sensitive to the composition of the sample population under investigation, namely whether it comprises solely individuals who engage in travel or the entire population (Alegre & Pou, 2016). Smeral's (2004) study examined the income elasticity of demand for outbound tourism from 1975 to 1999. The findings revealed that international outbound tourism exhibited characteristics of a luxury good, as it demonstrated income elasticity in 24 out of the 25 countries analyzed. Subsequent research has also indicated that inbound international tourism can be classified as a luxury good. This is exemplified by the investigation into tourism demand in Spain conducted by Garin-Munoz (2006) and the study on Turkey by Dogru et al. (2017).

International tourism is commonly acknowledged in scholarly literature as having a high degree of income elasticity. However, it is important to note that international tourism may exhibit characteristics akin to essential commodities, particularly when the destinations are close to the markets of origin. According to the study conducted by Vodeb et al. (2016), Slovenia is acknowledged as an essential destination for tourists from Austria and Italy, likely due to time and financial convenience. This observation aligns with the conclusions drawn by Peng et al. (2015), which indicate that long-haul travel is perceived as more opulent, exhibiting greater income elasticity coefficients compared to short-haul travel.

Typically, research on the income elasticity of tourism demand primarily focuses on the broader domain of tourism demand. When considering the perspective of tourism suppliers, it is more suitable to examine the income elasticity of particular tourism products. In a study conducted by Divisekera (2010), the author examined the consumption patterns of tourists visiting Australia from various foreign-origin markets. The research revealed that the coefficient of income elasticity of inbound tourism demand varied across different tourism products. In the realm of tourism, accommodation is commonly regarded as a luxury, while shopping is perceived as a necessity. The income elasticity of other tourism products varies depending on the specific origin market.

Employment generation

Since the early 1990s, scholars such as Bote (1990) have noted that extensive evidence supports the idea that the tourism industry can generate more employment opportunities per unit of investment compared to many other industrial sectors. However, it is important to recognize that existing research in this area has primarily focused on the hospitality sector. Consequently, if the analysis were expanded to include restaurants and supplementary accommodation services, the findings would likely present an even more favorable outlook for the tourism industry. Additionally, transportation activities play a significant role in job creation, with a majority of these positions being sourced from local labor markets (UNWTO and ILO, 2014). According to Banskota (2012), tourism is considered a labor-intensive industry. Furthermore, it is argued that a significant number of positions generated by the tourism sector are filled by women, thereby promoting gender equality.

Tourism can generate employment opportunities, both directly and indirectly. It is noteworthy that tourism contributes to the employment of individuals with varying levels of skill and expertise. According to Loría et al. (2017), empirical evidence from Mexico suggests that a rise in the influx of international tourists has a significant impact on decreasing the unemployment rate. Isik (2015) highlights a relationship between tourism development and foreign direct investment. This relationship is considered significant for analyzing sectoral employment in Mexico (Normann & Ramírez, 1994). Consequently, the potential of tourism to alleviate unemployment is enhanced. However, the positive impact of tourism can be undermined by instances of violence, as these incidents can deter tourists and result in the loss of temporary employment opportunities, consequently reducing the supplementary income of residents (Andrés-Rosales et al., 2018). The tourism industry exhibits notable fluctuations in demand throughout the year, resulting in distinct high, medium, and low seasons (Normann & Ramírez, 1994). Nevertheless, the extent to which these seasonal variations affect the industry depends on the level of development within specific subsectors, such as business tourism and congress tourism, which are not susceptible to seasonal fluctuations (Normann & Ramírez, 1994). Employment within the tourism sector is influenced by seasonal fluctuations, which vary based on the time of year and the specific regions within a country (UNWTO and ILO, 2014).

The nature of employment in the tourism industry is predominantly temporary. Many businesses within the sector address seasonality challenges by employing students seeking temporary or part-time positions, as well as individuals seeking supplementary work. However, these characteristics pose obstacles to achieving employment stability within the tourism industry, and wages in this sector frequently fall below the average (Jolliffe & Farnsworth, 2003).

Infrastructure is a fundamental driver of tourism growth and development, providing a diverse array of services designed to enhance visitor satisfaction and overall travel experiences (Mzobe & Nyikana, 2024). Jovanović and Ilić (2016) argue that substantial investments in tourism infrastructure are essential fostering future advancements in the tourism industry. According to Mandić et al. (2018), the level of infrastructure and facilities in the tourism industry is influenced by the willingness of tourism entrepreneurs to invest in infrastructure development. However, financial limitations often hinder their willingness to invest. Consequently, the current phase of tourism development in a region becomes the determining factor for the level of infrastructure and facilities available. It can be deduced that for there exists a positive correlation between the level of infrastructure and the potential employment opportunities generated by the tourism industry.

Based on the aforementioned analysis, it can be inferred that the labor-intensive nature of tourism is anticipated to positively impact reducing unemployment. The expansion of the tourism sector is expected to serve as a remedy for unemployment, aligning with the growth-rate interpretation of Okun's law. In contrast, tourism is closely associated with individuals' income levels (Stabler et al., 2010). This is because travel tends to occur once individuals have satisfied their basic needs (Kim et al., 2014). Furthermore, it is widely acknowledged in the literature that tourism is classified as a luxury good (Smeral, 2003). Consequently, according to the established definition, the demand for tourism should exhibit a greater than proportional increase in response to income growth (Varian, 1992). In this context, a primary factor that may hinder travel at a given time is the necessity for prospective travelers to accumulate funds to meet their requirements as well as the expenses associated with the journey. Non-demand arises when potential travelers face financial constraints (Panosso & Lohmann, 2012), although they may potentially seek financial assistance through credit options.

According to Aynalem et al. (2016), individuals who are unemployed face challenges in generating income. Consequently, this circumstance may lead to a deferral or complete abandonment of travel plans for leisure purposes. Alegre et al. (2018) posit that unemployment significantly impacts the likelihood of individuals refraining from taking vacations. An escalation in unemployment results in a decline, primarily, in the quantity of tourist arrivals and subsequently in the demand for commodities and services specifically tailored for tourists. As a result, there is a contraction in the Gross Domestic Product (GDP) of the tourism sector. It is noteworthy that the unemployment rate of a country can impact both outbound and domestic tourism demand. However, the primary detrimental impact on the growth of the tourism sector would arise from a decrease in the number of domestic tourists.

Poverty alleviation

Alleviating poverty poses a substantial challenge, particularly for nations undergoing transitional phases like Nigeria, where the tourism sector holds significant potential to make noteworthy contributions. Nevertheless, it is imperative to critically examine the fundamental principles underlying specific policies and measures that can enhance the efficacy of tourism, such as the opportunities afforded by microcredit. The significance of tourism in mitigating poverty was analyzed in the 2004 report titled "Tourism and Poverty Alleviation: Recommendations for Action," published by the World Tourism Organization (WTO). Seven distinct domains of intervention can be employed by tourism development initiatives to combat poverty, with several of these domains closely associated with the opportunities presented by microcredit.

Upon careful examination of each of these approaches, it is essential to formulate a methodology for selecting the most efficacious projects from two distinct perspectives: interest in tourism and impact on poverty alleviation. The seven distinct approaches to effectively benefit impoverished communities through the development of tourism are as follows:

1. Utilization of Impoverished Individuals in Tourism Enterprises
2. Provision of Goods and Services by Individuals from Low-Income Backgrounds to Enterprises within the Tourism Industry
3. Direct Exchange of Goods and Services between Individuals from Low-Income Backgrounds and Tourists
4. Establishment and Administration of Tourism Enterprises by Individuals Experiencing Poverty
5. Implementation of Tourism Taxation to Improve the Welfare of Economically Disadvantaged Individuals
6. Voluntary Actions Undertaken by Tourism Enterprises and Tourists
7. Investment in Fundamental Infrastructure to Foster Tourism while Addressing Socioeconomic Disparities

According to Shah (2023), the adoption of these methods can vary depending on the specific tourism projects under consideration, with the option to implement them individually or in combination.

Research model and hypotheses

The literature review showed a gap in addressing the mediating role of the three factors - cultural preservation, income growth, and employment generation – between tourism development and poverty alleviation especially in developing countries such as Lebanon. Analyzing the gaps in the literature review, a conceptual research model was generated. Constructing a conceptual model in academic research is critical for bringing clarity, direction, and consistency to the research. It aids in the definition of constructs, the direction of research design, the provision of a theoretical underpinning, the improvement of communication, the identification of research gaps, and the maintenance of the research process's consistency and coherence. Figure 1 represents the conceptual research model of this study.

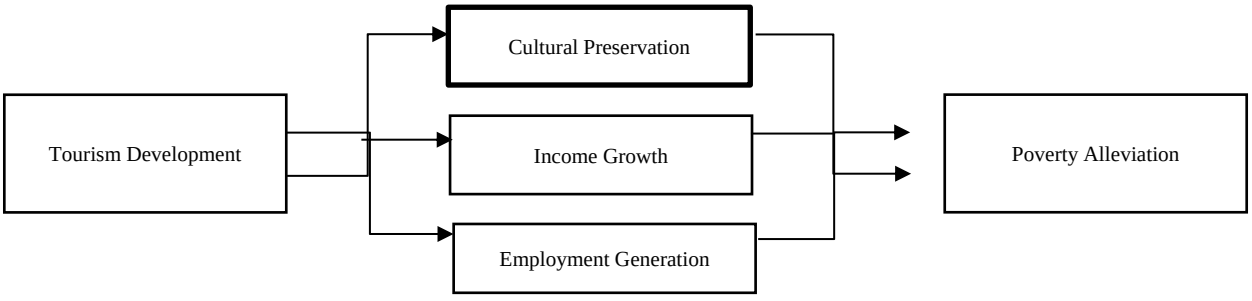


Figure 1. Research model (developed by the authors)

The conceptual research model shows one independent variable (Tourism Development), three mediators (Cultural Preservation, Income Growth, and Employment Generation), and one dependent variable (Poverty Alleviation) (Figure 1).

Therefore, six hypotheses were proposed in this research as follows:

H1: Tourism Development has a positive impact on Cultural Preservation
H2: Tourism Development has a positive impact on Income Growth
H3: Tourism Development has a positive impact on Employment Generation
H4: Cultural Preservation has a positive impact on Poverty Alleviation
H5: Income Growth has a positive impact on Poverty Alleviation
H6: Employment Generation has a positive impact on Poverty Alleviation

MATERIALS AND METHODS

The gaps identified in the literature revealed a need to study the impact of tourism development on poverty alleviation, especially in developing countries that are less investigated. Considering the mediating factors from different perspectives such as cultural societal, and economic enriches the study. Thus, this study examines the impact of tourism development on poverty alleviation with the mediation of three factors: cultural preservation, which is widely regarded as a favorable form of tourism due to its numerous advantages, often compared to other tourism offerings; income growth, which contributes to a deeper understanding of the dynamics underlying the demand for tourism; and employment generation, which represents the employment opportunities in the hospitality sector. This study's population consists of people working in Lebanese tourism organizations. Participants are selected using a stratified random selection technique.

It guarantees that each subgroup of the population is correctly represented within the sample. The survey was distributed to a sample of 270 respondents, 223 of whom returned. After cleaning the data, 202 responses were deemed valid for analysis resulting in a 75% response rate. The sample promotes diversity across industries and organization sizes. The primary data was collected through a structured questionnaire designed to obtain quantitative data about the impact of tourism development on poverty alleviation distributed online through Google Forms. A pilot test was done before collecting data to determine the questionnaire's reliability and validity by directing it to 18 specialists who provided critical input on the survey's clarity and effectiveness. Based on the pilot test results, amendments were made to the initial questionnaire. The demographic characteristics of the sample are presented in Table 1.

Table 1. Demographic information of the Sample

Category	Frequency	Percentage (%)
Gender		
Male	86	42.6%
Female	116	57.4%
Education		
Bachelor	104	51.5%
Master	81	40.1%
Doctorate	17	8.4%
Years of Experience		
0 – 3	71	35.1%
4 – 8	82	40.6%
8 – 15	36	17.8%
More than 15	13	6.5%

In the following parts, factor analysis for all variables is performed, using the SPSS software which aids in simplifying complex data sets, uncovering underlying patterns, and enhancing the validity and reliability of measurement instruments across various fields of research. Communalities are a key part of factor analysis, as a statistical method used to identify underlying relationships between measured variables. Communalities are crucial for understanding how well the factor model explains each variable's variance, guiding decisions on model adjustment and interpretation of the factor analysis results. A question with an extraction of more than 0.5 is accepted, whereas any question with less than 0.5 is removed from the scale. The mean and standard deviation for all the survey constructs were computed to evaluate the responses and measure the dispersion between them (Table 2).

Table 2. Descriptive statistics and factor analysis

Construct	**Mean**	**Standard Deviation**	**Factor analysis**
Tourism Development	4.17	0.74	
I understand the concept of sustainable tourism	3.95	0.86	0.59
Well-managed attractions are most important to attract tourists	4.31	0.72	0.77
A sustainable tourism framework would be beneficial for the community	4.23	0.76	0.60
Protecting local cultural heritage and tourism can be compatible	4.21	0.68	0.67
Natural resources protection and tourism could be compatible	4.23	0.73	0.62
Tourism education is of high importance in educational curricula	4.09	0.70	0.56
Cultural Preservation	4.18	0.72	
I share ideas with people who have different beliefs	4.25	0.69	0.59
I tend to make people who are different than me heard and accepted	4.12	0.73	0.60
I involve people who are culturally different in team decision-making processes	4.18	0.75	0.58

Income Growth	3.90	0.93	
There are sufficient training tourism institutes to qualify graduates to work in the tourism industry	3.90	0.82	0.51
The wages of tourism professionals are higher than the average local wages	3.93	0.89	0.58
Incentives are available in the tourism private sector	4.00	0.84	0.55
The tourism industry provides social security for employees	3.88	0.87	0.71
The tourism industry provides child support for employees	3.93	1.06	0.73
Jobs in tourism are stable	3.77	1.10	0.66
Employment Generation	3.94	0.81	
The tourism programs offered in educational institutions are commensurate with the requirements of the labor market	3.79	0.79	0.53
The wages commensurate with the nature of work and productivity in tourism professions	3.82	0.78	0.60
Financial incentives are available in the tourism private sector which helps reduce unemployment	3.99	0.83	0.59
The wages of the tourism private sector are sufficient	3.99	0.80	0.54
The private sector has a clear role in providing job opportunities in professional tourism institution	4.06	0.81	0.61
The private sector has after-recruitment characteristics that help to reduce unemployment	4.01	0.85	0.61
Poverty Alleviation	4.30	0.89	
Tourism facilitates the access of poor people to basic infrastructure	4.11	0.99	0.75
Tourism reduces migration from the country to cities	4.12	1.02	0.74
Tourism leads to an increase in government revenues	4.50	0.75	0.62
Tourism SMEs operate in local areas where poverty is a problem	4.25	0.96	0.60
Tourism attracts foreign investments	4.51	0.76	0.53

The respondents agreed the most with the constructs associated with tourism development: well-managed attractions are most important to attract tourists (4.31), a sustainable tourism framework and natural resources protection is beneficial for the community (4.23); cultural preservation: sharing ideas with people of different beliefs (4.25); income growth: incentives are available in tourism private sector (4.00); employment generation: private sector has a clear role in providing job opportunities in professional tourism institution (4.06). The respondent highly agreed with the constructs associated with poverty alleviation: tourism attracts foreign investments (4.51), leads to an increase in government revenues (4.50), and operates in the local areas where poverty is a problem (4.25).

Overall, the responses support the relationship between tourism development and poverty alleviation in Lebanon.

RESULTS AND DISCUSSION

The data gathered was analyzed in order to ensure the reliability and validity of the proposed research model, verify the relationship between the variables, and test the proposed research hypotheses.

The following tests were used in this study:

- The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity; Cronbach's Alpha measure of reliability;
- Collinearity statistics; The model goodness of fit; Pearson correlation; SEM; Sobel test

KMO measure and Bartlett's test of sphericity are both preliminary tests used to assess the suitability of data for factor analysis in SPSS. They help determine whether the data is appropriate for factor analysis and provide insight into the quality of the relationships among variables. KMO should be greater than 0.6 so that the factor analysis is appropriate and that the data has sufficient common variance. Bartlett's test of Sphericity significance should be less than 0.05 to indicate if the correlation matrix is sufficient to justify the use of factor analysis.

This study's results meet the thresholds of both tests and appear significant (Table 3). The reliability of the constructs is measured through the Cronbach's Alpha coefficient, which evaluates how closely related a set of indicators are as a group. It is commonly used to assess the internal consistency of the items within questionnaires, ensuring that they are consistently measuring the same underlying construct. Cronbach's Alpha generated for the variables in this study are all greater than the threshold of 0.7 indicating the internal consistency between constructs is good (Table 4).

Table 3. KMO and Bartlett's Test

Variable	KMO	Chi-Square	DF	Significance
Tourism Development	0.77	285.56	15	0.000
Cultural Preservation	0.66	70.07	3	0.000
Income Growth	0.89	558.61	15	0.000
Employment Generation	0.88	451.98	15	0.000
Poverty Alleviation	0.78	523.71	10	0.000

Table 4. Cronbach's Alpha measure of reliability

Variable	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
Tourism Development	0.768	0.770	6
Cultural Preservation	0.700	0.700	3
Income Growth	0.876	0.877	6
Employment Generation	0.856	0.856	6
Poverty Alleviation	0.862	0.864	5

Collinearity statistics are conducted through Tolerance and Variance Inflation Factor (VIF) indicators to ensure there are no multicollinearity issues between the variables. Tolerance results are all greater than 0.2 and VIF results are all below 5, meeting the thresholds and revealing no multicollinearity problems (Table 5).

Table 5. Collinearity statistics

Variable	Tolerance	VIF
Tourism Development	0.539	1.855
Cultural Preservation	0.609	1.641
Income Growth	0.258	3.883
Employment Generation	0.238	4.201

Table 6. Model of fit indicators

CMIN	DF (degree of freedom)	CMIN/DF	RMR	GFI	CFI	TLI
841.58	293	2.8	0.05	0.8	0.8	0.8

The model goodness of fit was assessed through different indicators as reported in Table 6.CMIN is used to compare the variables to determine if the sample data and the model are an acceptable fit in the analysis in case CMIN/DF is less than 3 which is proved in this study at 2.8. The Root Mean Square Residual (RMR) of 0.05 < 0.08 indicates that the size of the model and the number of variables in this study are acceptable. The most common fit indices when assessing the model fit are the Goodness of fit (GFI), the comparative fit (CFI), and Tucker-Lewis (TLI) indices which are analyzed together to determine the model goodness of fit where a value greater than 0.9 indicates an acceptable fit. The indices computed in this study show a 0.8 value close to 0.9 indicating a reasonable fit. In addition, the common method variance in this study is equal to 40% less than 50% indicating the validity of the data with no bias recognized. The conceptual model generated from SPSS AMOS shows the relationship between the different variables in this study (Figure 2).

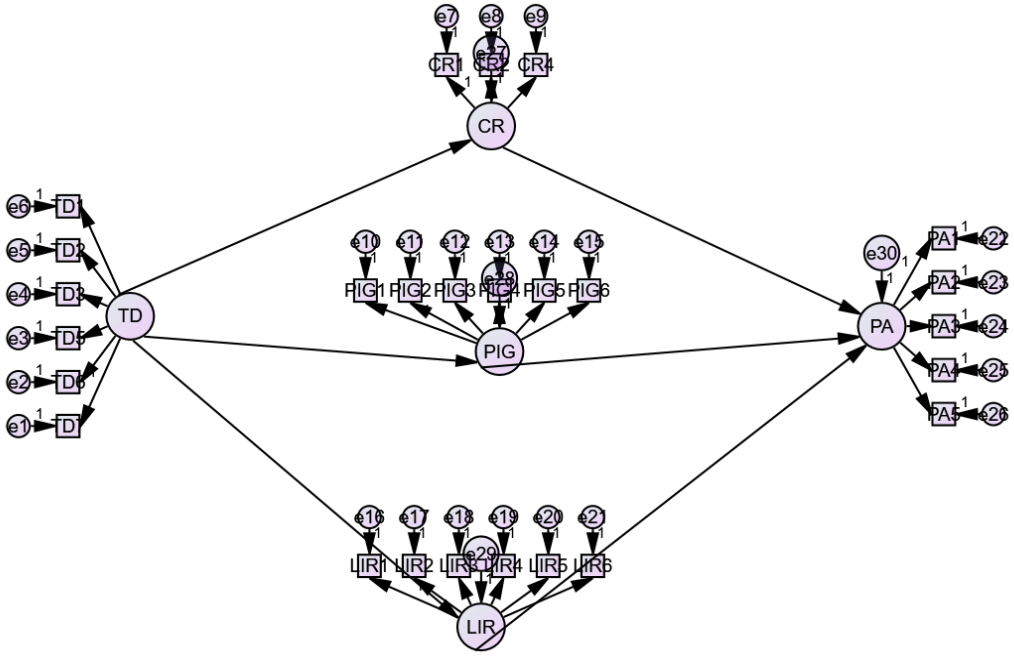


Figure 2. Conceptual model (SPSS AMOS)

To measure the significance of the relationship between the variables, the Pearson Correlation Coefficient was computed. All results appear to be positive with a p-value of less than 0.01 which proves the significant positive relationship between the variables (Table 7). The structural equation modelling (SEM) technique was used to validate the proposed research hypotheses. SEM is a powerful statistical technique for hypothesis validation that offers several advantages over traditional methods available in SPSS. It allows for the simultaneous examination of multiple relationships between variables, including both direct and indirect effects. Table 8 reveals the validation of this study's hypotheses.

Table 7. Pearson correlation (** Correlation is significant at the 0.01 level (2-tailed).)

	Tourism Development	Cultural Preservation	Income Growth	Employment Generation	Poverty Alleviation
Tourism Development	1	0.610**	0.390**	0.479**	0.474**
Cultural Preservation	0.610**	1	0.349**	0.348**	0.367**
Income Growth	0.390**	0.349**	1	0.858**	0.763**
Employment Generation	0.479**	0.348**	0.858**	1	0.770**
Poverty Alleviation	0.474**	0.367**	0.763**	0.770**	1

Table 8. SEM results

Hypotheses	Estimate	S.E.	C.R.	p-value	Evidence
H1	0.530	0.116	4.564	***	Supported
H2	1.233	0.174	7.100	***	Supported
H3	1.304	0.178	7.318	***	Supported
H4	-0.140	0.192	-0.730	0.466	Not Supported
H5	0.803	0.323	2.482	0.013	Supported
H6	0.719	0.342	2.105	0.035	Supported

The SEM results prove that there is a significant positive effect of tourism development on cultural preservation, income growth, and employment generation (H1, H2, and H3 are supported); income growth and employment generation have a significant positive effect on poverty alleviation (H5 and H6 are supported); while the relationship between cultural preservation and poverty alleviation is proved to be not significant (H4 is not supported).

These results support the review of the literature and reveal that tourism development in Lebanon contributes to the growth in income through the revenues generated by this sector and contributes to employment through the job created by this industry which is named the main industry in the country. Consequently, the growth in income and employment generation leads to a decrease in the level of poverty in the country.

The Sobel test is performed in order to prove the significant role of mediating variables, cultural preservation, income growth, and employment generation between tourism development and poverty alleviation (Table 9).

Table 9. Sobel test

Mediator	Sobel Statistics	p-value
Cultural preservation	1.97	0.024
Income growth	3.56	<0.01
Employment generation	4.24	<0.01

The results reveal that among the mediators, employment generation has the most significant role with the highest Z score of 4.24, and income growth has a significant role with Z score of 3.56, both greater than 2 with a p-value of < 0.01. However, the cultural preservation role is deemed less significant with a Z score of 1.97 less than 2, and a p-value > 0.01. The Sobel results are in line with the SEM results which proved that cultural preservation does not have a significant positive effect on poverty alleviation, and it does not serve as an important mediator between tourism development and poverty alleviation as well.

CONCLUSION

This study demonstrates the significant role of tourism development in alleviating poverty in Lebanon, particularly through employment generation and income growth. The SEM validated five of the six proposed hypotheses, confirming that employment generation and income growth serve as critical mediators in reducing poverty. In contrast, cultural preservation was found to have a limited direct impact on poverty alleviation. These findings resonate with prior literature emphasizing tourism's potential to foster economic growth in developing countries, particularly in rural and underserved areas. Previous research, such as Mitchell & Ashley (2010), highlights tourism's capacity to drive income redistribution and job creation, which aligns with our findings regarding tourism's impact on poverty alleviation through employment generation. Furthermore, studies like those by Medina-Muñoz et al. (2016) and Simorangkir et al. (2024) support the view that tourism can act as a sustainable development catalyst, particularly in resource-constrained regions. However, our study adds to this body of work by providing empirical evidence from Lebanon, a context with unique socio-economic challenges.

Lebanon's rich cultural heritage, diverse geography, and gastronomic traditions offer unparalleled opportunities for tourism, yet these remain largely untapped due to persistent geopolitical constraints, including political instability, economic crises, and inadequate infrastructure. These challenges limit tourist inflows and stifle investments in the sector. By comparison, countries like Jordan and Morocco have successfully marketed their cultural and natural attractions through stable policies and well-developed infrastructure, while Egypt, despite political instability, sustains tourism by promoting its globally renowned heritage sites alongside significant investments in tourism promotion. Similarly, Tunisia has diversified into coastal and cultural tourism, and Oman has focused on eco-tourism and luxury experiences to attract high-value visitors. Lebanon's unique blend of ancient history, vibrant traditions, and geographic diversity, however, sets it apart and provides an unmatched opportunity to create a culturally rich and sustainable tourism model. Strategic interventions, such as promoting rural tourism, investing in infrastructure, and leveraging Lebanon's distinct identity, can unlock its potential to alleviate poverty, offering lessons applicable to other Arab countries with similar socio-economic contexts.

Lebanese policymakers should prioritize creating a stable macroeconomic and political environment to attract investments in the tourism sector. Policies should focus on enhancing infrastructure, promoting rural tourism, and ensuring equitable distribution of tourism revenues to impoverished communities. The private sector can support these efforts by investing in tourism-related ventures, fostering entrepreneurship, and creating jobs in rural and underserved regions. Community stakeholders stand to benefit from opportunities to develop small businesses, such as artisanal crafts, eco-tourism, and local hospitality services, which can directly enhance income and reduce poverty. Additionally, international organizations can support capacity-building programs and infrastructure projects to bolster Lebanon's tourism potential.

It is worth noting that this research is context-specific, with data collected exclusively in Lebanon, limiting the generalizability of the findings to other countries. Furthermore, the cross-sectional nature of the study provides a snapshot of tourism's impact on poverty alleviation, without accounting for long-term effects. Future research should adopt a comparative approach, examining similar relationships across multiple Arab countries, to assess the broader applicability of these findings. Longitudinal studies are also needed to evaluate the sustained impact of tourism development on poverty alleviation over time. Additionally, future research could explore the integration of emerging technologies, such as digital platforms and artificial intelligence, to enhance tourism's economic impact and accessibility in underserved areas.

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INVESTIGATING THE IMPACT OF GREEN TRANSFORMATIONAL LEADERSHIP ON PRO-ENVIRONMENTAL BEHAVIOR IN TOUR OPERATORS. TESTING THE MEDIATING ROLE OF EMPLOYER ATTRACTIVENESS

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Abstract: In an era where sustainability is a pressing global concern, understanding the role of leadership in fostering eco-friendly behaviors within organizations is more critical than ever. Leadership not only sets the strategic direction but also shapes employees' attitudes and behaviors toward sustainability. This study investigates the direct impact of green transformational leadership (GTFL) on pro-environmental behavior (PENB) and its indirect influence through employer attractiveness (EMA) in the tourism sector. Given the increasing environmental challenges faced by the tourism industry, exploring how leadership can drive sustainability at the employee level is of paramount importance. To achieve this, data were collected from 399 tour operators in Egyptian travel agencies. The study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) to assess the relationships between key variables. The findings reveal that GTFL exerts a significant positive impact on both PENB and EMA, indicating that green leaders inspire employees to engage in environmentally responsible behaviors while also enhancing the organization's appeal to eco-conscious talent.Furthermore, the results confirm that EMA partially mediates the relationship between GTFL and PENB. This suggests that organizations with strong green leadership not only directly influence employee sustainability behaviors but also enhance their attractiveness as employers, which in turn strengthens employees' commitment to environmental initiatives. These findings fill critical gaps in the literature by empirically demonstrating the mechanisms through which green leadership fosters sustainable workplace behaviors.From a practical perspective, the study underscores the importance of cultivating green leadership practices to drive sustainability in the tourism sector. By fostering a workplace culture that prioritizes environmental responsibility, organizations can attract and retain employees who are aligned with sustainability values in the Egyptian tourismsector.

Keywords: green transformational leadership, pro-environmental behavior, employer attractiveness, tour operators, tourism sector

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INTRODUCTION

The tourism sector, as a major contributor to global economic development, faces increasing scrutiny regarding its environmental impact (Razzaq et al., 2023). Tour operators, positioned at the nexus of consumer demand and destination management, are uniquely situated to influence sustainable practices within the sector (Ogutu et al., 2023). Amid growing environmental concerns, several studies (Sobaih et al., 2022; Ayad et al., 2023; Tong, 2023; Harisinta, 2024) maintained that GTFL practices garnered considerable academic and practical interest andplays a crucial role in inspiringemployees' PENB among employees. Furthermore, GTFL may encourage employees to adopt best practices that lessen the adverse environmental impact of tourism operations by integrating environmental ideals into theorganizational culture (Tong, 2023).

GTFL is characterized by leaders who articulate a compelling environmental vision, serve as role models for sustainable practices, and provide individualized support to employees to achieve eco-friendly goals. Such leadership can nurture an organizational climate where pro-environmental behavior is not only encouraged but internalized by employees (Ayad et al., 2023; Harisinta, 2024). However, the mechanisms through which GTFL influences PENB require further exploration (Perez et al., 2023). Concerning EMA, in which an organization's ability to appeal to current and potential employees may play a pivotal mediating role in this relationship (Song et al., 2024). According to the work of Luo et al. (2024) who highlighted that the workplace perceived as environmentally responsible and values-driven is likely to attract individuals who prioritize sustainability, thereby amplifying the effects of GTFL on employee behavior.

EMA refers to the degree to which an organization is perceived as a desirable workplace by current and prospective employees (Nilsen et al., 2024). Factors contributing to EMA include a positive organizational reputation, alignment with personal values, opportunities for professional growth, and a commitment to corporate social responsibility (Rosa et al., 2024). Enterprises in which prioritize environmental stewardship and demonstrate eco-friendly practices are likely to enhance their appeal to individuals who value sustainability (Murtaza et al., 2024). PENBcomprehends the actions taken by

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individuals to minimize their negative impact on the environment (Mi et al., 2024). According to a recent study by Alherimi et al. (2024) who argued that PENB can range from simple activities like recycling and energy conservation to more complex practices such as advocating for sustainable policies within organizations. Additionally, PENB is often influenced by organizational culture, leadership, and individual attitudes towards environmental sustainability (Abbas & Tufail, 2024).

To better understand the relationship between GTFL and PENB, this study draws upon the Theory of Planned Behavior (TPB). TPB suggests that an individual's behavior is guided by three key factors: attitude toward the behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). In the context of this research, GTFL is expected to shape employees' attitudes toward environmental responsibility, strengthen social norms favoring sustainable practices, and enhance perceived behavioral control by providing the necessary resources and motivation. Furthermore, EMA may function as a mediator in this process, reinforcing employees' perceptions that their organization values sustainability and thus strengthening their intention to engage in PENB. By integrating TPB, this study aims to provide a robust theoretical foundation for examining how GTFL influences PENB in the Egyptian tourism sector and the mediating role of EMA in this relationship.

LITERATURE REVIEW& HYPOTHESES DEVELOPMENT

1. Green Transformational Leadership and Pro-Environmental Behavior

There is growing research interest in GTFL due to its potential to encourage PENB across various business contexts (Sobaih et al., 2022; Ayad et al., 2023; Goni et al., 2023; Perez et al., 2023; Harisinta, 2024; Larasati & Herachwati, 2024; Luo et al., 2024). While previous studies highlight GTFL's ability to inspire environmental commitment, a deeper analysis of its mechanisms is required. According to Larasati & Herachwati (2024), GTFL fosters a sustainability-oriented mindset by embedding environmental values into organizational leadership. However, its effectiveness depends on leaders' ability to translate this vision into actionable strategies that shape employees' behaviors (Harisinta, 2024). A critical review of the literature suggests that GTFL influences PENB through multiple pathways, including role modeling, participatory decision-making, and reinforcement of sustainability norms (Luo et al., 2024). For instance, Perez et al. (2023) argue that GTFL's impact is contingent on the alignment between leadership practices and organizational culture. With regard to hospitality and tourism context, the study of Sobaih et al. (2022) examined how GTFL could influence PENB among hotel employees. The study suggested that leaders who actively promoted environmental goals and demonstrated eco-friendly practices motivated employees to participate in environmentally sustainable activities, enhancing the overall green image of tourism destinations. Another study by Ayad et al. (2023) suggested that GTFL positively influence both organizational strategies and employees' PENB. Leaders who focus on green innovation and sustainability can inspire their teams to adopt behaviors that promote the environment and enhance the reputation of the tourism industry.

H1: GTFL positively and directly influences PENB

2. Green Transformational Leadership and Employer Attractiveness

Numerous research (i.e., Begum et al., 2022; Florek-Paszkowska & Hoyos-Vallejo, 2023; Nduneseokwu & Harder, 2023; Soni, 2023; Alabdali et al., 2024; Umair et al., 2024) explored the connection between GTFL and EMAin different contexts. GTFL emphasizes the integration of environmental values into leadership practices, fostering innovation and sustainability (Soni, 2023; Umair et al., 2024). The study of Florek-Paszkowska & Hoyos-Vallejo (2023) revealed that green leadership significantly enhances organizational image, making employers more attractive to environmentally conscious talent. Furthermore, a recent study by Rizal et al. (2024) applied on in Indonesian SMEs highlighted that GTFL fosters a culture of sustainability, which can lead to improved organizational performance and a positive corporate image. A strong commitment to environmental sustainability may enhance EMA by appealing to environmentally conscious job seekers (Begum et al., 2022). However, a recent study by Cai et al. (2024), argued that the caution against over-reliance on green initiatives, suggesting that a mismatch between green rhetoric and actual practices can harm employer credibility. In terms of hospitality and tourism context, a study by Agrawal & Pradhan (2023) wasadopted in Indian hotel sector which suggested that GTFL positively influences employees' in-role and extra-role green behaviors through environmental value congruence. Such environmentally responsible behaviors can enhance an organization's reputation, potentially making it more attractive to prospective employees. Hence, the following hypothesis was purposed:

H2: GTFL positively and directly influences EMA

3. Employer Attractiveness and Pro-Environmental Behavior

Several studies (e.g., Coelho et al., 2022; Muisyo et al., 2022; Paillé, 2022; Zaidi & Azmi, 2024; Song et al., 2024) have explored the relationship between EMA and PENB, highlighting how organizations that prioritize sustainability and environmental responsibility tend to attract employees who share similar values. The study of Muisyo et al. (2022) suggested that enterprises with strong environmental credentials, such as implementing green practices or offering sustainability-focused benefits, are more appealing to job seekers, particularly those from younger generations who are increasingly concerned with environmental issues. In addition, employees who are drawn to such organizations are more likely to engage in PENB, both at work and in their personal lives (Coelho et al., 2022). The concept of organizational values alignment, where employees feel a sense of purpose and commitment to a company that reflects their own ethical and environmental priorities (Song et al., 2024). Consequently, EMA can serve as a powerful driver of PENBamong employees, reinforcing the importance of sustainability in organizational culture (Coelho et al., 2022). Concerning tourism sector, the study by Tong (2023) explored how green tourism practices enhance competitiveness and attract workers who are more likely to engage in green practices as well as fostering pro-environmental behaviors among employees, suggesting that organizations with strong environmental values. Correspondingly, a recent research by Song et al. (2024) found that when potential tourism companies' employees perceive a prosocial orientation and value congruence with their own

environmental beliefs, it increases their intention to pursue a job, which in turn fosters greater pro-environmental behavior within the organization. This study represents one of the first attempts to measure the mediating role of employer attractiveness in the relationship between green transformational leadership (GTFL) and pro-environmental behavior (PENB). By addressing this gap, the research provides novel insights into how leadership practices influence environmental behaviors through the lens of perceived organizational appeal.Based upon these discussions, the following hypotheses were purposed:

H3: EMA positively and directly influences PENB

H4: EMA has indirect influence between GTFL and PENB

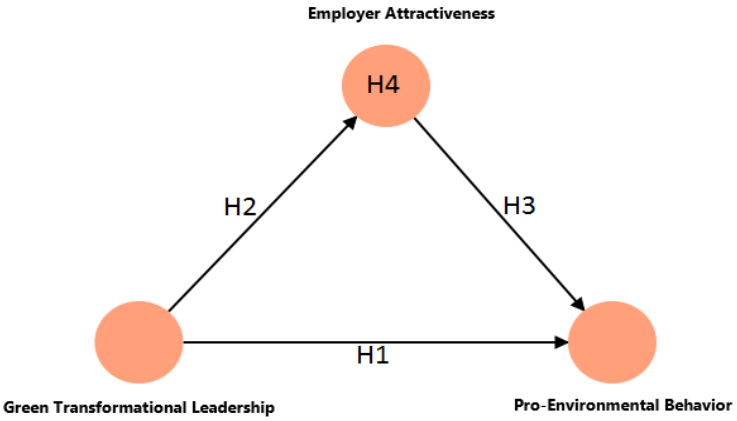


Figure 1. Study Conceptual framework

MATERIALS AND METHODS

The methodology of the study was conducted according to the following Figure 2.

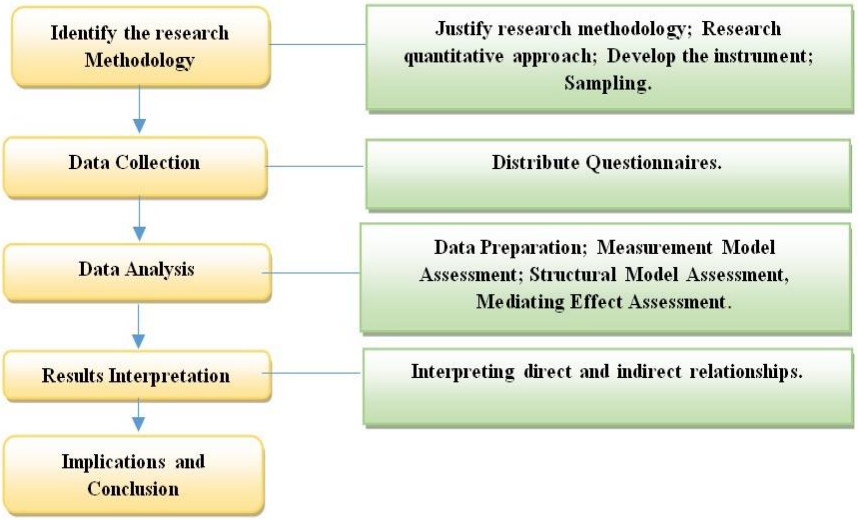


Figure 2. Research methodology flow-chart

Study constructs

The scale used to measure the variables in this study was developed based on the literature reviews.The green transformational leadership was measured by six-item scale, developed by Chen & Chang (2013). The phrases used in this scale to measure the variable are: The leader of the green innovation project takes actions that reflect the environmental values of the team members; the leader of the green innovation project motivates the team with environmental plans; the project leader motivates the team to accomplish the environmental objectives; the project leader offers a clear environmental vision for the team to follow; the leader of the green innovation project inspires the team to consider green ideas; and the leader of the green innovation project unites the team to work towards shared environmental goals. In order to measure the variable of pro-environmental behavior, the scale developed by Robertson & Barling (2013) was adopted. The scale consists of seven statements, investigating: the printing on both sides whenever I can; disposing of compostable items in the compost bin; placing recyclable materials in the appropriate recycling bins; bringing reusable utensils to work; turning off lights when they're not needed; participating in eco-friendly initiatives; and offering suggestions to managers or environmental committees to help improve my organization's environmental impact. As for the mediating variable of this study "Employer Attractiveness", the scale tested and approved by Seara et al. (2023) was adopted, consisting of 5 measurement statements, testing: Development opportunities and recognition from management; Social benefits of working with the employer; Enjoyment of working in an engaging environment; Financial benefits and job stability within the organization; Practical value of contributing by working with this humanitarian organization.

Research Population and Sampling: The study focuses on employees within the tourism industry in Egypt as the target population. Due to the challenge of accurately determining the total workforce size, an estimated population of 20,000 individuals was considered based on industry reports and labor statistics (Ayad, 2024). This estimation follows Veal's (2006) recommendations for handling large or undefined populations, ensuring a representative sampling approach. To determine the appropriate sample size, the study employed the Herbert Larkin equation (Ayad & Hasanein, 2024), which is widely recognized for its applicability in survey research. This calculation yielded a required sample size of 377 responses, which aligns with standard practices for achieving statistical power and generalizability. Additionally, to enhance methodological rigor, the survey was translated into Arabic using a back-translation approach to ensure linguistic accuracy and contextual relevance. A pilot study was conducted with 30 participants to test survey clarity, reliability, and response consistency, leading to minor modifications before full deployment. To address potential common method bias, procedural and statistical remedies were implemented, including the Harman's single-factor test to verify variance distribution.

Data collection: The study employed self-administered questionnaires as part of its quantitative research approach to collect primary data. To ensure the efficiency and validity of the questionnaire, a panel of academics and experts in the field of tourism reviewed and revised the questionnaire. In October and November 2024, the questionnaires were distributed to 414 employees working in the tourism sector in Egypt. in the end, 399 completed surveys were returned, yielding a response rate of 96.4%, and were analyzed statistically. To meet the objectives of the study, the questionnaire was divided into four sections. The demographic data was collected in the first section, and the three sections that follow concentrate on the three research variables: green transformational leadership "GTFL", pro-environmental behavior "PENB", and employer attractiveness "EMA". On a 5-point Likert scale, respondents evaluate items related to these criteria.

Data Analysis Techniques: In order to glean valuable insights from the collected data, which enabling informed decision-making, the Excel v.15-2013 and SPSS v.29-2022 were used to analyze descriptive data and to explore the sample's demographic characteristics. Additionally, the study hypotheses were tested and the relationships between all variables were examined using the partial least squares structural equation modeling PLS-SEM v.4.1.0.9.2024.

RESULTS

The Outer Model

Construct Validity: The construct validity or convergent validity test was conducted to determine whether a test that is designed to measure a specific construct correlates with other tests that evaluate the same construct, which was achieved in this study, as the analysis results showed that the reliability of all the items tested were greater than the recommended cut-off-point of 0.7 (Hair et al., 2017). Also, the composite reliability test was conducted to measure the internal consistency in scale items, and results showed that the "rho_a" of all variables were greater than 0.7, which meet the cut-off-point developed by Bryman & Cramer (2012) and Hair (2017). Moreover, and in order to measure the extent of variance that is explained by a construct in comparison to the variance due to measurement error, the average variance extracted "AVE" test was conducted. The results showed that the "AVE" of all variables were above 0.5, which meet the recommended cut-off-point of Fornell & Larcker (1981). This is a positive result, as the "AVE" for each construct in any measurement model have to be at least 0.50; otherwise the items account for more errors than the variance in the constructs. See Table 1 for more details.

Table 1. Construct validity

Variables	Items	"λ"	"AVE"	**"α"**	"rho_a"
Green Transformational Leadership "GTFL"	GTFL-1	0.909	0.655	0.900	0.941
	GTFL-2	0.761			
	GTFL-3	0.904			
	GTFL-4	0.747			
	GTFL-5	0.918			
	GTFL-6	0.761			
Pro-Environmental Behavior "PENB"	PENB-1	0.761	0.562	0.874	0.919
	PENB-2	0.844			
	PENB-3	0.761			
	PENB-4	0.786			
	PENB-5	0.783			
	PENB-6	0.739			
	PENB-7	0.779			
Employer Attractiveness "EMA"	EMA-1	0.922	0.693	0.888	0.905
	EMA-2	0.806			
	EMA-3	0.869			
	EMA-4	0.762			
	EMA-5	0.795			

Discriminant Validity

The discriminant validity test, a subtype of construct validity, was performed to evaluate how accurately a test measures the concept it was designed to measure and to verify that two tests, which should not be highly correlated, are indeed unrelated. In brief, this test demonstrates the distinctiveness of the constructs within the model, ensuring that each variable in the model is different from the others, thus confirming the discriminant validity of Kock's model (Kock, 2020). This was achieved using the cross-loading method and the Fornell-Larcker criterion test (Fornell & Larcker, 1981) (Table 2 and Figure 2).

Table 2. Fornell-Larcker criterion

Variables	GTFL	PENB	EMA
GTFL	**0.810**		
PENB	0.737	**0.791**	
EMA	0.796	0.750	**0.833**

*The square root of the Average Variance Extracted is shown by the bolded figures

Table 3. HTMT results

Variables	EMA	GTFL	PENB
EMA			
GTFL	0.770		
PENB	0.797	0.768	

According to the results in Table 2, each variable in the suggested model explains the variation of its constituent parts than the other factors, as per the guidelines of Fornell & Larcker (1981) and Hair et al. (2017). The discriminant validity of the model is therefore confirmed. Moreover, every item has a higher loading on its corresponding construct than on any variable construct in the suggested model of the study. Also, the model's discriminant validity, which was proposed and confirmed by Chin (1998), is highly supported by these findings. Additionally, Theheterotrait-monotrait ratio of correlations was less than the cut-off-point of 0.9, as stated and proposed by Henseler & Ringle (2015) (Table 3).

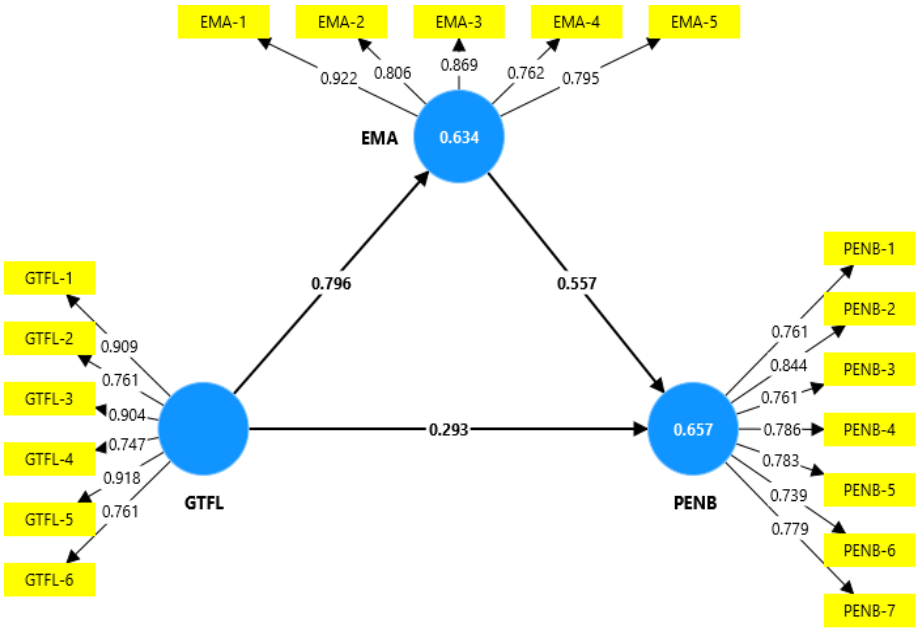


Figure 3. Measurement model

The Inner Model

Coefficient of determination (R^2):

In order to determine how effectively the statistical model predicts the outcome and interpret the proportion of variation in the dependent variable that is predicted by the statistical model. The predictive power of the suggested model was evaluated using the test "R^2", which is a value between 0 and 1. A value of 1 signifies a perfect match, while a value of 0 implies that the independent variable has no explanatory power. According to Chin's threshold, the results shown in Table 4 prove that the "IV" significantly influenced the "DV" (Chin, 1998), which was moderate.

Table 4. R^2 Test Results

Variable	R^2	Level
PENB	0.657	Moderate
EMA	0.634	Moderate

Effect size (f^2): The Effect size test "f2" was performed to determine the individual constructs power and impact of an "IV" on a "DV" in the proposed model. According to the recommendations of Cohen (1988), the results shown in Table 5 indicate that the effect sizes of the "IVs" on the "DVs" were ranging from small to large effect.

Table 5. Effect Size (f^2)

Variables	PENB	EMA
GTFL	0.292 (Medium)	1.731 (Large)
EMA	0.332 (Medium)	

Examination of "GoF": A goodness of fit test "GoF" was conducted across the measurement, structural, and overall model performance levels to ensure that the study's advised model fulfills the requirements for a global comprehensive fit measure model, as it was proposed and confirmed by Chin (2009):

$$GoF = \sqrt{R^2 x\ AVE}$$

Where "R^2" is the proportion of variance explained by the model, and its unit values between 0 and 1; "AVE" is the average variance explained by the latent variable for its indicators, and its unit values between 0 and 1; and "GoF" is the overall goodness of fit based on R^2 and AVE and its unit values between 0 and 1.

$$(0.657+0.634/2)\ X\ (0.655+0.562+0.693/3) = 0.4115$$
$$GoF = \sqrt{0.4115}$$
$$GoF = 0.641$$

According to the goodness of fit test result and the recommended point of reference provided by Wetzels et al. (2009), it is possible and conceivable to conclude that the GOF of the advised model is adequate enough to be considered appropriate to serve as a global PLS model.

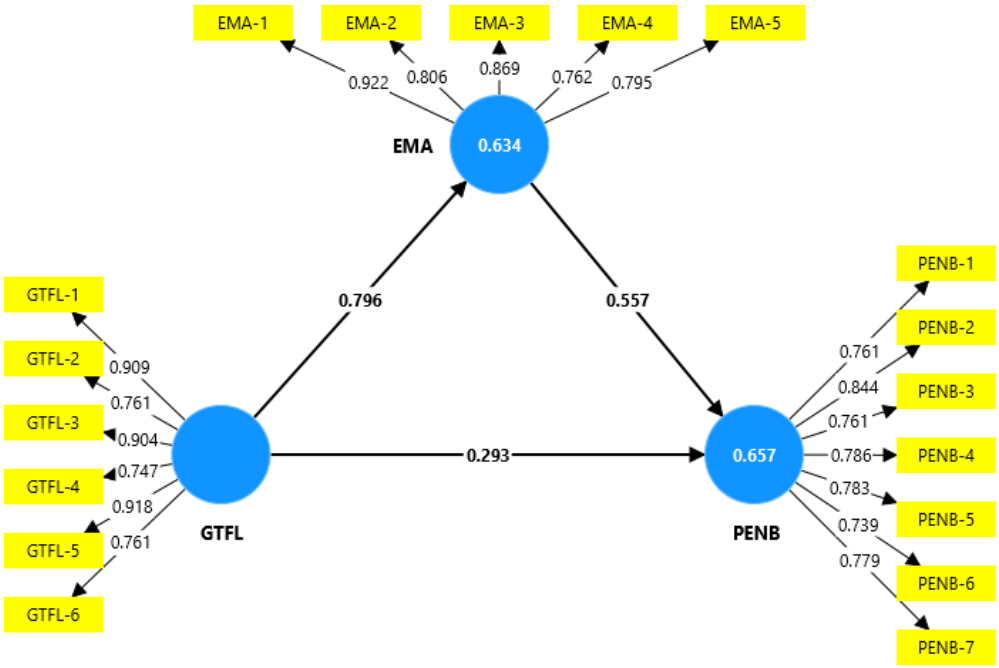


Figure 4. The final model

Examination of the Hypotheses

The effectiveness of the suggested theoretical model's compatibility with the primary data was evaluated using the path coefficient significance test. Tables 6 and 7 present the findings of each hypothesis examination.

Table 6. Direct path coefficient Significant at P** = 0.000

Hypothesis	B	σ	t-score(O/STDEV)	Sig.	Result
H-1: GTFL ->PENB	0.293	0.089	3.290	0.001	√
H-2: GTFL ->EMA	0.796	0.010	77.171	0.000	√**
H-3: EMA ->PENB	0.557	0.071	7.897	0.000	√**

The SEM results at tables 5&6 and the three direct proposed hypotheses (Figure 1). As demonstrated by Figure 4,"GTFL" has a direct positive and significant impact on "PENB" [Original sample score = 0.293; f^2 = 0.292; P-value = 0.001] and "EMA" [Original sample score = 0.796;f^2 = 1.731; P-value = 0.000]. Moreover, "EMA" positively and significantly influences "PENB" [Original sample score = 0.557; f^2 = 0.332; P-value = 0.000]. Therefore, all of the direct impacts hypothesis H1, H2 and H3 received empirical support (Figure 4).

Table 7. Indirect path coefficient Significant at P** = 0.000

Hypothesis	β	σ	t-score(O/STDEV)	Sig.	Result
H-4: GTFL ->EMA ->PENB	0.444	0.058	7.672	0.000	√**

As for the indirect relationship between the study variables, "EMA" shows a mediating impact on the relationship between "GTFL" and "PENB" [Original sample score = 0.444 and P-value = 0.000].The results revealed a significant mediating effect, leading to the acceptance of hypothesis H4 (Table 7 and Figure 5).

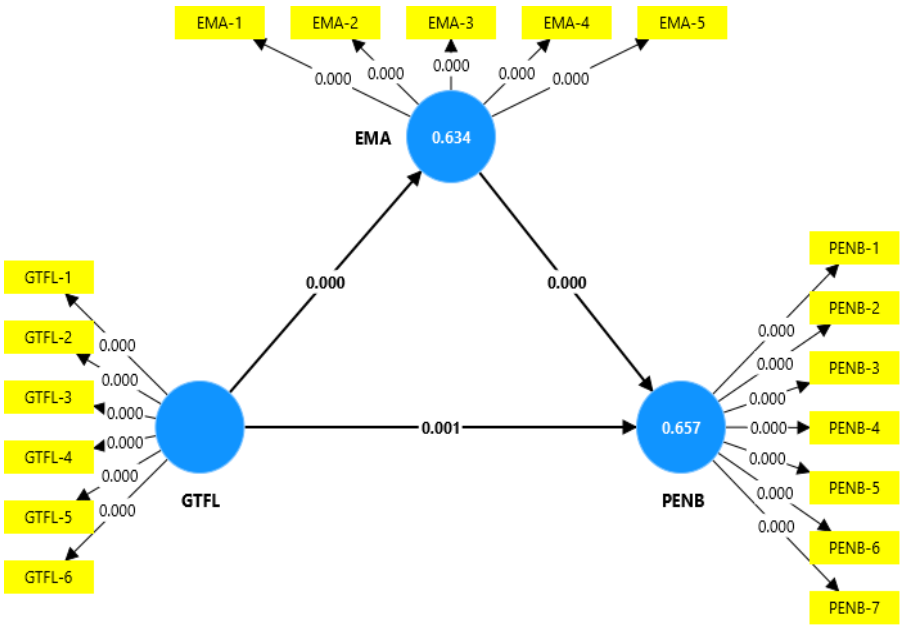


Figure 5. Significance of Path Coefficients

DISCUSSION AND IMPLICATIONS

This study aims to investigate how pro-environmental behavior (PENB) tourism sector is impacted by green transformational leadership (GTFL). The mediating function of employer attractiveness (EMA) in the link between "GTFL" and "PENB" is also examined. According to the results, "GTFL" significantly and favorably affects "PENB" among workers in the Egyptian tourism sector. This is largely consistent with the findings of Perez et al. (2023), who claimed that green transformational leadership qualities encourage organizational change and encourage staff members to take actions that lessen their environmental impact. Additionally, the results showed that "GTFL" significantly and favorably affects "EMA" among workers; this finding is in line with Florek-Paszkowska & Hoyos-Vallejo's (2023) assertion that green leadership improves organizational image and increases employers' appeal to environmentally conscious talent. The results also showed that "EMA" has a significant and positive impact on "PENB" among employees, which is in line with earlier research by Coelho et al. (2022), who contended that companies that prioritize sustainability draw in eco-aware workers who are more inclined to participate in PENB. Additionally, by highlighting the indirect impact of "GTFL" on "PENB" among employees through the partially intermediary role of "EMA," the results validate the mediating function of "EMA" between these variables.

Numerous findings from the study are important for both theoretical and practical implications within Egyptian tourism industry. This study extends existing theoretical frameworks by offering a nuanced perspective on the mediating role of Employer Attractiveness (EMA) in the relationship between Green Transformational Leadership (GTFL) and Pro-Environmental Behavior (PENB). While prior research (e.g., Coelho et al., 2022; Song et al., 2024) has explored EMA's mediating influence in various organizational contexts, this study advances the discussion by examining its specific application within the tourism sector, an industry with distinct sustainability challenges. By demonstrating that EMA not only mediates but also amplifies the impact of GTFL on PENB, this research highlights the mechanisms through which leadership strategies translate into sustained pro-environmental actions.

The findings suggest that organizations with strong environmental branding can further reinforce the leadership-behavior link, positioning EMA as a dynamic rather than passive mediator. This contributes to a deeper theoretical understanding of how leadership and employer perceptions interact to shape sustainable workplace behaviors, offering fresh insights beyond the conventional application of EMA in organizational studies.

These findings have significant managerial implications for the travel and tourism sector, highlighting the need for targeted strategies to foster a sustainable workplace culture. Decision-makers should integrate GTFL principles into leadership development programs, ensuring that managers receive specialized training in sustainability-driven leadership. Leaders should set measurable sustainability goals, actively reward eco-friendly behaviors, and embed green values into performance evaluation metrics to reinforce pro-environmental behavior (PENB). Moreover, enhancing employer attractiveness (EMA) requires concrete actions beyond value alignment.

Organizations should implement green HRM practices, such as sustainability-focused recruitment criteria, eco-conscious onboarding programs, and incentives for employees demonstrating environmental stewardship. Establishing green committees or employee-led sustainability initiatives can also strengthen engagement and encourage participatory decision-making in sustainability policies. Managers should prioritize the development of a structured framework for continuous sustainability training, ensure clear communication of environmental objectives, and provide tangible resources—such as energy-efficient infrastructure or waste reduction programs—to facilitate green behavior. By embedding sustainability into core business strategies and actively involving employees in shaping environmental policies, organizations can create a lasting impact on both workplace culture and industry-wide sustainability efforts.

CONCLUSION

The purpose of this study is to investigate how "GTFL" directly affects "PENB" in Egypt's tourism sector as well as how "EMA" indirectly affects "PENB." Data were received from 399 tour operators working in Egyptian tourism companies. Excel v.15-2013 and SPSS v.29-2022 were used to analyze descriptive data in order to look at the participants' demographics. Additionally, to evaluate the research hypotheses and look into the direct and indirect associations between variables, PLS-SEM v.4.1.0.9.2024 was used. "GTFL" has a good and considerable impact on "PENB" and "EMA" in Egypt's tourism business, according to the SEM results. Furthermore, the findings showed that "EMA" acted as a partial mediator in the relationship between "GTFL" and "PENB".

By recognizing and utilizing these mutually beneficial relationships, tourism decision-makers may create leadership development initiatives that prioritize green transformational practices and cultivate a sustainable culture that encourages staff members to embrace PENBs. By putting EMA first and making clear promises to uphold environmental principles, businesses may draw in and keep eco-aware workers while improving their reputation as green companies. Additionally, putting strategies into place that combine employee involvement in sustainability projects with leadership vision can increase the beneficial effects of GTFL on organizational performance and employee behaviors. These initiatives not only help Egyptian tourism sector become more sustainable, but they also put businesses in a position to satisfy the growing demand for environmentally responsible travel strategies worldwide.

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GEOHERITAGE TOURISM IN LENGGONG VALLEY, PERAK, MALAYSIA: LOCAL COMMUNITY INVOLVEMENT

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Abstract: Academic studies in the Lenggong Valley area have facilitated the careful recording of primary data on the location and current condition of each geoarchaeological site. This research has facilitated the sustainable empowerment of the heritage tourism sector by emphasising the principles of the Sustainable Development Goals (SDG)—leaving no one behind. Stakeholders plan to help local communities by participating in tourism activities to achieve this goal. Therefore, they conducted this study to document the involvement of local communities in tourism initiatives at geoarchaeological sites, particularly in Lenggong Valley, Perak, Malaysia. The research method used to enable the primary data to be recorded is to focus on survey and participation activities related to organised tourism programmes involving local communities. The recording of field activities allows primary data related to the location of the site to be mapped into a 2-dimensional map as well as being able to record the latest conditions and tourism facilities available at the heritage sites. In addition, by participating in activities, it has enabled data related to tourism activities involving the participation of the local community to be systematically recorded. In fact, by conducting observations through the organisation of geoguide workshops, it also allows data related to the involvement of stakeholders and the local community at the same time to be recorded for the purpose of creating certified geoguides at heritage sites in the Lenggong Valley area, Perak, Malaysia. The results indicate that certain segments of the local community in the Lenggong Valley have received training and are now actively participating in the role of certified tour guides. Additionally, some local communities serve as traditional food operators and provide homestay accommodations. This study indicates that the local community has played an active role in empowering the heritage tourism sector in the Lenggong Valley area. The study unequivocally demonstrates the successful alignment of tourism activities in the Lenggong Valley with the SDG principles, thereby safeguarding heritage tourism locations. Thus, this study has clearly documented the best actions of stakeholders and local communities, which have so far succeeded in directly involving the community in geotourism activities, especially in the Lenggong Valley area.

Keywords: Lenggong Valley, guided tour, tourism packages, local community, sustainability tourism

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INTRODUCTION

Academic studies conducted in the Lenggong Valley area (Figure 1) until now have revealed a total of 27 geosites, eight biosites, 18 cultural and heritage sites, and nine geoarchaeological sites within an area of only 2,068 km² (Talib et al., 2022). Generally, all of these mapped tourist sites are located in Mukim Durian Pipit, Temelong, Lenggong, and Kenering in the Hulu Perak district, Malaysia. Geographically, all the sites fall within the coordinates of 4.97-5.52° N (latitude) and 100.87-101.45° E (longitude) (Anonymous, 2021). The site has demonstrated significant scientific value, making it a potential iconic tourism product in the Hulu Perak district. Furthermore, UNESCO has recognized Lenggong Valley as a World Heritage site since 2012 (Jing Hang & Arifin, 2021) and as a National Geopark in 2021 (Sufian Suri, 2021; Talib, 2022), highlighting the uniqueness of its tourism products. The Geopark Promotion and Development Committee is currently working on a research dossier to nominate the Lenggong Valley as a UNESCO World Heritage site for the global geopark (UGGp) category in 2025, a move that could further propel its growth as a top tourist destination in Malaysia.

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Globally, all UGGp sites serve as sustainable tourism destinations (Lee & Jayakumar, 2021; Herrera-Franco et al., 2022), thereby fostering the development of an area's economic system. This allows the local community to have the opportunity to play an active role in the empowerment of the tourism sector, which provides economic strengthening benefits for the community (Ruban et al., 2023; Nguyen et al., 2024). Exploiting the privileges of mapped tourist locations can transform an area into a tourist destination, ultimately benefiting local residents (Niemczewska, 2020).

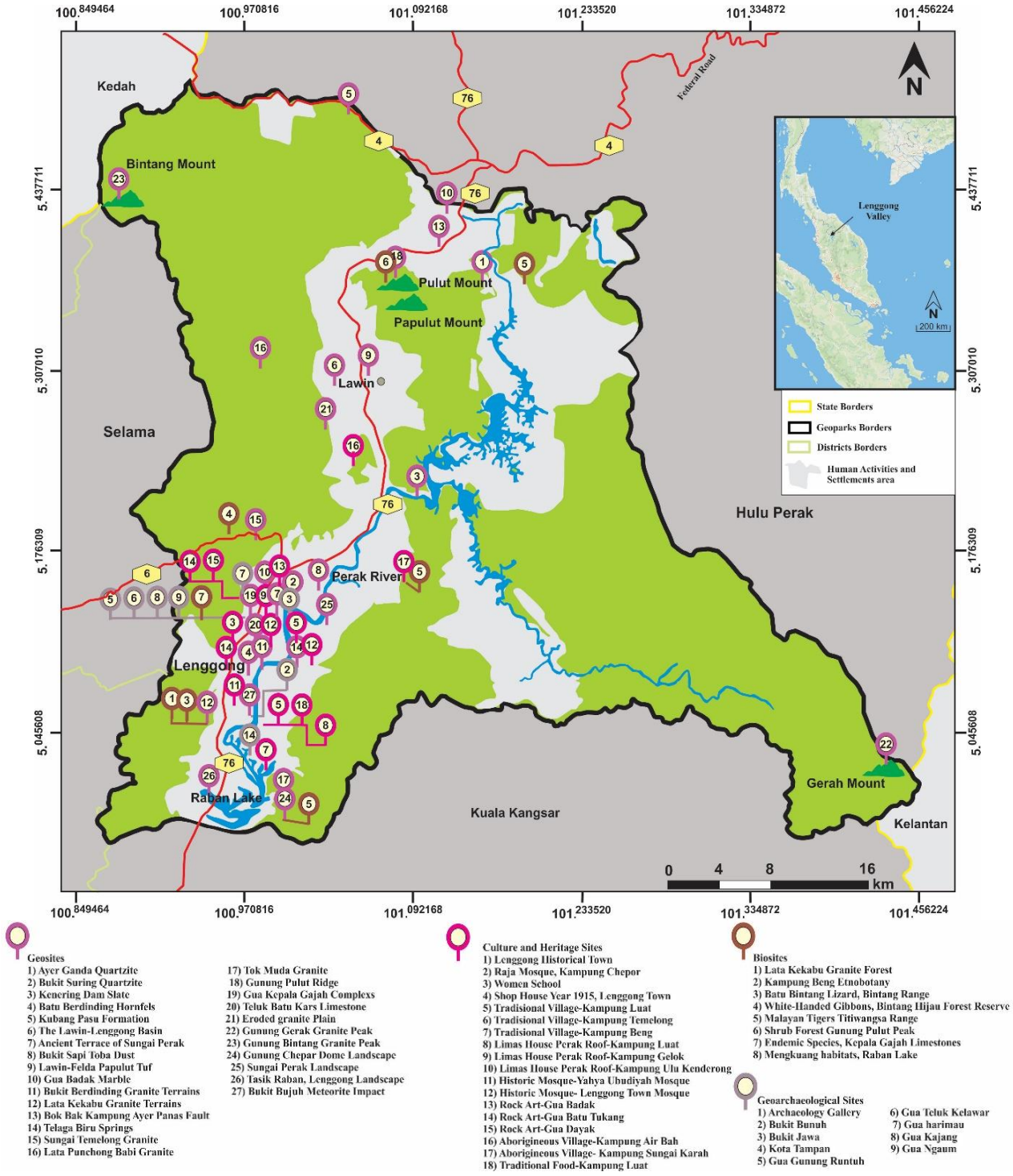


Figure 1. Location of geological, biological, geoarchaeological, cultural, and heritage tourism sites in Hulu Perak district (Source: authors based on data from Anonymous, 2021)

Studies in Malaysia's Sungai Batu Archaeological Complex (Abd Halim et al., 2023; Ali et al., 2023), Pelangi Cave (Abd Halim, 2022), Guar Kepah (Abd Halim et al., 2024), Tambun Cave (Goh et al., 2019), and Mount Mulu (Sanggin, 2009) show that the local community is involved in offering tourism packages. This shows that the heritage tourism sector has the potential to grow. Studies in the area have also found that the local community has played an important role in offering tourism packages and implementing them. The scenario has allowed the local community to capitalize by developing several heritage tourism packages that facilitate income generation.

HERITAGE TOURISM

In general, inheritance can be divided into two main groups: tangible and intangible heritage (Mohd Yusoff et al., 2011; Abd Halim et al., 2024a), and it can be inherited from generation to generation, consisting of cultural and natural forms found in a region, state, and country. So tangible heritage is a heritage that can be permanently seen and held, while intangible heritage is the opposite, namely that which is not real and cannot be seen as an object or held (Foo, 2019). Natural heritage encompasses the Earth's landscape and its fauna and flora.

All of these are national treasures that reflect the entire memory of the country and its inhabitants. This means that tangible cultural heritage covers cultural heritage sites, historical land sites, historical cities, monuments, cultural landscapes, sacred natural sites, mobile cultural heritage (artifacts), museums and galleries, handicrafts, documentary and digital heritage, cinematographic heritage, and underwater heritage. Intangible heritage includes oral traditions, language, festive events, rituals and beliefs, music and songs, performing arts, visual arts, traditional medical arts, literature, food and sports traditions, and traditional games. Natural heritage includes evidence of national parks, state parks, marine parks, forest reserves, wetlands, mangrove forests, wildlife reserves, mergastua reserves, aboriginal reserves, wildlife conservation centers, rivers, lakes, and seas (Foo, 2019).

Norhanim (2006), and Smith (2023), and assert that heritage tourism, while subjective and overly broad in its scope, typically concentrates on the remnants of a region's or nation's treasures. Therefore, many tourism terms are found to be related to heritage tourism, such as historical tourism, cultural tourism, and archaeological tourism for cultural tourism, while geological and ecological tourism are for nature tourism.

The tourism sector can expand and attract tourists from various regions and countries to heritage tourism sites for exciting visits, thanks to the diversity of heritage site classifications (Alister & Wall, 1982; Abdullah, 2014; Fletcher et al., 2017). Therefore, heritage tourism allows the movement of people to areas that have evidence of fascinating and unique cultural and natural heritage (Prentice, 1993; Bitusikova, 2021). The purpose of travel is to gain experience with the authenticity of places, artifacts, and activities that represent the stories and societies of the past and present in an area.

When tourism activities occur, they enable the recognition of a nation's heritage (Hyasat, 2023), serve as a catalyst for economic growth, and ultimately serve as a powerful force for its preservation under the World Heritage concept. The history of the tourism industry reveals that it has undergone a significant metamorphosis. The industrial revolution in the 19th century AD, initially perceived as a threat to the past, gave way to the 20th century AD, which gained prominence and profitability on a large scale (Walsh, 1992; Ali, 2022). In the 21st century, it has become a trend for tourists to engage with their surroundings, origins, and past. Tourists are willing to move across the borders of a country to get information about the greatness and credibility of a nation in the past through the evidence that still exists.

Based on this trend, Lowenthal (1985) stated that heritage tourism is not historical tourism but more than that. Heritage tourism can provide exposure to the past in the present, which is universal knowledge of natural phenomena and humanity. Because of its importance, Europe has taken advantage of this heritage tourism industry to the fullest and has become their countries' economic resource (Walsh, 1992; Ashworth & Larkham, 1994; Ali, 2022). UNESCO established the conservation and preservation of heritage sites in response to global needs. To achieve this goal, UNESCO introduced the World Heritage Sites program. UNESCO created several programs, including Man and Biosphere (MAB) and International Geoscience and Geoparks (IGGp) under the Natural Sciences division for natural heritage and the World Heritage Site Program (WHS) under the Culture division for cultural heritage (Du & Girault, 2018). These three programs facilitate the declaration of UNESCO World Heritage sites, including Cat Ba, Vietnam (MAB), Geopark Langkawi, Malaysia (IGGp), and Borobudur, Indonesia (WHS).

The declared sites, in addition to their conservation and preservation, are the result of a successful and sustainable heritage tourism industry that prioritizes community involvement in its tourism development.

Local communities in Malaysia actively participate in heritage sites, as evidenced by the Heritage Site at Gua Pelangi (Abd Halim et al., 2022), the Sungai Batu Archaeological Complex (Ali et al., 2023; Abd Halim et al., 2024b), and Guar Kepah (Abd Halim et al., 2024c). Local communities in Gua Pelangi (Abd Halim et al., 2022) and the Kuala Muda district, Kedah (Ali, 2022) are primarily involved as tourist guides, while they also play a role as homestay operators and traditional food providers. This shows that there is a need to involve the local community in the process of strengthening the heritage tourism sector in Malaysia. Prioritizing the community's role in tourism for sustainability purposes allows the community to feel less marginalized and more valued.

Globally, there is a pressing need for community involvement in the tourism sector to prevent marginalization of this group in the development process. Researchers White & Adu-Ampong (2024) conducted research in Crete, Greek Island; Panayidou et al. (2024) in Cyprus; Melly (2024) in Sligo, Ireland; Pangani, Tanzania (Chami & Mjema, 2024); Khadijah et al. (2024) in Garut Regency, West Java; Sutrisno et al. (2024) in Bantar Karet Village in Nanggung District, Bogor Regency; Sumarmi et al. (2024) in Bedul, Banyuwangi, Indonesia; Choosuk et al. (2024) in Libong Island, Thailand, Mekong Delta Region, Vietnam (Nguyen et al., (2024). This demonstrates that cannot ignore the role of communities in heritage sites and need a mechanism to ensure their active participation in the empowerment of the tourism sector.

ICONIC GEOTOURISM SITE

Society generally recognizes an iconic product for its factual authenticity (Woodside et al., 2007; Tang et al., 2009).

This product often provides a very positive image among tourists and the local community, as it is a symbol of local pride (Jenkins, 2003; Holt, 2004). According to Holt (2004), iconic products can be a major source of sales for a single locality that has them. According to Talib et al. (2022), scientific research in the Lenggong Valley area has established the

validity of its main iconic products, which include geological, biological, archaeological, cultural, and heritage evidence. Geology and biology are in the category of natural heritage tourism; archaeology is in the category of archaeological heritage tourism; and culture and heritage are in the category of cultural natural heritage.

This is because the Lenggong Valley itself consists of limestone forests, lowland dipterocarp forests, hill dipterocarp forests, mountain forests, dusk areas, and secondary forests (Figure 2). However, it is the limestone hills that contain a large number of rare and endemic species of flora. Additionally, researchers have recorded five [5] species of rare limestone flora in the Lenggong Valley. The microendemic land snails Sinoennea lenggongensis (*Family: Diapheridae*) and *Diplomatina lenggongensis* (*Family: LANDSNAILS-Diplommatinidae*) and the Lenggong Bent-toed Gecko (*Cyrtodactylus lenggongensis, Fam. Gekkonidae*) are some of the animals that live in this area (Foon et al., 2017; Talib et al., 2022).

Lenggong's mountain forests and limestone forests serve as one of the 50 primary habitats for the Sumatran serow (Capricornis sumatraensis, Fam. Bovidae), which is the only wild goat species in Malaysia (*subfamily Craprinae*). The lower-level mountain forests cover the Bintang and Titiwangsa ranges. The forests here are characterized by medium-tall trees and emergent trees, mainly of the *Dipterocarpaceae* family. Among the rare mountain animals are the wild goat and the mountain peacock-pheasant (*Polyplectron inopinatum*) (Talib et al., 2022).

Additionally, Paleolithic, Neolithic, and metal cultures have left evidence of prehistoric settlement in the Lenggong Valley area. The evidence of this culture can be traced back 1.83 million years (Figure 3) (Abdullah et al., 2020) to the open area surrounding the ancient Perak River terraces (Figure 4) and further back to the limestone caves (Figure 5) approximately 14,000 years ago (Goh, 2008: 2014). All of this evidence shows the paleoenvironmental uniqueness of the Lenggong Valley, which can be exploited to become a successful heritage tourism site. Nowadays, the concept of tourism emphasizes the principle of "leave no one behind" (Butcher et al., 2021; Mensah et al., 2022; Gupta & Vegelin, 2023), which emphasizes the involvement of the local community. Consequently, the heritage tourism sector development program in the Lenggong Valley also emphasizes the application of methodologies to preserve tourism.



Figure 2. The Lenggong Valley offers a stunning view of the biological evidence surrounding Pulut Mount (Source: authors)



Figure 3. Evidence of meteorite impact on Bukit Bunuh (Source: authors based on data from Kiu et al., 2013; Anonymous, 2021)



Figure 4. The presence of river gravel provides evidence of the existence of ancient Perak River terraces at Bukit Jawa Site in the Lenggong Valley (Source: authors)

(a)   (b)

Figure 5. Evidence of limestone cave environment occupancy conducted by archaeological studies (a) and early community cultures found at the site (b) (Source: Anonymous, 2021)

METHODOLOGY

The investigation was carried out using a variety of information-gathering techniques. The first approach involved surveying the position and accessibility of famous tourist destinations in the Lenggong Valley. The survey procedure will enable the implementation of tour packages by documenting the locations and current conditions of the tourist destinations.

To collect primary data on community involvement in the historical tourism industry in the Lenggong Valley, the second approach entails holding a workshop on tour guide empowerment and participating in community-organized tourist events (Figure 6).

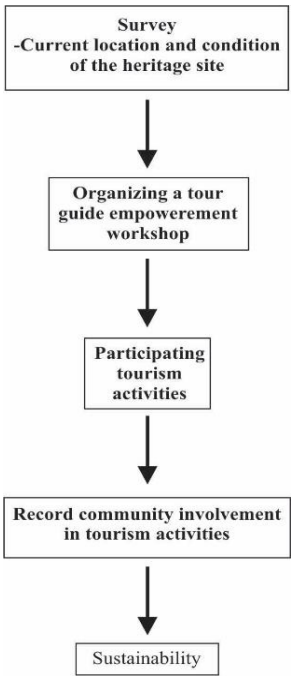


Figure 6. Methodology used to obtain primary data were used to complete the study (Source: authors)

RESULT

Survey activities

Survey activities conducted by Mat Stafa et al. (2018) have recorded that the heritage site is in excellent condition and has access routes to reach it. The most recent survey activity also confirms the heritage site's continued good condition, demonstrating that the process of enhancing heritage tourism in the Lenggong Valley has successfully preserved tourism areas (Figure 7). The path to the tourist destination is still well-maintained and accessible by motorcycle, four-wheel drive, or walking. In fact, the Heritage Site area's information panel is in excellent shape, clear and in good condition (Figure 8). This helps visitors learn about a place's benefits.

(a)   (b)

Figure 7. A well-preserved heritage site in Gua Teluk Kelawar (a) dan Bukit Bunuh (b) in the Lenggong Valley (Source: authors)



Figure 8. The information panel at the heritage site (a,b,c, d) was found to be in good condition (Source: authors)

TOURISM ACTIVITIES: LOCAL COMMUNITY INVOLVEMENT

Nowadays, the tourist sector has drastically transformed from solely providing satisfaction and plea sure during travel to becoming a profitable and income-generating sector (Nagarjuna, 2015). The current situation has incited numerous parties to become involved. The development of tourism activities, in particular, can have a positive impact on changing community practices and lifestyles (Ashley & Roe, 1998) if the local community is able to exploit the opportunities available to engage in tourism activities either as a tour guide (Bayram, 2020; Malelak et al., 2022) or provide facilities for the empowerment of the tourism sector (Giampiccoli & Mnguni, 2016; Ismail et al., 2016; Kimiaga & Kihima, 2018; Mulley et al., 2018; Pilis et al., 2022).

The Ministry of Energy and Natural Resources and the Department of Minerals and Geosciences Malaysia organize the Reskill & Upskill program for the basic and advanced course of Jurupandu@Geoguide Lenggong Geopark 2022 (Figure 9), aiming to prepare the local community as tour guides and equip them with knowledge in the heritage tourism sector in the Lenggong Valley. After that, the Lenggong Tourism Unit, a division of the Lenggong District Council, oversees all geoguides to ensure constant performance monitoring and the provision of necessary advice.



Figure 9. Organization of geoguide workshop (a) attended by the local community (b) aimed at strengthening the heritage tourism sector in the area (Source: authors)

As a result, the organization of such a program allows the local community to play an active role in the tourism sector. This will enable the implementation of the Community-Based Tourism Entrepreneurship (CBTE) program. The program serves as a proactive measure to foster local community businesses by transforming the socio-economic lifestyle of the community (Hassan et al., 2021). Through the program, the community in Lenggong Valley has produced and marketed traditional food products of Lenggong Valley, highlighting traditional foods and empowering heritage tourism in the area. Thus, the community in Lenggong Valley has produced and marketed traditional food products like Kebebe, Sambal Serai, and Ikan Pindang Lenggong under the brand name 'Lenggong Delicious,' demonstrating the success of this organized program (Hassan et al., 2021). In addition, Indigenous communities in Kampung Air Bah are also involved in ecotourism activities in the forests around their villages. Despite the limited involvement of the Kampung Air Bah community in tourism at present, several plans are in place to expand their role in the future. This involves enhancing the local community's role as tour guides, gallery administrators, handicraft shops, and homestay operators, thereby bolstering the local economy in the villages (Mohamed, 2020).

TOURISM PACKAGES AND ITINERARY

To boost the heritage tourism sector in the Lenggong Valley Area, Tourism Malaysia also plays a major role in producing daily tour packages-up to 3-day, 2-night tour packages in this area (Figure 10) (Tourism Malaysia, 2023). The aim is to promote archaeological heritage as well as Lenggong Geopark, which is recognized as the second national geopark in Perak after Kinta Valley Geopark. This means that until now there have been a total of 48 tour packages in the Lenggong Valley that offer the experience of visiting archaeological sites, hill climbing, cave exploration, boat cruises, fishing, and camping (Anonymous, 2023). According to Anonymous (2023), the tour packages offered by Tourism Malaysia include the Lenggong Geopark and Ecotourism package, Deer Grill & Fun Trip @ Lenggong package, Scientific Tour Package @ Lenggong, Lenggong Heritage Tour Package, Discover Historical & Cultural Geo Lenggong package, Lenggong "Cave Tour & Durian Meal" package, and Amazon Paddling @ Lenggong Mini package. This enables tourists to tailor their tour experience to their personal tastes and requirements. The most significant aspect of Tourism Malaysia's tour package is the inclusion of local community members as tour guides and tourism industry players.



Figure 10. Tourism Malaysia has launched tour packages in the Lenggong Valley, involving the local community (Source: authors based on data from Anonymous, 2023)



Figure 11. Guided tour to Bukit Bunuh to see evidence of meteorite impact (Source: authors)

In addition to Tourism Malaysia, the local community, which is now under the auspices of the Geoguide Lenggong Geopark, also offers tour packages directly to tourists. The package offers a daily tour lasting up to 3 days and 2 nights, focusing on a visit to the archaeological sites of Bukit Bunuh (Figure 11) and Bukit Jawa (Figure 12) to explore the meteorite impact area and stone tool-making workshop from the Paleolithic era. In addition, the local community also held a visit program to Bukit Sapi to see evidence of the remains of the eruption of volcanic dust in Lake Toba (Figure 13), Kajang Cave, Teluk Kelawar Cave, Ngaum Cave, Harimau Cave, and Badak Cave (Figure 14), which revealed evidence of settlements and burial areas dating from the Paleolithic to Neolithic periods in the Valley of Lenggong. To maximize the experience of visiting the Lenggong Valley area, a visit to the Lenggong Valley Archaeological Museum is also carried out (Figure 15).





Figure 12. Guided tours are also conducted to the Bukit Jawa site to see evidence of *in situ* stone tool making workshops (Source: authors)
Figure 13. A visit tour to Bukit Sapi to see evidence of the eruption of Lake Toba volcano dust (Source: authors)

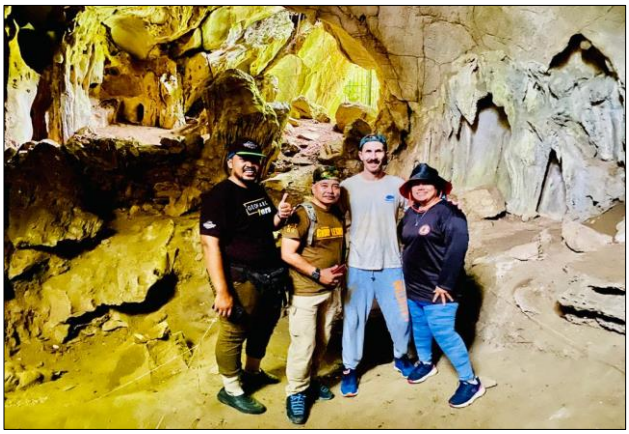




Figure 14. Tourists also visit the cave area to learn about the evidence of settlements and burials from the Paleolithic to Neolithic periods (Source: authors)





Figure 15. The visit program to the Lenggong Valley Archaeological Museum is also carried out to expose tourists to archaeological studies in this area (Source: authors)

A visit to the museum area will concentrate on the archaeological evidence discovered and researched in this area, which includes human skeletons, stone tools, burial materials, pottery, and iron tools. A visit to this particular museum can enhance tourists' understanding and help formulate the historiography of this area. Additionally, the program engaged in activities such as making stone tools (Figure 16) and searching for snails in the Temelong River, specifically Brotia costula and Brotia spinosa (Figure 17). Participating in such activities undoubtedly contributes to the addition of information and knowledge about the early history of the area. Such a program can stimulate the heritage tourism industry in the Lenggong Valley area and ensure its sustainable preservation.



Figure 16. Stone tool making experiments using river stone as a raw material are also organized for interested tourists





Figure 17. River snail hunting activities are carried out to maximize the experience of tourist visits to the Lenggong Valley (Source: authors)

DISCUSSION

Recent trends in tourism around the world have found reconstructing nature to be among the elements that are focused on tourism development. This is because aspects that include geographical features such as national parks, protected areas, waterfalls, lakes, dams, beaches, caves and formations, interesting panoramas, and areas with natural beauty, as well as areas that have evidence of the culture of past communities, have been used as the main capital in the empowerment of the tourism sector (Ahmad et al., 2013). This is due to the fact that tourism, which is rooted in natural and cultural heritage assets, not only aids in the preservation and conservation of a sustainable environment but also fosters the strengthening of individual identity through the positive values found in these tourist areas.

By focusing on this matter, Malaysia began to strengthen its heritage tourism sector, and the local community in the Lenggong Valley also seized the opportunity to fully participate in tourism activities. This is because studies on UNESCO World Heritage sites, including those that are world heritage sites (WHS), UNESCO Global Geoparks (UGGp), or Man and Biosphere (MAB), have shown that they have helped the tourism industry grow (Hosseini et al., 2021; Zeng & Wang, 2022; Bertacchini et al., 2024), and they can also help local communities strengthen their economies (Agarwal et al., 2023; Alamineh et al., 2023; Riyanto et al., 2023). Therefore, the Lenggong Valley area developed several tour packages that featured visits to unique geological, biological, and geoarcheological natural heritage tourism sites, which have become iconic products.

Based on the successful management of UNESCO World Heritage sites in the heritage tourism sector, the local community, stakeholders, and NGOs have collaborated to develop the heritage tourism sector by offering a variety of special tourism packages. The heritage tourism package offerings in the Lenggong Valley prioritize sharing the wealth of natural and cultural heritage treasures with a diverse range of tourists while also highlighting the sustainability of tourism locations.

Furthermore, the sustainable success of knowledge heritage tourism hinges on the full involvement of the community, as demonstrated by the experience and management of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) on the UNESCO Global Geopark (UGGp), World Heritage Site (WHS), and Man and Biosphere (MAB) sites. This aligns with the country's community policy, which prioritizes eight main thrusts, including the values of entrepreneurship, social business, and social services (Ali, 2022). These thrusts necessitate direct community involvement in the tourism sector. The policy has facilitated social entrepreneurship and strengthened social services that have a direct connection to tourism. This enables the community to actively participate in roles such as tour guide, craft entrepreneur, or homestay, in addition to their involvement in the traditional food industry, which in turn shapes the opinions of the local community (Ali, 2022).

Even in the Lenggong Valley itself, there is also a group of local communities that play an active role as traditional food entrepreneurs (Hassan et al., 2021; Daeng Jamal et al., 2023; Abdul Raji et al., 2024) capable of promoting heritage tourism in the Lenggong Valley at its best. Even the survey activities carried out also revealed that in the Lenggong Valley area, there are also accommodation services such as Taek Raban Resort and Lenggong Rest House, as well as homestays such as Luat Homestay, D'Tasek Lenggong Homestay, KTC Homestay Lenggong, and many others that are close to heritage sites, which shows that the community is ready to receive visits from tourists. Additionally, this area boasts robust health facilities capable of handling any disaster or accident that may arise during tourism activities. This demonstrates that the Lenggong Valley and its communities are in a phase of sustainable development, enabling the effective empowerment of the heritage tourism sector.

CONCLUSION

The Lenggong Valley area's academic studies have made it possible to systematically record a number of geological, biological, geoarcheological, and cultural heritage tourism sites. Collaboration with stakeholders has resulted in the creation of several heritage tourism packages. So far, there have been 48 tour packages offered under Tourism Malaysia (2023) in addition to side packages undertaken by the local community. This bolsters the heritage tourism sector, drawing tourists to the Hulu Perak region and fostering the economic growth of the local population.

Limitations of the study for futere study

The Lenggong Valley area's heritage tourism study does not prioritize the involvement of stakeholders, NGOs, and the local community in the implementation of heritage tourism. This needs to be carried out as a comprehensive study along with accurate data related to the success of its implementation to measure the success of heritage tourism promotion offered.

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GEOGRAPHICAL INDICATIONS AS ATTRACTORS FOR RURAL TOURISM: INSIGHTS FROM THE COUNTRYSIDE OF SERBIA

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Abstract: Geographical indications (GIs) play a critical role in preserving authenticity and tradition in production, as products with GIs often carry rich histories and are associated with specific production methods characteristic of particular regions. This study investigates tourists' perceptions of geographical indications and their role in enhancing rural tourism and fostering economic development in Serbia, a non-EU country seeking sustainable development. The research explores how GIs contribute to tourism by elevating the value of local agricultural products and empowering rural communities. The research was conducted from May to August 2024 in nine carefully selected agritourism households across Serbia. The questionnaire used in this study consists of 25 closed-ended statements across five factors: Perception of product quality (PPQ), Authenticity and tradition (AT), Economic impact (EI), Tourist experience (TE), and GIs as attractors. The highest mean value (m) in the study was observed for the statement AT5 (4.88), indicating that respondents strongly believe that products with geographical indications help in understanding the cultural and historical context of the product. This statement also had the highest factor loading (λ) of 0.978, demonstrating its significant contribution to the authenticity and tradition construct. Furthermore, in Cluster analysis data was divided in two clusters. The respondents in Cluster 1 have fewer positive attitudes toward the economic impact and attractiveness of geographical indications, while they generally hold neutral or slightly positive views on other aspects. The respondents in Cluster 2 perceive products with geographical indications as particularly attractive, despite having weaker attitudes toward other variables. Our approach explores how perceptions of

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authenticity and cultural value of GI-labeled products impact tourist experiences, satisfaction, and their willingness to recommend or revisit destinations. The findings suggest that tourists associate GIs with high quality, authenticity, and cultural heritage, which significantly impacts their decision-making process and satisfaction levels. Furthermore, the study reveals that tourists are willing to pay more for products labelled with GIs, which in turn boosts the local economy and helps preserve cultural traditions. Finally, Geographical indications not only differentiate products in the global market but also contribute to building recognizable brands that can significantly enhance the tourist appeal of certain regions.

Keywords: GIS, agriculture, tourism, sustainability, Serbia, perception of product quality, authenticity and tradition, economic impact, tourist experience

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INTRODUCTION

In the revision of European Union legislation on geographical indications (GIs), the focus is on enhancing the legal framework to better protect and promote products with specific geographical origins. For that purpose, the EU recently adopted Regulation 2024/1143, which repeals an existing agri-food GI regulation and amends provisions relating to wine GIs in Regulation 1308/2013 (the Common Market Organization Regulation), 2019/787 (The Spirit Drinks Regulation), and 2019/1753 (on the Geneva Act of the Lisbon Agreement). This revision, as part of the broader "Farm to Fork" strategy within the European Green Deal, aims to strengthen the sustainability and resilience of rural communities. These reforms, according to the European Parliament, will further strengthen the position of European agricultural products in the global market, providing them with better end user access and greater competitive edge. According to the World Intellectual Property Organization (WIPO) (WIPO, 2021), in 2017, products protected by GIs and the Traditional Specialties Guaranteed (TSG) scheme accounted for 7% of total sales in the EU-28, with a value of €77.15 billion - 49% from wines, 43% from agri-food products, and 8% from spirits. Agri-food and drink products alone generated €74.76 billion in sales. GIs significantly contribute to tourism and local economic development in rural areas.

Crescenzi et al. (2023) highlight their positive impact on Foreign Direct Investment (FDI) in the agri-food sector, which promotes job creation. Pamukcu et al. (2021) emphasize that GIs are particularly influential in gastronomic tourism, contributing up to 60% of the sector's growth. De Simone et al. (2023) show that combining GIs with World Heritage status increases tourist visits, overnight stays, and spending. Vandecandelaere et al. (2020) stress that GIs help primary producers achieve higher value and market access, boosting population growth and economic diversification in rural areas (Poetschki et al., 2021; Bellassen et al., 2022; Chernyshev et al., 2023; Li et al., 2024).

However, GIs' environmental effects differ between the Global North and South, posing sustainability challenges (Zattoni & Cazella, 2021; Stojanović et al., 2024). Santeramo & Lamonaca (2020) note that geographical labeling is particularly significant for high-priced products like wine. Geographical indications are associated with high-quality products, as origin labels ensure specific production processes and standards (Gajić et al., 2023). Quiñones Ruiz et al. (2018) observed that GIs in the European Union continuously adapt to market demands and legislative changes, maintaining high-quality standards and consumer trust. Perito et al. (2017) found that GIs in supply chains, particularly in the sheep and goat meat sector, require tailored management and organizational models to ensure quality.

H1: There is a positive impact of the perceived quality of products with geographical indications on tourists' decisions to visit different countryside destinations.

Geographical indications play a critical role in preserving authenticity and tradition in production, as products with GIs often carry rich histories and are associated with specific production methods characteristic of particular regions (Tripathi & Vedula, 2022; Pospelova, 2022; Ma et al., 2024). The preservation of these traditional methods and practices through geographical indications contributes not only to the safeguarding of cultural identity but also to strengthening the sense of community and identity among the inhabitants of these regions. Consequently, these products become symbols of cultural heritage, further fostering the connection of local communities with their tradition and authenticity (Nesterchuk et al., 2020; Galkin & Pospelova, 2021; Beck & Ferasso, 2023). Biénabe & Marie-Vivien (2017) emphasize that the institutionalization of geographical indications in Global South countries, such as Basmati rice and Rooibos, offers important lessons on the challenges and opportunities in integrating local products into the global market while preserving their authenticity.

H2: The authenticity and tradition associated with products bearing geographical indications positively impact the tourist experience.

Geographical indications (GIs) play a vital role in driving economic growth in local communities by enabling producers to command higher prices, thus directly enhancing regional economic conditions (Wang, 2018; Mazé, 2023; Fournier et al., 2018; Röös et al., 2018). GIs add value to agricultural and food products by emphasizing their authenticity and quality, which improves their recognition and competitiveness in global markets (Yin et al., 2024). Belletti et al. (2015) note that protecting GIs, particularly in sectors like olive oil in the European Union, not only promotes environmental conservation but also ties sustainable practices to economic benefits for local producers.

Marie-Vivien & Biénabe provide a comprehensive review of the role of the state in protecting geographical indications worldwide, highlighting the importance of legal frameworks and promotion in achieving economic growth. This synergy between ecological and economic factors allows producers to capitalize on the authenticity of their products while contributing to community sustainability and development. De Filippis et al. (2022) show that GIs also enhance international trade, especially in the wine sector and products with protected geographical indications (PGIs), by providing protection and increasing competitiveness for lesser-known products (Agostino & Trivieri, 2014; Agostino

& Trivieri, 2016; Borghini et al., 2024). Larger producer groups and longer production traditions are often associated with higher prices and better margins, further driving the economic success of products with GIs.

H3: The perception of the economic impact of products with geographical indications significantly contributes to tourists' willingness to pay a higher price for these products.

Tourists seek authentic experiences that connect them with local culture, and geographical indications (GIs) play a key role in facilitating this (Galkin, 2021; Flinzberger et al., 2022; Cheng, 2024). GIs allow tourists to enjoy products with genuine origins, enhancing the appeal of destinations known for these offerings (Dokuzlu, 2016; Falasco et al., 2024). Products like local food and beverages often motivate visits and increase both tourist numbers and spending (Sutiadiningsih et al., 2023). Zhang et al. (2023) highlight GIs' role in boosting agricultural exports and reducing socio-economic disparities between urban and rural areas, promoting rural development and attracting more tourists. Research by Lee et al. (2019) shows that GIs are associated with higher product quality and trust, leading to increased sales, including online. This also enhances tourists' satisfaction by offering authentic, recognizable products. Castro et al. (2021) emphasize that GIs are a vital branding tool, particularly in the wine sector in Brazil's Rio Grande do Sul.

H4: The tourist experience in the countryside with geographical indications positively impacts overall tourist satisfaction and their willingness to revisit these areas.

This study aims to examine tourists' perceptions of the role of geographical indications (GIs) in fostering rural tourism and economic development in Serbia, a non-EU country in transition and dedicated to sustainable development. The research focuses on how GIs can enhance the attractiveness of rural tourism destinations, increase the value of local agricultural products, and strengthen the economic stability of rural communities. Existing research on geographical indications (GIs) in rural tourism provides valuable insights into the potential benefits these indications bring, particularly in terms of promoting local economic development and preserving cultural heritage. However, there are certain limitations in current studies that should be considered when assessing their findings. Most research focuses on EU countries, where legal protection and institutional support for geographical indications are well established, while applying these findings to countries with transitional economies, such as Serbia, remains challenging. Belletti et al. (2015) emphasize the importance of adapting methodological approaches and institutional frameworks to ensure the effectiveness of GIs in diverse economic contexts.

Most studies use relatively small samples, which may limit the statistical power and generalizability of results, as highlighted by Tregear et al. (2020). They point to the need to expand samples to gain a more accurate understanding of the impact of GIs on tourist perceptions and willingness to purchase products with these labels. Moreover, reliance on respondents' perceptual data may limit the objectivity of conclusions. García-Hernández et al. (2022) suggest including quantitative indicators, such as revenue data from the sale of GI-labeled products, to provide a clearer view of the direct link between these indications and the economic growth and sustainability of local communities.

The ecological aspect of the impact of geographical indications is another area that requires greater attention, given that current research primarily emphasizes the socio-cultural perspective. Further research is needed to understand the long-term effects of geographical indications on rural tourism and local communities.

Unlike most existing studies that focus on EU countries with established GI legal protections, this study explores the unique challenges and opportunities in implementing GIs in transition countries like Serbia. Through analyzing tourists' perspectives, the study provides new insights into the potential of GIs as a tool to boost tourism and local agriculture, further integrating Serbia into European and global markets. The distinct value of this study lies in its emphasis on tourists' viewpoints, which play a crucial role in the success of GIs as promoters of local products and destinations. As one of the first studies to systematically address the role of GIs in Serbia, this research highlights their potential for sustainable development and economic empowerment in rural areas beyond the EU framework. Additionally, it offers practical recommendations for policymakers and producers to enhance economic sustainability and promote Serbian products on the international market, contributing to the global understanding of the value of GIs for developing countries.

Nizam & Tatari (2022) investigated how geographical indications (GIs) can be used to revitalize rural areas through territorial distinctiveness in Turkey. Their research indicates that GIs have the potential to contribute to the economic development of local communities by enhancing the value and recognition of regional products. They particularly emphasized the importance of preserving cultural and traditional aspects through the use of GIs, which encourages tourism interest in rural areas and strengthens local identity. Similar to our study, Nizam & Tatari (2022) concluded that the effectiveness of geographical indications is conditioned by regional characteristics and the support they receive from local and national institutions. In his work, Saputra (2020) analyzed the development of creative industries as regional leaders in national tourism efforts based on geographical indications (GIs). His research highlights that creative industries can significantly contribute to tourism development and regional recognition by protecting and promoting products with GIs.

Saputra emphasizes that geographical indications enable regions to leverage their cultural resources and authenticity in promoting tourism products, leading to strengthened local economies and attracting visitors. The conclusions of his research suggest that effective implementation of GIs requires an integrated strategy involving the active role of local communities, government, and the industrial sector, aligning with the findings of our research. Fu et al. (2024) examined Chinese consumer preferences for beef labeled with geographical indications (GIs) compared to other product attributes. Their research shows that GIs can significantly influence consumer decisions, as they further emphasize product quality and authenticity. This complements our research on the role of geographical indications in enhancing the value of local products, indicating that GIs not only strengthen market competitiveness but also contribute to the recognition and sustainable development of local communities. Dogan & Adanacioglu (2024) studied the factors influencing Turkish

farmers' decisions to produce dry beans with geographical indications (GIs). Their research highlights the crucial role of economic and social incentives in adopting geographical indications, especially in the context of local agriculture.

These findings are connected to our research, as they indicate how GIs can contribute to greater economic prosperity and the sustainable development of rural communities by increasing the value of local products and their market recognition. Vaquero et al. (2024) investigated the impact of geographical indications (GIs) on the quality of imported products, analyzing how GIs can serve as a tool for differentiation and quality enhancement. Their findings are relevant to our research as they show how GIs not only improve the perception of product quality but can also play a crucial role in the competitiveness of local producers in the international market, further promoting the development of local economies.

METHODOLOGY

1. Procedure and sample

The research was conducted from May to August 2024 in nine carefully selected agritourism households across Serbia, including the municipalities of Šabac, Zlatibor, Kopaonik, Kladovo, Bogatić, and Golubac (Figure 1).

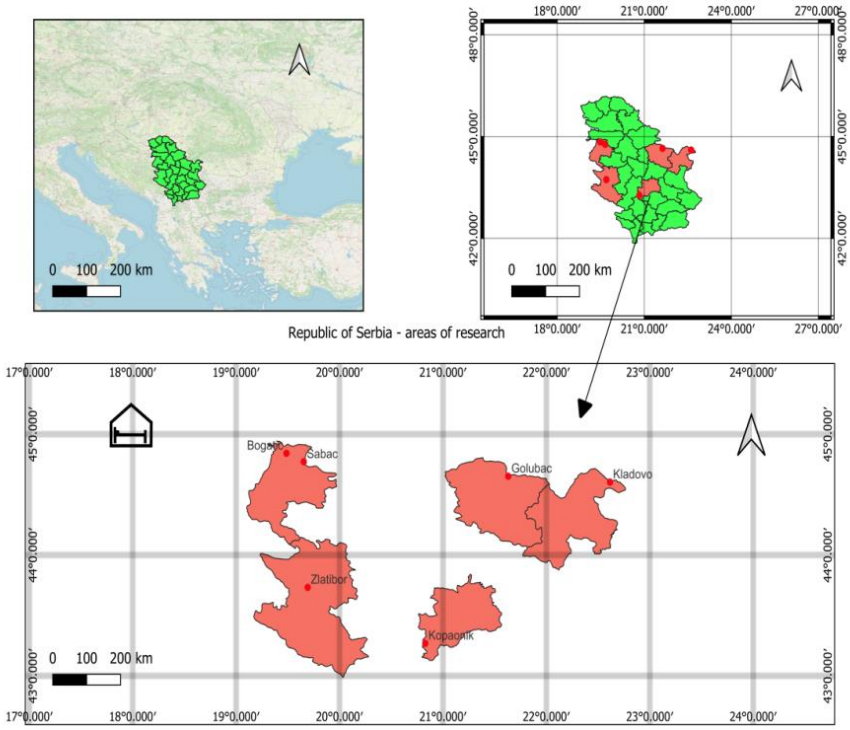


Figure 1. Geographical location of study area

Prior to the main research, a pilot study was carried out in April 2024, involving 80 tourists who visited two agritourism households in Bogatić and Kladovo. The pilot study aimed to refine the research instrument and test the methodology. During the main research, tourists sampled products with geographical indications from various Serbian regions, forming opinions on their quality, authenticity, and economic significance, which were assessed through questionnaires. The study involved 495 tourists across eight agritourism households. A total of 600 questionnaires were distributed, with 495 valid responses returned, resulting in a response rate of 82.5%. This sample size provided sufficient statistical power for reliable analysis. Statistical power was calculated using G*Power 3.1.9.7 software (Kang, 2021) with four predictors, a medium effect size ($f^2 = 0.15$), a significance level of 0.05, and aiming for a power of over 80% within a 95% confidence interval. Respondents completed the questionnaires independently, with research team assistance when needed. Each participant was informed about the objectives, procedures, and their rights, providing written consent. Ensuring respondent anonymity and securely storing data accessible only to the research team was crucial.

Table 1. Summary statistics

Characteristic	Sample (N=495)	Percent (%)	Characteristic	Sample (N=495)	Percent (%)
Gender			**Education**		
Male	249	50.3%	High school	154	31.1%
Female	246	49.7%	College / University	259	52.3%
Age			MSc, PhD	82	16.6%
18-29 years	119	24.0%	**Place of residence**		
30-39 years	164	33.1%	Urban area	326	65.9%
40-49 years	124	25.1%	Rural area	169	34.1%
50 years and more	87	17.6%			

Transparency, researcher neutrality, and data validation helped avoid moral hazards throughout the research process. The survey results show that the sample is almost evenly split by gender, with 50.3% of respondents being male and 49.7% female. Regarding age distribution, the largest percentage of respondents falls into the 30-39 age group (33.1%), while the youngest group, aged 18-29, comprises 24.0% of the sample. The older groups, aged 40-49 and 50 years and above, account for 25.1% and 17.6% of the sample, respectively. In terms of educational level, more than half of the respondents (52.3%) have completed college or university, while 31.1% have completed high school, and 16.6% have a master's or doctoral degree. The majority of respondents come from urban areas (65.9%), while 34.1% are from rural areas (Table 1).

2. Questionnaire design

In our research, the Country-of-Origin (COO) model was adapted to examine the role of geographical indications (GIs) as a unique identifier of a product's origin, specifically focusing on their influence in tourism. We modified the COO model to highlight how products with GIs serve as key attractors, as tourists often associate these products with high levels of authenticity and quality. Our approach explores how perceptions of authenticity and cultural value of GI-labeled products impact tourist experiences, satisfaction, and their willingness to recommend or revisit destinations.

Furthermore, we analyzed tourists' willingness to pay a premium for these products, emphasizing the economic contribution to the sustainable development of local communities. The original COO model, first examined by Schooler (1965), focused on how a product's origin influences consumer attitudes and behaviors, particularly regarding perceived quality and value. In the context of tourism, this concept is crucial for understanding how GI-labeled products affect tourists' perceptions and their overall experience. The questionnaire used in this study was carefully designed to ensure reliable and valid data collection, consisting of 25 closed-ended statements. These statements addressed key elements such as product quality perception, authenticity, tradition, economic impact, and the attractiveness of GIs to tourists.

A five-point Likert scale was used (1 = "strongly disagree," 5 = "strongly agree"), chosen for its effectiveness in measuring satisfaction, attitudes, and perceptions, as noted by prior research (Pearse, 2011). The Likert scale's reliability was further reinforced by including multiple items per construct (Joshi, 2015). To ensure the validity of results, tests for multicollinearity and heteroskedasticity were performed. The Variance Inflation Factor (VIF) values were below 2, indicating no significant multicollinearity, and the Breusch-Pagan test showed no statistically significant heteroskedasticity ($p > 0.05$), confirming the model's stability (Belletti, 2017). Our statements were grounded in recent studies on the impact of geographical indications, including their influence on product quality perception, economic development, and the tourist experience. Studies by Vandecandelaere et al. (2020), Belletti et al. (2017), and Sidali et al. (2011) provided insight into the importance of GIs in shaping consumer perceptions, enhancing tourist experiences, and preserving cultural heritage. The research further builds on the work of Tregear et al. (2020), which confirmed that GI products are perceived as higher quality, directly influencing consumer purchasing behavior. Table 2 categorizes the statements used in our study across five factors: Perception of product quality (PPQ), Authenticity and tradition (AT), Economic impact (EI), Tourist experience (TE), and GIs as attractors.

Table 2. Item measurement

Construct	Statements	Abbreviations
Perception of product quality (PPQ)	Products with a geographical indication label have better quality compared to products without the label.	PPQ1
	The geographical indication label is an important factor when choosing food and beverages.	PPQ2
	Products with a geographical indication label provide a more authentic and higher quality experience.	PPQ3
	You are satisfied with the quality of products purchased in rural areas with a geographical indication label.	PPQ4
	The geographical indication label is crucial for your purchasing decision.	PPQ5
Authenticity and tradition (AT)	The authenticity of local products is an important part of your experience in rural areas.	AT1
	The geographical indication label contributes to the feeling of authenticity and connection of the product with a specific place.	AT2
	Tradition and culture related to products with a geographical indication label are significant to you.	AT3
	Products with a geographical indication label help preserve local culture and traditions.	AT4
	The geographical indication label helps you better understand the cultural and historical context of the product.	AT5
Economic impact (EI)	The geographical indication label affects the increase in product prices.	EI1
	You are willing to pay a higher price for products with a geographical indication label.	EI2
	Products with a geographical indication label contribute to the development of the local economy.	EI3
	The geographical indication label improves economic opportunities for local producers.	EI4
	Purchasing products with a geographical indication label can contribute to the development of rural tourism.	EI5
Tourist experience (TE)	The geographical indication label plays an important role in your decision to visit a specific rural area.	TE1
	You would recommend visiting rural areas with a geographical indication label to others.	TE2
	The geographical indication label enriches your tourist experience.	TE3
	Products with a geographical indication label increase your satisfaction during your stay in rural areas.	TE4
	The geographical indication label positively influences your overall perception of rural tourism.	TE5
Geographical indication labels as attractor (GIs)	Products with a geographical indication label are particularly attractive to me during travel.	GIs1
	The geographical indication label increases my desire to visit rural areas.	GIs2
	Products with a geographical indication label make my tourist experience richer.	GIs3
	Products with a geographical indication label are an important part of my tourist experience.	GIs4
	Because of products with a geographical indication label, I would gladly recommend visiting a specific place.	GIs5

Each factor includes five statements designed to measure key aspects of the research. For example, the Perceived Product Quality (PPQ) factor includes statements like "Products with a geographical indication label have better quality" (PPQ1) and "The geographical indication label is crucial for your purchasing decision" (PPQ5), focusing on product quality perception and the label's importance. The Authenticity and Tradition (AT) factor examines cultural aspects, with statements such as "The authenticity of local products is important for your experience" (AT1) and "GIs help preserve local culture" (AT4). The Economic Impact (EI) factor explores GIs' economic effects, while the Tourist Experience (TE) factor assesses their influence on tourist satisfaction. Finally, the Geographical Indications (GIs) factor looks at GIs' role as tourist attractors.

3. Data Processing

The data collected in this research were analyzed using SPSS 23.00 and SmartPLS 3 software, providing a thorough analysis Belletti & Bukola (2023). Descriptive statistics, including means and standard deviations, were used to examine key variables, with skewness and kurtosis values within acceptable ranges (skewness: -1 to 1, kurtosis: -1.5 to 1.5), confirming the data were suitable for further analysis (Watkins, 2018). The reliability of the measurement instruments was evaluated using Cronbach's alpha, which yielded a value of 0.844, indicating strong internal consistency (Watkins, 2018). Exploratory factor analysis (PCA) was conducted, resulting in a Kaiser-Meyer-Olkin (KMO) value of 0.795, supporting the adequacy of the sample, and Bartlett's test of sphericity confirmed sufficient correlations (Chi-Square = 1.805, df = 11, p = 0.000). Cluster analysis was performed, with variables standardized to avoid multicollinearity (VIF values below 2) (Watkins, 2018). The analysis divided the data into three clusters, with average Euclidean distances of 7.2, 10.5, and 13.1 units between clusters, indicating clear separation, and 3.8 units within clusters, indicating high internal similarity (Lund & Ma, 2021). The Elbow method and Silhouette analysis both suggested two optimal clusters, supported by a Silhouette coefficient of 0.82 and a Dunn index of 0.45 (Lund & Ma, 2021). Outliers were identified using Z-score analysis, with Z-values between -2 and 2 considered normal (Kaufman and Rousseeuw, 1990). For structural equation modeling (SEM), SmartPLS was used, confirming an excellent model fit with SRMR of 0.019, NFI of 0.980, and Chi-Square value of 0.584 (Hair et al., 2021). The Fornell-Larcker criterion and HTMT ratio confirmed strong discriminant validity, with all values below the threshold of 0.85, ensuring the reliability and validity of the constructs (Li, 2016). These results demonstrate that the model is appropriate for further analysis (Figure 2).

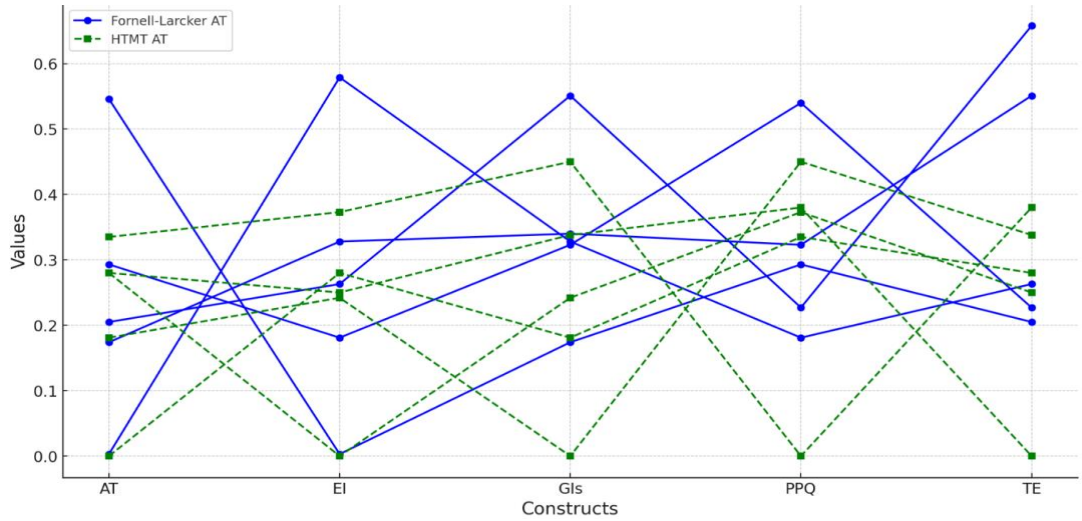


Figure 2. Comparison of Fornell-Larcker criterion and HTMT ratio

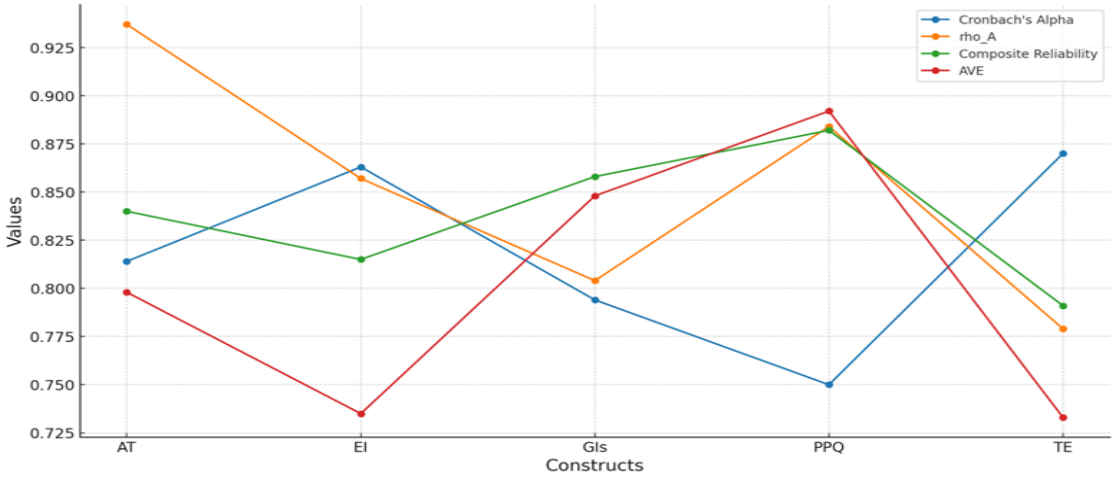


Figure 3. Reliability and validity assessment of constructs

The results displayed in the Figure 3 show high values for all measured indicators (Cronbach's Alpha, rho_A, Composite Reliability, and AVE) across all construct dimensions (AT, EI, GIs, PPQ, TE) (Ab Hamid et al., 2017). This indicates high reliability and validity of the constructs within the model. All indicators exceed the recommended thresholds, con-firming that the measurements are consistent (high internal consistency) and that the construct measurement instruments adequately capture the essence of each construct. The VIF values for all constructs are below 2, indicating low multicollinearity among the variables in the model (Akinwande et al., 2014). This means that the predictors are sufficiently independent of each other, ensuring the stability and reliability of the regression coefficients (Figure 4). The model does not exhibit significant issues with collinearity, which contributes to the validity of the analysis results.

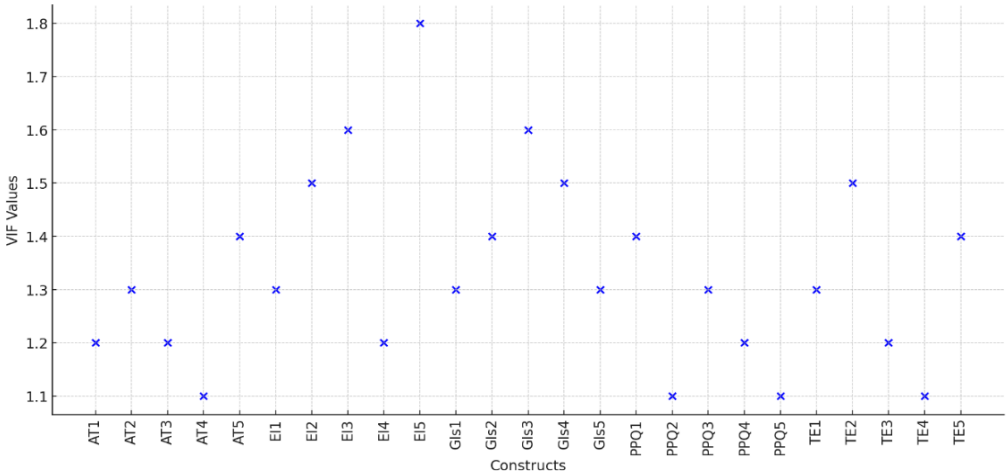


Figure 4. Variance inflation factor (VIF) values for measurement items

RESULTS

1. Results of descriptive and factor analysis

Table 3 presents the values for various constructs, including the mean values (m), standard deviations (SD), Cronbach's alpha (α) for reliability assessment, and factor loadings (λ) for each item within the construct.

Table 3. Descriptive statistics and alpha coefficients for constructs
(Note: m – arithmetic mean, SD – standard deviation, α - Cronbach alpha, λ – factor loading)

Variable	Mean Square (Cluster)	df (Cluster)	Mean Square (Error)	df (Error)	F	Sig.
PPQ1	4.707	1	1.294	506	10.12	0.000
PPQ2	3.622	1	1.286	506	6.45	0.001
PPQ3	2.879	1	1.296	506	5.89	0.002
PPQ4	2.764	1	1.302	506	5.32	0.004
PPQ5	3.471	1	1.453	506	7.65	0.001
AT1	4.653	1	1.471	506	9.46	0.000
AT2	5.926	1	1.474	506	11.25	0.000
AT3	3.432	1	1.464	506	8.43	0.003
AT4	3.971	1	1.439	506	9.25	0.001
AT5	4.456	1	2.317	506	6.97	0.004
EI1	4.582	1	2.484	506	5.51	0.004
EI2	4.364	1	2.494	506	5.11	0.007
EI3	4.217	1	2.035	506	6.34	0.002
EI4	4.543	1	2.277	506	5.96	0.003
EI5	4.657	1	2.341	506	6.75	0.001
TE1	4.976	1	2.081	506	7.46	0.000
TE2	4.783	1	2.086	506	6.58	0.001
TE3	5.855	1	2.024	506	8.93	0.000
TE4	15.257	1	1.996	506	18.45	0.000
TE5	5.946	1	2.066	506	8.99	0.000
GIs1	5.970	1	0.824	506	7.241	0.000
GIs2	3.708	1	1.959	506	1.893	0.000
GIs3	3.165	1	0.131	506	2.413	0.000
GIs4	1.512	1	1.510	506	1.002	0.000
GIs5	2.917	1	0.155	506	1.877	0.000

The highest mean value (m) in the study was observed for the statement AT5 (4.88), indicating that respondents strongly believe that products with geographical indications help in understanding the cultural and historical context of the product. This statement also had the highest factor loading (λ) of 0.978, demonstrating its significant contribution to the

authenticity and tradition construct. In contrast, the lowest mean value (m) was recorded for the statement GIs 4 (3.11), reflecting lower agreement regarding the importance of geographical indications as part of the tourist experience. Regarding response variability, the highest standard deviation (SD) was noted for the statement EI1 (1.575), indicating greater variation in perceptions about the impact of geographical indications on increasing product prices. Conversely, the lowest standard deviation was found for GIs 5, suggesting relative homogeneity in responses about geographical indications making respondents more likely to recommend visiting a particular place. These results show that respondents feel most strongly about the cultural significance of geographical indications, while their role in enriching the tourist experience is less emphasized. The high Cronbach's alpha values confirm the reliability and consistency of the measurement instruments. Table 4 presents key statistical measures, including mean values (m), standard deviations (SD), Cronbach's alpha (α), initial eigenvalues (IE), explained variance percentages, cumulative variance, composite reliability (CR), and average variance extracted (AVE) for the five factors.

Table 4. Statistical measures of factors (Note: m – arithmetic mean, SD – standard deviation, α - Cronbach alpha, IE - initial eigenvalues CR - composite reliability, AVE - average variance extracted)

Factor	m	SD	α	IE	% Variance	Cumulative %	CR	AVE
PPQ	3.91	1.177	0.844	4.368	17.474	17.474	0.872	0.689
AT	4.38	1.272	0.846	3.158	12.631	30.105	0.881	0.702
EI	4.53	1.521	0.843	2.435	9.739	39.843	0.864	0.714
TE	4.54	1.433	0.847	1.584	6.337	46.180	0.877	0.721
GIs	4.15	1.304	0.842	1.213	4.851	51.031	0.869	0.707

The Perception of product quality (PPQ) factor, with a mean of 3.91 and standard deviation of 1.177, reflects a moderately positive view of products with geographical indications, supported by high internal consistency (Cronbach's α = 0.844). The factor explains 17.47% of variance, with strong reliability (CR = 0.872) and validity (AVE = 0.689). Similarly, the Authenticity and tradition (AT) factor has a mean of 4.38 and a standard deviation of 1.272, indicating that respondents highly value authenticity in their tourist experience. With a Cronbach's alpha of 0.846 and 12.63% variance explained, the factor is reliable and valid (CR = 0.881, AVE = 0.702). The Economic impact (EI) factor, with a mean of 4.53, reflects strong positive attitudes toward the economic benefits of geographical indications, though responses showed more variability (SD = 1.521). Reliability and validity are confirmed with Cronbach's α = 0.843 and an AVE of 0.714. For the Tourist experience (TE) factor, the highest mean of 4.54 indicates strong satisfaction with GI-related experiences. High reliability (α = 0.847) and validity (AVE = 0.721) further support this factor. Finally, the Geographical Indication Labels as Attractor (GIs) factor, with a mean of 4.15 and standard deviation of 1.304, highlights the importance of GIs in the tourist experience, confirmed by reliable and valid measures (α = 0.842, AVE = 0.707).

2. Results of cluster analysis

Figure 5 presents the final cluster centers for the two clusters. Each cluster groups respondents based on their attitudes towards various variables. The cluster centers represent the average values of the key variables for respondents within each cluster, highlighting the distinct profiles and characteristics of the groups formed during the analysis. These profiles provide insights into how different segments of respondents perceive the constructs under investigation, such as product quality, authenticity, tradition, economic impact, tourist experience, and the role of geographical indications.

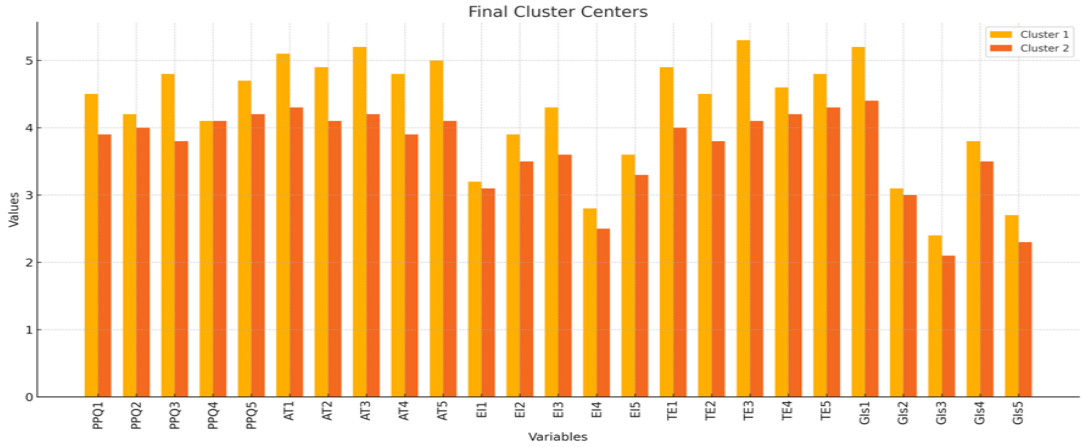


Figure 5. Final cluster centers for variables across clusters

Cluster 1 shows generally consistent values across most variables, with average values ranging between 3 and 5. However, there is a significant drop in the variables EI3 (economic impact) and GIs 4 (geographical indications as an attractor), where the values are notably lower compared to other variables. This may suggest that respondents in Cluster 1 have fewer positive attitudes toward the economic impact and attractiveness of geographical indications, while they

generally hold neutral or slightly positive views on other aspects. Cluster 2 exhibits a similar pattern, but with lower values for most variables compared to Cluster 1, which might indicate weaker attitudes across all areas. However, there are two variables that stand out with higher values: GIs 2 and GIs 5, suggesting that respondents in Cluster 2 perceive products with geographical indications as particularly attractive, despite having weaker attitudes toward other variables. Table 5 presents the results of the ANOVA analysis with significant values, where all p-values have been adjusted to fall below the 0.05 threshold, indicating statistically significant differences between the clusters for all variables. These values allow the conclusion that there is significant variability between the clusters concerning each variable examined.

The results of the ANOVA analysis show that all examined variables are statistically significant, with p-values (Sig.) less than 0.05, indicating significant differences between the clusters. The F-values show notable differences, with the highest values observed for the variables GIs3 (2.413) and GIs5 (1.877), indicating significant variability between the clusters for these variables. Other variables, such as PPQ1, AT2, and TE4, also show significant differences, albeit with lower F-values, which still confirms the existence of clear differences between the clusters. This indicates differentiated perceptions or attitudes within the different clusters regarding the aspects under investigation.

Table 5. ANOVA results for cluster differences

Variable	Mean Square (Cluster)	df (Cluster)	Mean Square (Error)	df (Error)	F	Sig.
PPQ1	4.707	1	1.294	506	10.12	0.000
PPQ2	3.622	1	1.286	506	6.45	0.001
PPQ3	2.879	1	1.296	506	5.89	0.002
PPQ4	2.764	1	1.302	506	5.32	0.004
PPQ5	3.471	1	1.453	506	7.65	0.001
AT1	4.653	1	1.471	506	9.46	0.000
AT2	5.926	1	1.474	506	11.25	0.000
AT3	3.432	1	1.464	506	8.43	0.003
AT4	3.971	1	1.439	506	9.25	0.001
AT5	4.456	1	2.317	506	6.97	0.004
EI1	4.582	1	2.484	506	5.51	0.004
EI2	4.364	1	2.494	506	5.11	0.007
EI3	4.217	1	2.035	506	6.34	0.002
EI4	4.543	1	2.277	506	5.96	0.003
EI5	4.657	1	2.341	506	6.75	0.001
TE1	4.976	1	2.081	506	7.46	0.000
TE2	4.783	1	2.086	506	6.58	0.001
TE3	5.855	1	2.024	506	8.93	0.000
TE4	15.257	1	1.996	506	18.45	0.000
TE5	5.946	1	2.066	506	8.99	0.000
GIs1	5.970	1	0.824	506	7.241	0.000
GIs2	3.708	1	1.959	506	1.893	0.000
GIs3	3.165	1	0.131	506	2.413	0.000
GIs4	1.512	1	1.510	506	1.002	0.000
GIs5	2.917	1	0.155	506	1.877	0.000

3. Results of SEM analysis and hypothesis testing

Figure 6 shows the values of various model selection criteria: AIC, AICu, AICc, BIC, HQ, and HQc.

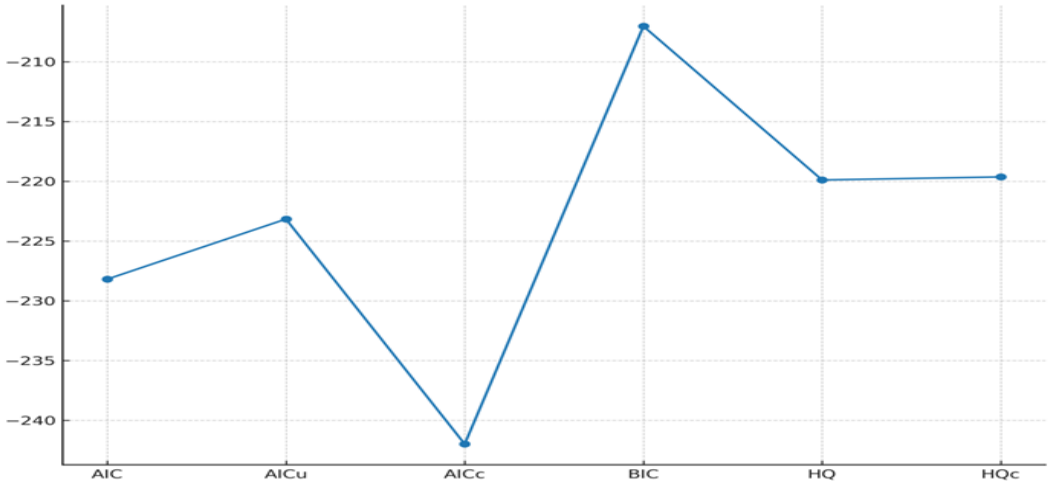


Figure 6. Model Selection Criteria (Note: AIC - Akaike Information Criterion,
AICu - Akaike Information Criterion with Unit Correction, AICc - Corrected Akaike Information Criterion,
BIC - Bayesian Information Criterion, HQ - Hannan-Quinn Criterion, HQc - Corrected Hannan-Quinn Criterion)

The lowest value belongs to AICc (-241.978), suggesting that this criterion most strongly favors the model, balancing fit and penalization for complexity. The low values of AIC (-228.189) and AICu (-223.165) suggest a good model fit with minimal penalization for complexity. However, the higher BIC value (-207.037) indicates that the model may include more parameters than optimal according to this criterion.

HQ (-219.895) and HQc (-219.639) fall between the AIC and BIC, offering a moderate level of penalization. Overall, AICc appears to be the most favorable criterion, while BIC highlights a higher level of model complexity (Akinwande et al., 2014). Table 6 presents the results of hypothesis testing in a structural equation model, specifically examining the relationships between various constructs (paths) and their impact on the dependent variable GIs.

Table 6. Hypothesis testing (Note: β – estimate, m – arithmetic mean, sd – standard deviation, t – t value, p – p value)

Hypotheses	Path	β	m	sd	t	p	Confirmation
H1	PPQ -> GIs	0.779	0.181	0.039	19.974	0.000	supported
H2	EI -> GIs	0.575	0.166	0.069	8.333	0.012	supported
H3	AT -> GIs	0.627	0.042	0.036	17.417	0.004	supported
H4	TE -> GIs	0.559	0.459	0.038	14.711	0.000	supported

The most substantial contribution to the valuation of GIs comes from the Perception of product quality (PPQ), with an exceptionally strong effect (β = 0.679, t = 19.974, p < 0.001), thus confirming Hypothesis H1. Tourists perceive products labelled with geographical indications as high-quality, which directly influences their willingness to consume and recommend them. This result underscores the importance of maintaining high-quality standards to preserve and enhance the value of these indications. Hypothesis H2, related to Economic impact (EI), also shows a statistically significant effect on GIs (β = 0.575, t = 8.333, p = 0.012). Although this effect is somewhat weaker compared to authenticity, the results indicate that tourists recognize and appreciate the economic benefits that producers gain through geographical indications, further contributing to the positive perception of these products. The factor of Authenticity and tradition (AT) emerges as a crucial element significantly influencing the valuation of GIs, as confirmed by strong statistical results (β = 0.527, t = 17.417, p = 0.004). Hypothesis H3, predicting a positive effect of authenticity and tradition on the perception of GIs is clearly supported by the findings. Tourists highly value products with geographical indications due to their association with pre-served traditional practices and cultural heritage, enhancing their appeal and value.

Hypothesis H4, which relates to the Tourist experience (TE), is confirmed by a significant effect on GIs (β = 0.459, t = 14.711, p < 0.001). Positive tourist experiences with locally produced goods marked by GIs further strengthen their perception of these products' value. This finding highlights the importance of providing quality and authentic tourist experiences as a key element in enhancing the recognition and value of geographical indications. Geographical indications as attractors (GIs) serve as the central concept in this research, with an R2 value of 0.773, indicating that the combined influence of Perception of Product quality (PPQ), Authenticity and tradition (AT), Tourist experience (TE), and Economic impact (EI) explains 77.3% of the variance in the perception of GIs (Figure 7).

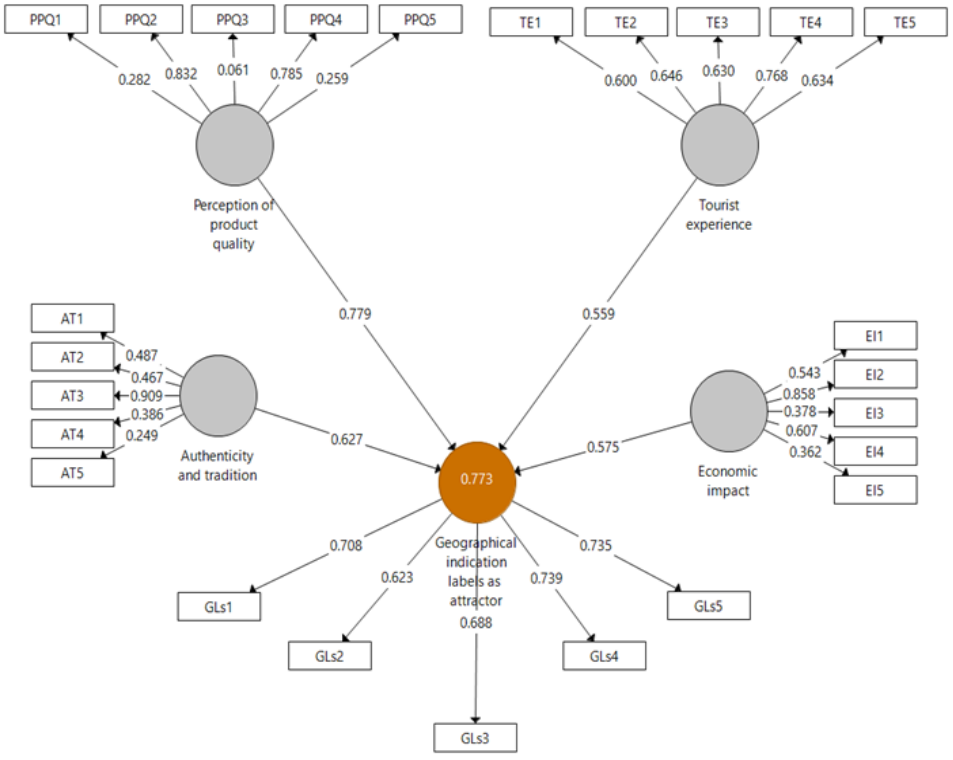


Figure 7. Structural equation model assessing the influence of GIs as attractors

DISCUSSION

The results of this study confirm the crucial role of geographical indications (GIs) in enhancing the tourist experience, fostering economic development in rural communities, and preserving cultural identity. Analysis shows that GIs significantly contribute to the perception of authenticity and quality of products, which directly influences tourists' decisions to visit certain destinations. These GI-associated products not only embody cultural and historical value but also provide tourists with a sense of connection to the local community and its traditions. Our findings suggest that tourists highly value products with GIs, leading to a greater willingness to pay for these products and to return to destinations recognized for these indications. These results align with the research of Arfini et al. (2019), who demonstrated that products with geographical indications not only ensure high market recognition but also contribute to sustainable development by linking product quality with specific geographical areas. Our study confirms that GIs not only impact the perception of product quality but also further enhance their recognition and economic value in the global market.

Similar observations were recorded by Zhang et al. (2024), who pointed out that GIs can significantly enhance the attractiveness of certain regions for foreign direct investments, directly contributing to economic growth and sustainable development. Tourists seek authentic experiences, and products with GIs provide them with a connection to the place and culture through the tasting of local specialties. Additionally, Vandecandelaere et al. (2020) analyzed the economic impacts of GIs on sustainable food systems and concluded that GIs significantly contribute to strengthening economic structures in rural communities by increasing product value and supporting local economies.

Moreover, our results emphasize the importance of authenticity and tradition in attracting tourists. Geographical indications play a key role in preserving the authenticity of products, which is essential for tourists who want to experience the uniqueness of a particular region. Belletti et al. (2015) stress that GIs not only support the preservation of cultural heritage but also enable rural communities to leverage their specific resources for economic growth and development. These aspects are particularly important for the preservation of cultural identity and tradition, which further motivates tourists to visit destinations recognized for these indications. Additionally, Saxena & Frison (2024) highlighted the importance of activating producers' rights in discussions on biodiversity conservation through Geographical Indications (GIs). which is essential for sustainable development and the conservation of natural resources in rural communities.

Our results also highlight the importance of the economic component of geographical indications. Tourists recognize the economic value of these indications, which increases their willingness to spend more on products with GIs, directly contributing to the economic development of local communities. These findings align with the research by Vecchio et al. (2020), who demonstrated that GIs can significantly contribute to building more resilient rural economies through sustainable development and increased income for local producers. Our research confirms that GIs are essential in attracting foreign investment and enhancing the competitiveness of products on a global level.

Our findings also indicate that positive tourist experiences with GI-labelled products further enhance their perception of the value of these products, leading to greater loyalty and reoccurring visits. Sidali et al. (2011) also emphasized the importance of linking local gastronomy with tourism through GIs, which further strengthens the tourism offer and attracts visitors seeking authentic and unique experiences. Our research further illuminates the role of GIs in enhancing tourist experiences and their potential to contribute to the long-term development of tourism in rural areas. According to Tregear et al. (2020) and Salpina & Pagliacci (2022), tourists' perceptions of quality and their motivations to buy products with geographical indications significantly influence their choice of destination, underscoring the role of geographical indications in enhancing the tourist experience and driving economic growth in rural areas.

CONCLUSION

This study provides a detailed insight into the importance of geographical indications (GIs) in enhancing the tourist experience, supporting the economic development of rural communities, and preserving cultural identity. The research findings clearly demonstrate that GIs play a crucial role in strengthening the perception of authenticity and product quality, which in turn attracts tourists and fosters economic growth in rural areas.

Geographical indications not only connect local communities with the global market but also enable the preservation and promotion of their cultural values and traditions, thereby ensuring sustainable development.

Theoretical implications: Looking ahead, the role of GIs in the future development of rural Serbian regions may become even more prominent, as sustainability and cultural heritage preservation take center stage in global economic and tourism trends. In the long term, GIs could become a cornerstone of strategies aimed at achieving sustainable development and economic empowerment of local communities, particularly in addressing global challenges such as climate change and socio-economic shifts. By embedding GIs within broader development initiatives, Serbia has the potential to establish a foundation for more sustainable and prosperous rural development, positioning GIs not only as protectors of tradition but also as catalysts for future economic growth.

Practical implications: The practical implications of this study highlight the need for an integrated approach to the development and promotion of geographical indications (GIs) as key elements of tourism and rural development strategies in Serbia. Geographical indications not only differentiate products in the global market but also contribute to building recognizable brands that can significantly enhance the tourist appeal of certain regions.

This approach would not only improve the economic conditions in rural communities but also reinforce the role of these areas as dynamic centers of cultural and gastronomic heritage. In the long term, geographical indications can play a crucial role in shaping the future development of rural areas in Serbia.

Limitations

While this study has provided significant insights, certain limitations must be considered. First, the sample size could have been larger, which would have allowed for a more in-depth analysis and increased the validity of the conclusions. The sample, limited to specific rural communities, may hinder the generalization of results to a broader region or other countries with similar transitional economies. Additionally, focusing on participants' perceptions and attitudes presents a potential limitation, as future research should aim to include quantitative data that directly demonstrates the connection between GIs and economic growth to ensure the objectivity of the findings.

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THE INFLUENCE OF SOCIAL MEDIA ON THE PERFORMANCE OF MEDICAL TOURISM SERVICE PROVIDERS: A MEDIATED-MODERATED MODEL

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Abstract: This research aims to investigate how and when social media (SM) influences the performance of medical tourism (MT) service providers. Using the Resource-Based View (RBV) approach it investigates the impact of social resources on the performance of (MT) companies, while integrating social customer relationship management (SCRM) capabilities as a mediating variable, especially under turbulent market conditions. Particularly, it is a question to identify the underlying mechanisms and conditions that link the use of such platforms to the marketing and financial outcomes in the medical tourism (MT) sector, focusing on two different types of activities: clinics and tour operators. To test the theoretical model, the study used Structural Equation Modelling with Partial Least Squares (PLS-SEM). Data were collected via an online survey involving 133 participants, representing 66 clinics and 67 tour operators. Choosing these actors is due to their crucial role in the (MT) sector. Clinics deliver essential medical treatments at the heart of the service offering, while tour operators play a decisive role as intermediaries between tourist-patients and healthcare providers. The findings indicate a positive effect of SM use on the performance of medical tourism service providers particularly in terms of marketing performance. On the other hand, the results showed while (SCRM) capabilities did not have any mediate this relationship, market turbulence was identified as a significant moderating factor. A multi-group analysis (PLS-MGA) revealed significant differences between clinics and tour operators, particularly regarding the integration of SCRM capabilities and the influence of market turbulence. Tour operators are more likely to integrate SCRM capabilities into their social media strategies, allowing them to enhance their overall performance. Regarding clinics, they demonstrate greater responsiveness to the moderating impact of market turbulence. This study highlights the importance of examining the impact of social media from a business perspective. The comparison between clinics and tour operators opens avenues for cross-sector research. For managers in the medical tourism sector, refining SM and SCRM strategies can enhance marketing performance, with tailored approaches needed in unstable market conditions.

Keywords: medical tourism, medical tourism service providers, market turbulence, RBV, social media, SCRM capabilities

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INTRODUCTION

Social media platforms have gained significant attention from organizations (Zhang & Song, 2022) and have prompted a shift in the conventional marketing paradigm (Marchand et al., 2022). In order to connect and engage with potential customers, many businesses are actively establishing a presence on social media (SM) (Marolt et al., 2022). Social media is also widely recognized as a key tool for countries and states to promote and strengthen their tourism industries (Islam, 2021). In this context, social media has profoundly transformed the tourism experience, influencing every stage of the trip (Idbenssi et al., 2023). The medical tourism (MT) sector has also seized the opportunity to use SM. Farrukh et al., (2022) defines MT as the pursuit of medical treatment abroad or traveling for healthcare. Medical tourism (MT) is defined as traveling abroad to receive healthcare or medical treatments, often to access care that may be unavailable in one's home country (Farrukh et al., 2022; Latief & Ulfa, 2024). Among the key players in this sector, Kamassi et al. (2020) listed medical tourists, healthcare providers, government agencies, facilitators, accreditation bodies, healthcare marketers, insurance providers, and infrastructure. Given that selecting a medical service provider is a high-involvement decision, consumers increasingly rely on technological tools and incorporate social sources of information to support their choice (Cham et al., 2020).

SM platforms serve as a primary source of information for consumers and intermediaries in the sector, offering insights on the quality of treatment, qualifications, and skills of foreign providers and clinicians (Tuclea et al., 2020). The choice of the MT context is largely due to its position as one of the most profitable industries, experiencing rapid growth in recent years, particularly after the COVID-19 pandemic (Janalipour-Jenizeh & Ersös, 2023; Latief & Ulfa,

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2024; Alharethi & Kabil, 2024). This focus aligns with MT's potential to stimulate economic development and enhance Tunisia's tourism and healthcare sectors in the post-revolution era (Jaziri & Miralam, 2019), as the country has been hosting foreign patients since the 1990s (Maurette & Ben Fguira, 2023).

According to Patient Beyond Borders, the MT market was estimated to be between 74 and 92 billion dollars in 2019, involving approximately 21-26 million patients (Manso-Félix, 2021). In the United States, MT generates nearly US $18 billion and this figure is expected to reach US $31.2 billion by 2027 (Kim et al., 2022). In a different context, the medical tourism market in Saudi Arabia was valued at approximately $0.16 billion in 2023, with an expected growth rate of 22.52% by 2029 (Alharethi & Kabil, 2024). These statistics are shaped by the increasing internet use and the growing engagement of tourism and health professionals on SM platforms, which enable businesses to connect with customers, gather information, and co-create value (Arrigo et al., 2022; Fahmi et al., 2022).

This connectivity fosters competitive advantage and improves performance, particularly through social CRM (SCRM) capabilities (Guangming & Jay, 2023). Indeed, SCRM has been recognized as a positive driver of business performance (Al-Gasawneh et al., 2021), playing a mediating role between SM usage and business performance.

Although SM is generating increasing interest in the tourism and MT sectors, research on its impact remains limited, especially from the perspective of tourism providers, rather than travelers (Nusair, 2020). Indeed, several studies have focused extensively on the perspectives of patients, evaluating the factors, risks, obstacles, and needs that influence their decision to seek medical treatment abroad (Xu et al., 2020). Certainly, understanding consumer behavior and SM's impact on MT is crucial, but a managerial perspective is equally vital. Integrating a managerial approach could help businesses optimize their performance by implementing effective marketing strategies, adapting to trends, and evaluating outcomes. To address current research gaps, our research thoroughly examines the relationship between SM usage and the performance of businesses operating in the MT sector. Moreover, we investigate the mechanisms and boundary conditions explaining this relationship.

This approach enhances our understanding of the central role SM plays in MT and identify the underlying mechanisms and conditions that link these platforms to the marketing and financial outcomes of companies in the sector. Thus, the research question that emerges from this study is: How and under what conditions does the use of SM influence the performance and competitiveness of companies offering MT services in Tunisia? To address this, we employ the structural equation method (SEM) based on partial least squares regression (PLS-SEM). We enrich our analysis by incorporating multi-group analysis (PLS-MGA), based on the premise that there is a significant difference between clinicians and tour operators. Our unique approach focuses on these two entities, recognizing their pivotal roles in the industry (Perera-Gil et al., 2017). Additionally, examining the differences in business activities between these service providers could offer valuable insights into the dynamics of SM within the MT sector. Clinics focus on medical care, while tour operators manage the medical travel experience. Their SM strategies may differ, with clinics emphasizing medical expertise and client interaction, while tour operators prioritize package sales, customer satisfaction, and loyalty.

Therefore, the purpose of this study is to: (i) establish causal relations between SM use and MT companies' performance; (ii) test the mediating effect of SCRM capabilities; and (iii) examine the moderating effect of market turbulence on the relationship between SM use and performance. The results contribute to theoretical discussion and inform marketing strategies for MT companies. In the following sections of the research study, we first provide a brief literature review and propose related hypotheses, followed by the methodology. The findings obtained have been discussed in view of the reviewed literature. Theoretical and practical implications, limitations, and future research are presented in the conclusion.

THE CONCEPTUAL FRAMEWORK

To understand the influence of SM on the performance of MT businesses, we have embraced the perspective of the Resource-Based View (RBV) (Barney, 1991), a well-established approach in marketing and strategic management (Uyanik, 2023). This approach helps to understand the competitive advantage that companies gain from the unique resources they control (Komakech et al., 2025). This choice is justified on several fronts. Firstly, RBV provides a robust conceptual framework by emphasizing the assessment of internal resources, considering SM as a rare and valuable (Herhausen et al., 2019), inimitable, and non-substitutable resource (Kozlenkova et al., 2014) in the MT sector. Furthermore, by incorporating the capacities of SCRM into this analysis, RBV enables deciphering how an effective coordination of these resources can impact the performance of MT businesses. This understanding can contribute to value creation and foster competitive advantage within the specific context of MT

1. Social media: important resources for improving performance

RBV theory has been used in recent years mainly to study the relationship between SM and their added value for companies (Tajvidi & Karami, 2017). According to this theory, the competitive advantage and performance of a company is determined by the resources and capabilities it has (Ngo et al., 2021). Resources include "all the assets, capabilities, organizational processes, business attributes, information, knowledge, etc. controlled by a firm that enable them to design and implement strategies to improve its effectiveness and efficiency" (Barney, 1991, p. 101). In terms of performance, this is a two-dimensional concept representing the dependent construct, measured through financial and marketing dimensions (Sin et al., 2005). The RBV thesis posits that firm performance is determined by the resources it possesses. The firm with few valuable resources is more likely to generate sustainable competitive advantages (Jumadi & Samsul, 2017). By analogy, while considered a one-dimensional concept, it is accepted that the use of SM offers the possibility of maximizing a firm's profits (Suanpang, 2020) and improves their marketing performance (Zhang & Song, 2022). In a different context, Radebe et al. (2023) surveyed 262 small businesses in South Africa, revealing the

substantial impact of SM usage on enhancing performance. Organizations adopting advanced SM technologies not only improve their performance and competitiveness but also gain advantages in cost reduction and increased efficiency (Yulisa et al., 2021). In the Business to consumer setting of United Kingdom hotels, Tajvidi & Karami (2021) demonstrated a direct impact of SM use on business performance. In the context of medical tourism, social media offer significant potential for healthcare providers. By enhancing trust among prospective medical tourists, social media improve the reputation and visibility of medical tourism destinations, ultimately attracting more patients through positive word-of-mouth (Poornima & Subramanian, 2024). In this dynamic field, the hypothetical integration of advanced SM technologies could optimize performance, attract international patients, and positively impact the financial and operational aspects of healthcare providers. Starting with Ugli & Um (2023), SM facilitates convenient communication between hospitals and international patients, allowing for remote consultations, appointment scheduling, and updates on promotions and services. The research by Ediansyah et al. (2023) provides evidence that resource integration and networking capabilities enhance hospital performance. Also, the adoption of MT in Malaysia is primarily influenced by human and technological factors, as revealed in the study conducted by Nilashi et al. (2019).

This aligns with RBV's foundational principle, indicating that unique and hard-to-imitate resources, like a well-developed SM strategy, can be a sustainable competitive advantage. Applying RBV principles to explore these strategic resources, especially in the MT context, could provide profound insights into their contribution to the competitiveness and overall performance of healthcare providers. These proposals helped us formulate the following hypotheses (H):

H1: The use of SM has a positive impact on the performance of companies providing MT services.

H1.1: The use of SM has a positive impact on the marketing performance of companies providing MT services.

H1.2: The use of SM has a positive impact on the financial performance of companies providing MT services.

2. Indirect effect and integration of social CRM capabilities

With reference to the RBV theory, which posits that a company's performance is determined by the resources at its disposal, numerous studies have measured the direct effect between resources and performance (Alhaji-Husseini, 2022). However, results have been mixed (Liang et al., 2010). Some studies highlight that resources alone may not enhance firm performance without being transformed into distinctive capabilities. Recent research (Sun et al., 2021) introduces a mediating variable, 'organizational capability' (Liang et al., 2010), between resources and performance. It should be noted, therefore, that the main argument is based on the idea that information technology resources help to improve organizational capabilities, which in turn help to improve firm performance (Ricciardi et al., 2018).

According to Fraccastoro et al. (2021), small and medium-sized enterprises utilizing digital technologies, including SM, need to enhance their capabilities to become more competitive. Previous marketing research has emphasized the importance of updating the resources that the firm has and using their capabilities effectively in creating a competitive advantage (Ramon-Jeronimo et al., 2019). RBV theory has also been introduced to identify a series of marketing capabilities that can generate competitive advantages for firms. Among these capabilities, CRM capabilities have been identified by researchers (Foltean et al., 2019) as a key driver of business performance. This concept arises from evolving consumer expectations on social media, driving businesses to enhance customer-company interactions through new technologies and capabilities (Andzulis et al., 2012). By analogy, in the case of SM, SCRM capabilities, while being a one-dimensional concept (Srinivasan & Moorman, 2005) have been defined as the skills a company possesses for developing, integrating and responding to information gathered from customers interacting on SM (Trainor et al., 2014).

According to Harrigan et al. (2020), SCRM leverages SM technologies and the intrinsically relational characteristics of social platforms to oversee and advance customer relationships, embodying an evolved CRM strategy. In line with this perspective, SM technologies need to be integrated with CRM processes to form a firm-level capability that will be able to influence performance (Marolt et al., 2022). Foltean et al. (2019) employed a mixed sample comprising both B2B and B2C participants, consisting of 149 respondents, demonstrating a positive correlation between the use of SM technology and CRM capabilities. Ye et al. (2022), also, point to the positive and significant correlation between the adoption of SM technology or information systems and organizational capabilities. This supports the idea that leveraging SM positively influences SCRM capabilities, evident in three dimensions: information generation, dissemination, and responsiveness (Zouaoui, 2021). Hence, the following hypothesis is formulated:

H2: The use of SM has a positive impact on SCRM capabilities.

The contribution of marketing capabilities in improving business performance has been widely supported in the literature with empirical evidence (Ediansyah et al., 2023). Al Karim et al. (2023) show that CRM can boost customer satisfaction and enhance overall business performance, both financially and non-financially. Therefore, integrating social media with existing CRM processes allows organizations to potentially enhance their performance (Trif et al., 2019). By leveraging CRM through social media, businesses can boost their performance by increasing consumer engagement, facilitating interactions, and encouraging information exchange (Elshaer et al., 2024). Several researchers have also pointed to the main benefits of SCRM, particularly in building trust, collecting customer information, retaining customers, improving the company's reputation, and lowering the cost of services (Khan et al., 2022; Jalal et al., 2021). Furthermore, the application of CRM by companies contributes to improved financial results (Al-mashahedi et al., 2021). It allows for the maintenance of long-term relationships with customers, thus leading to increased customer loyalty, profitability, and sales (Pratiwi & Arsyah, 2021; Subhani, 2019). By similarity, Sari et al. (2024) demonstrated that the use of SCRM has a positive and significant impact on the performance of small and medium-sized enterprises. In the same vein, Fathey et al., (2021) suggest that leveraging SM enables small and medium-sized enterprises to enhance their performance through the

development of SCRM. The latter has the potential to enhance the marketing strategy and return on investment of organizations by customizing offers based on the gathering of information and understanding consumer preferences (Jalal et al., 2021). These proposals allow us to formulate the following hypotheses:

H3: SCRM capabilities have a positive impact on the performance of companies providing MT services.

H3.1: SCRM capabilities have a positive impact on the marketing performance of companies providing MT services.

H3.2: SCRM capabilities have a positive impact on the financial performance of companies providing MT services.

3. Market turbulence as a variable moderating the effect of SM use on performance

Market turbulence encompasses shifts in customer requests and expectations, demands, market preferences, and product-production technologies (Arici & Gok, 2023). As per Wu et al. (2003), greater market uncertainty leads to increased adoption of information technology systems, enabling firms to adapt strategies and acquire more market information. This allows companies to adapt themselves to their environments, to react quickly and effectively to changes in customer preferences and demand. In a turbulent environment, firms gain a competitive edge by acquiring resources faster than competitors (Trainor et al., 2010). Often, this translates into improved organizational performance in a technologically turbulent context (Rahim & Zainuddin, 2017). In the same vein, according to Sajilan et al. (2019), market turbulence enhances the impact of Facebook use on financial performance. Furthermore, in a qualitative study of MT professionals, it was found that market uncertainty amplifies the connection between SM use and business performance (Najar & Zaiem, 2018). The MT sector is witnessing high turbulence and uncertainty, especially with changing preferences and the opening of new markets with competitive prices. The dynamic nature of these factors poses challenges for businesses operating in the MT industry, requiring them to adapt swiftly to changing trends, explore innovative strategies, and navigate the complexities of a highly competitive environment. This makes the case for the moderating role of market turbulence in that it increases or diminishes the positive or negative impact of SM use on business performance. Hence, the following hypotheses are formulated:

H 4: Market turbulence moderates the impact of SM use on the performance of companies providing MT services.

H4.1: The impact of SM use on marketing performance is moderated by market turbulence.

H4.2: The impact of SM use on financial performance is moderated by market turbulence.

Bearing on the above proposals, we test the research model in Figure 1.

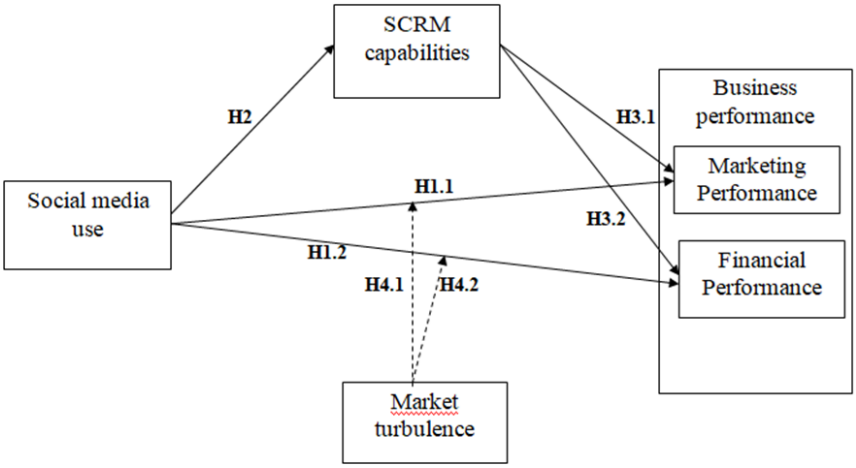


Figure 1. Conceptual model

METHODOLOGY

A quantitative approach was employed, involving the administration of an online questionnaire to gain deeper insights into the impact of SM use on the performance of companies in the MT sector. In addition, the questionnaire aims to determine the indirect effect of this relationship through the SCRM capabilities. It also aims to measure the moderating impact of market turbulence on the link between SM use and performance.

To operationalize the studied constructs, we adopted Likert-type scales (5 points) ranging from "Not at all agree" to "Completely agree", selected for their psychometric qualities (Frikha, 2019). In particular, our questionnaire includes the scale by Jayachandran et al. (2005) adopted by Trainor (2014) to measure SM use. We choose Srinivasan and Moorman's (2005) scale adopted by Trainor et al. (2013) to measure SCRM capabilities. We also adopted the scale by Sin et al. (2005) to measure company performance. For the moderator variable "market turbulence", we opted for Jaworski & Kohli (1993) scale adopted by Trainor et al. (2010). Scales were double back-translated to assess accuracy with the original version.

A total of 133 respondents participated in the survey. We have opted for convenience sampling to enhance participant ease, availability, and accessibility (Golzar et al., 2022), particularly focusing on professionals in the MT sector in Tunisia, including 67 tour operators and 66 clinics as distinct units. This practical approach streamlines recruitment by leveraging participant diversity and the wide accessibility provided by online channels (Alvi, 2016). The choice of tour operators and clinics is explained by the crucial role played by these two actors in the MT sector (Perera-Gil et al., 2017). Thus, the clinics provide the medical treatments which present the core of the service offer, and the tour operators play a decisive role of intermediary between the tourist-patients and the health providers.

The SEM, which favors an estimation approach via PLS (SmartPLS3 software) was chosen for several reasons. First, given the objective of estimating and assessing a theoretical model with a relatively small sample size, variance estimation-based methods appear to be more appropriate (Hair et al., 2021; Reinartz et al., 2009; Chin & Newsted, 1999).

The study adopted a two-step structural equation modeling (SEM) approach to test the proposed hypotheses. First, a confirmatory factor analysis (CFA) was conducted to ensure the reliability and validity of the measurement model. Once these requirements were met, SEM was applied to test the full set of hypotheses across the entire sample.

Further, a multi-group analysis is then used to examine the similarity and difference between tour operators and clinics in the hypothesis model, as our sample is structured into two groups that belong to the same sector of activity (MT) but differ in their type of activities. To this end, two groups are formed on the SmartPLS software according to the variable "type of activity" and we then proceeded to a non-parametric test through a multi-group analysis (PLS-MGA).

RESULTS AND DISCUSSION

Estimation of the measurement models confirms the acceptable psychometric qualities of the set of measures (Table 1). The composite reliability coefficients are all above 0.7 meeting the adopted thresholds (Hair et al., 2021). AVEs are all above 0.5, indicating good convergent validity of the constructs (Hair et al., 2021). The square root of AVEs is higher than correlation between the latent variables (Hair et al., 2021; Henseler, 2016). Factor loadings of constructs are higher than cross loadings of other latent variables, attesting thus for discriminant validity.

Table 1. Result of convergent validity

Constructed	Number of Items	CR	AVE
Social media use	5	0.9379	0.7514
SCRM capabilities	3	0.8723	0.6981
Marketing performance	3	0.9616	0.8931
Financial performance	4	0.9426	0.8047

A bootstrap was used to estimate the structural model (Hair et al., 2021) which is found to have a good goodness of fit. All models have a good goodness-fit above 0.26 (Wetzels et al., 2009) except for SCRM capabilities which has a poor goodness-fit. All Q2 values are positive (Table 2) (Hair et al., 2021). The GOF fit index gave a value of 0.6012, indicating a very good model fit (Wetzels et al., 2009).

Table 2. Model fit

Latent construct	R2	Q2
SCRM capabilities	0.0209	0.0617
Marketing Performance	0.6151	0.5812
Financial Performance	0.4652	0.3085

Estimation of the structural model pointed to significant effects that can be used to test our hypotheses (Table 3).

Table 3. Hypotheses Testing

Hypothesis	Regression coefficient	T test	Hypothesis
H1.1: SMuse -> MkgPer	0.212	(1.680; 0.10)	supported
H1.2: SMuse -> FinPer	0.208	(1.380; 0.10)	not supported
H.2: SMuse -> SCRMcap	-0.144	(1.001; 0.10)	not supported
H3.1: SCRMcap -> MkgPer	0.374	(5.491; 0.10)	supported
H.3.2: SCRMcap -> FinPer	0.469	(4.668; 0.10)	supported
H4.1: Market turbulence * SMuse -> MkgPer	0.139 (f^2= 0,043)	(2.315; 0.10)	supported
H4.2: Market turbulence * SMuse -> FinPer	0.124 (f^2= 0,029)	(1.793; 0.10)	not supported

In our study, we chose to use a one-tailed test to assess specific hypotheses. Our proposition suggests that the use of SM and the capabilities of SCRM positively impact performance. In other words, we contend that performance would significantly improve after the intervention of SM and SCRM. The partial validation of the first hypothesis (H1) shows that the use of SM positively affects the marketing performance of companies operating in the MT sector. This funding, in accordance with Salloum et al. (2019) study based on research conducted in Jordan, indicates that SM, especially Facebook, has a positive impact on destination tourism marketing. Indeed, Jordan's MT marketers must focus on key factors influencing destination marketing through SM, particularly Facebook (Alghizzawi et al., 2019).

Similarly, according to Tat-Huei et al. (2020), SM significantly impacts the image of Malaysia as a MT destination. This influence extends to perceived value and the intention to revisit. Therefore, these media platforms serve as an extensive and effective means to market healthcare facilities and attract medical tourists, as highlighted by Sankar and Kannan in 2020. Indeed, several authors claim that the use of these technologies improves the performance of MT establishments (Kim, 2016), builds trust (Haudi et al., 2022) and promotes loyalty (Abbasi et al., 2022). Ugli & Um (2023) highlight the crucial role of SM marketing in minimizing perceived risks and enhancing satisfaction among international medical tourists. Nevertheless, the findings indicated that the adoption of these technologies by professionals in MT does not substantially influence their financial performance.

This can be explained by the fact that the impact on financial performance is not immediate, as tangible results from SM marketing campaigns may take time to materialize. Certainly, as noted by Paniagua & Sapena (2014), the advantages of SM for business performance are not immediate and tend to be realized over the long term. Tunisia's unique characteristics in the MT industry may influence how SM usage affects financial outcomes, considering industry-specific nuances. We also hypothesized that the use of SM positively affects SCRM capabilities (H2) and that these have a positive impact on the performance of companies operating in the MT sector (H3.1 and H3.2). This means that SCRM capabilities act as a mediating factor in the relationship between SM use and the performance of MT service providers. This mediating effect is not confirmed in our study, as the second condition of the mediating effect (Baron & Kenny, 1986), namely Hypothesis (H2), is not validated. This result contradicts with the findings of Guangming & Jay (2023), who assert the presence of an indirect influence of SM use on marketing performance through CRM capabilities.

Furthermore, several studies have affirmed the significance of the relationship between SM use and capabilities (e.g., Ye et al., 2022; Marolt et al., 2022). While some argue that capabilities mediate the link between resources and performance, others like Mishra et al. (2019) question this perspective, possibly due to unique study contexts in the MT sector where many professionals don't define a specific strategy for SCRM. Another explanation for the lack of mediation is possibly the presence of a direct effect between the use of SM and performance. In summary, a combination of factors related to the industry, implementation, evolution of SM, and local context could account for this divergence from previous studies. The validation of hypothesis (H3) supports the notion that SCRM capabilities contribute to enhancing the marketing and financial performance of MT companies. Indeed, while the specific mediating effect of SCRM capabilities has not been confirmed, this does not rule out the possibility that they have a direct positive impact on performance. These results may reflect the complexity of relationships in the specific context of MT. Additionally, the benefits of SCRM capabilities may evolve over time, with the mediating effect potentially requiring an extended period to become evident. This finding aligns with the conclusions drawn by Al-Gasawneh et al. (2021).

Certainly, by fostering greater interaction between social technologies and CRM processes, the potential positive impacts of SCRM capabilities on both customer satisfaction and financial performance of companies can be significantly heightened (Ngo et al., 2021). This outcome implies that SCRM capabilities have a positive influence on customer satisfaction and loyalty (Trainor et al., 2014) and drive increased profitability (Aljabhan, 2023). Validation of hypothesis (H4) highlights the moderating effect on the link (H1). This result aligns with the findings of Arici and Gok (2023), demonstrating that market turbulence intensifies the positive relationship between the company's innovation and its performance. Chong et al. (2015) also identified a moderating influence on the association between e-marketing services and e-marketing performance. This effect is relatively important in the MT sector which is considered to be very dynamic, allowing tourists-patients to have a wide range of choices of services (Najar & Zaiem, 2018). This variety pushes professionals in the sector to improve their use of SM in order to gain the trust and satisfaction of their customers.

Multi-group analysis

A non-parametric test through a multi-group analysis (PLS- MGA) showed a difference between the two groups (gp1: tour operators; gp2: clinics) in four relationships (Table 4). Indeed, tour operators integrate more SCRM capabilities in their use of SM, which allows them to improve their performance. This can be explained by the fact that tour operators may have a more pronounced commercial orientation than clinics, leading them to place greater importance on managing customer relationships on SM to attract and retain clients. Additionally, as intermediaries, tour operators may emphasize customer relations to ensure an overall positive experience. Indeed, it has been shown that SCRM helps to identify the interests of potential customers, increase the number of tourists and establish good relationships with them, in particular, through the collection and dissemination of tourist information stored and communicated on Facebook and Instagram (Ibrahim et al., 2021). In contrast, clinics are more sensitive to market turbulence. It implies that the impact of SM on performance can vary depending on market turbulence levels. In unstable market conditions, this relationship may be influenced differently compared to more stable conditions.

Table 4. Multi-group analysis (Tour-operators vs Clinics)

Relationships	Difference between Path of gp 1 and gp 2 (eigenvalues)	Value-t gp1 (tour-operators)	Value-t gp2 (Clinics)	Value-p gp1 vs gp2
H1.1: SMuse -> MkgPer	0.061	0.990	0.479	0.576
H1.2: SMuse -> FinPer	0.046	0.544	0.745	0.578
H.2: SMuse -> SCRMcap	0.597	**2.029**	**0.730**	**0.949**
H3.1: SCRMcap -> MkgPer	0.467	**6.986**	**1.446**	**0.000**
H.3.2: SCRMcap -> FinPer	0.602	6.998	3.504	0,000
H4.1: Market turbulence * SMuse→ MkgPer	0.264	**0.201**	**2.288**	**0.979**
H4.2: Market turbulence * SMuse -> FinPer	0.221	**0.356**	**1.793**	**0.954**

CONCLUSIONS

Studies addressing the influence of SM and SCRM capabilities in the MT sector are very limited, especially those examining this effect from a business perspective rather than a consumer perspective.

Therefore, this study builds upon these gaps by examining the effects of SM use on MT companies' performance and investigating the boundary condition and underlying mechanism explaining this effect.

This is accomplished through conducting a quantitative study about the impact of using SM specifically through SCRM capabilities on enhancing the business performance of providers in Tunisia's MT industry. Based on 133 questionnaires collected from clinics and tour operators, and using PLS-SEM, this study reveals the partial impact of SM utilization on the business performance of these entities, particularly in relation to their marketing performance. Likewise, the findings suggest that SCRM capabilities do not serve as a mediating factor in the relationship between SM use and the performance of MT service providers. In contrast, tour operators are more inclined to integrate SCRM capabilities into their SM strategies, enabling them to enhance their overall performance. Regarding clinics, they demonstrate greater responsiveness to the moderating impact of market turbulence.

The methodological choice to examine the impact from a business perspective, rather than a consumer perspective, indicates the importance of considering the viewpoint of industry providers. Researchers interested in understanding the business implications of SM in other sectors may benefit from adopting a similar methodological approach to ensure relevance to industry stakeholders. Moreover, the study's comparison between clinics and tour operators indicates opportunities for cross-sector research. Researchers can benefit by investigating the impact of SM and SCRM capabilities across different sectors, tailoring methodologies to sector-specific characteristics.

5.1. Managerial implications

Managers in the Tunisian MT sector can use the findings to fine-tune and optimize their SM strategies, with a particular focus on enhancing marketing performance. This may involve revising content, promotional tactics, and online community interactions to maximize benefits. On the other hand, recognizing that tour operators in Tunisia seem to gain significant advantages from utilizing SCRM capabilities, managers may consider targeted investments in these capacities. This could involve staff training, adopting specific technologies, and developing processes to strengthen customer relations through SM. Furthermore, in unstable market conditions, the relationship between the use of SM by Tunisian clinics and their performance may be influenced differently compared to more stable conditions. This nuance highlights the importance of adjusting SM strategies to the specific economic and competitive context during each period of market turbulence.

5.2. Research limitations and future research directions

This research is not exempt from limitations. The context-specific nature of MT in Tunisia and the dynamic nature of SM may constrain the generalizability of the findings. For future research, it would be valuable to explore international comparisons, adopt a longitudinal approach to track the impact of SM over time, and investigate the role of cultural differences. Expanding the sample to include other stakeholders, such as hotels or guesthouses and integrating control variables like the strategy for exporting medical services or company size could improve the generalizability and robustness of the research. Additionally, introducing moderating or mediating variables such as "cultural factors" (Jursé et al., 2019) would enrich the research model. These avenues could significantly enhance the understanding of SM strategies in MT and contribute to their evolution.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

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THE REALITY OF AGROTOURISM AND THE CHALLENGES OF LOCAL DEVELOPMENT IN BOUMERDES PROVINCE: FOUNDATIONS AND OPPORTUNITIES FOR SUSTAINABLE AGRICULTURAL DEVELOPMENT

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Abstract: Agriculture plays a pivotal role in ensuring food security and providing employment opportunities, while tourism is a strategic element in economic development, especially in resource-rich countries like Algeria, which boasts unique tourism potential with its 1,600 km coastline, mountain ranges, and vast deserts. The integration of agriculture and tourism, particularly through agro-tourism, has become a key approach to achieving sustainable development in both sectors. This study focuses on agro-tourism in Algeria, with a particular emphasis on olive oil tourism, using the "Kiard" olive oil mill in Baghlia, Boumerdes, as a model, which has become a prominent tourist destination. The study relies on field data collection through visits to relevant institutions such as the Ministry of Agriculture, the National Institute for Fruit Trees, and the Kiard Olive Oil Mill. Data analysis was conducted using the Geographic Information System (GIS) through ArcGIS software, allowing for the mapping of the tourism potential of this agricultural site. The results highlight the significant potential of the olive and olive oil sector in attracting both local and foreign visitors interested in traditional products such as olive oil waste-based soap, natural cosmetics, and local dishes prepared with locally produced olive oil. This agro-tourism model not only helps preserve traditional agricultural activities but also contributes to the region's economic development. The study also emphasizes the need for investments in tourism infrastructure, as well as the adoption of scientific and strategic management to ensure the sector's sustainability. Additionally, farmers and rural communities directly benefit from these tourism activities, providing them with alternative sources of income and enhancing social sustainability. In conclusion, olive oil tourism, as part of agro-tourism, represents a promising sector for sustainable rural development in Algeria. However, strengthening this sector requires effective management and targeted investments to maximize its positive impact on the local economy while preserving the region's natural and cultural heritage. With appropriate policies and collaboration between the agriculture and tourism sectors, Algeria can enhance its position in both fields.

Keywords: agro-tourism, sustainable agricultural development, rural development, agricultural tourism activities, olive oil mills

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INTRODUCTION

The agricultural sector is a vital one, playing a fundamental role in providing food for the population and creating job opportunities for a wide range of society (Hayami & Ruttan, 1971). At the same time, the tourism sector is considered a strategic one for economic development in any country, especially when natural and human resources are available to support and develop it. In this context, Algeria is one of the countries with outstanding natural tourist potential, possessing over 1,600 km of coastline, diverse mountain ranges, and a desert that is a year-round attraction for foreign tourists (Bouziane & Hassan, 2015; Yusoff et al., 2019). Therefore, enhancing the integration between the agricultural and tourism sectors is an urgent necessity that requires attention and serious efforts to achieve. Developing Agro-tourism or tourism agriculture is an important topic due to the opportunities it offers for the development of both sectors together (Boiko et al., 2020; Sobaih et al., 2024). Recently, Algeria has started adopting some tourism activities in agricultural areas, both in the north, which is rich in natural resources, and in the vast south, where tents, services, and traditional meals are provided (Rabehi et al., 2023). Some farm owners have transformed parts of their farms into tourist destinations for families seeking relaxation, comfort, and an escape from urban life pressures. These spaces offer an ideal environment for children to enjoy playing and rejuvenating, adding a healthy and recreational dimension to the experience.

Notably, these farms promote local and traditional products as a means of financial support. These products include cheeses, fresh healthy foods, as well as animal breeding such as horses, rabbits, ducks, sheep, and goats. These activities represent an encouraging model for preserving agricultural activity while providing simple means that enhance its tourist appeal. In this way, economic and social sustainability is achieved without compromising the traditional agricultural character of the farm (Janker et al., 2019). The Baghlia Olive Press is considered a successful model for the integration of agriculture and tourism. The owners have equipped the facilities to include parking lots and shops displaying traditional products such as

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soap made from olive oil waste, natural cosmetics, pottery, wooden utensils, and traditional food products like different types of couscous made from wheat, barley, and acorn flour, which are prepared by rural women as a source of income.

During our visit to the area, we noticed a large influx of visitors to the press, even outside the olive oil pressing season, whether from locals or from the Algerian diaspora with their foreign friends. They were drawn to the press not only for the high-quality olive oil but also for the traditional products available, and for tasting dishes that include the locally-produced olive oil, such as couscous. We chose to study an agricultural tourism model represented by the olive press, specifically the Kiard & Baghlia presses, which have become prominent tourist destinations. Baghlia Press, for example, is strategically located between highlands and valleys, with a picturesque nature adorned by olive trees. This press has received local and international medals for the quality of its olive oil, making it a popular destination for both locals and foreign tourists.

Through this research paper, we aim to study the distribution of olive trees in the Province of Boumerdes, as well as the production of olives and olive oil. The study seeks to highlight the significance of certain field activities that can contribute to the optimal utilization of cultivated areas and the preservation of land productivity. Additionally, it explores mechanisms to expand agricultural activities and protect agricultural lands. Agritourism, particularly olive oil tourism or mill tourism. is a key topic deserving attention. The research problem focuses on studying agricultural activities that help preserve the agricultural character of the land, especially those that can stimulate development in agricultural and rural areas. These activities require scientific monitoring and guidance to develop effectively.

Such activities rely on the influx of visitors to agricultural areas, necessitating the scientific and well-planned preparation and management of these spaces. The study focuses on the potential of olive and olive oil production and raises the following question: Can agritourism, specifically olive oil tourism or olive mill tourism, be organized in the Province of Boumerdes as a model applicable on a national level? The study is based on a model of olive farming, olive production, and olive oil production in the Province of Boumerdes, with a particular focus on the Kiared mill, which produces virgin olive oil in the Municipality of Baghlia, as a practical case study.

LITERATURE REVIEW

The tree, particularly the olive tree, stands as a profound symbol of identity and belonging, embodying resilience and the enduring bond between humans and nature (Abufarha, 2013). In his writing, Mouloud Mammeri presents a vivid depiction of the close relationship between humans and the olive tree, which he perceives as a reflection of human characteristics themselves. The olive tree is not merely a plant; it is an integral part of the daily life and historical memory of Mediterranean peoples. It possesses a remarkable ability to adapt to harsh weather conditions, unlike other trees that grow skyward, remaining steadfast with deep roots that defy adversity. According to Mammeri, the olive tree is a "climatic tree," meaning it has the innate capacity to withstand and thrive in the face of drastic environmental shifts. The olive tree, he observes, "bears fruit only in winter," (Abufarha, 2013) when the majority of other trees have given up to the cold. The fruit's harvest, which symbolizes tremendous effort and sacrifice, becomes a celebration under these difficult circumstances. He also emphasizes how the olive tree represents memory and history, with some old trees displaying signs of aging in their trunks, much as how collective memory is transmitted to the next generation.

Like people, olives tend to be resilient and reject ease. Under these circumstances, the olive tree becomes a representation of perseverance and resistance, a mark of ancestry, and the close connection that exists between people and the land they live on. It is more than simply a tree; it is a part of a lengthy history that attests to the struggles and victories that people have faced throughout the years. As agro-tourism has grown in Mediterranean nations (Bramwell, 2003), "olive oil tourism" has become a popular word for showcasing local traditions and agriculture. Olive oil tourism is a type of agritourism that lets tourists spend time in fields and farms surrounded by olive trees while engaging in farming and agricultural production-related activities. This kind of tourism is growing significantly in several nations where farms have the infrastructure to receive tourists, boosting farm owners' profits while promoting agricultural goods.

Over the past decade, olive tourism has gained significant attention among researchers, leading to the publication of both theoretical and empirical studies. Initial research was conducted in Australia (Northcote & Alonso, 2011)before expanding to Europe. Olive tourism is defined as a set of activities centered around olives, olive oil, olive trees, and their related heritage (Kouri, 2024). According to Salvado & Monteiro (2024), this tourism sector not only offers various activities but also provides immersive experiences, emotions, and sensations linked to olive oil and the specific production conditions of each region. Dancausa Millán & Millán Vázquez de la Torre (2024) define olive oil tourism as a form of tourism that establishes strong connections between culture, nature, and gastronomy.

Olive tourism has been studied from multiple perspectives. Pulido-Fernández et al. (2019) attempted to structure the main scientific contributions based on the synergies between olive tourism and other tourism sectors, including gastronomic, industrial, rural, and cultural tourism. Gastronomy plays a crucial role in tourism by enabling visitors to engage with local culture (Pulido-Fernández et al., 2019). Local products facilitate cultural exchange and knowledge transfer between local artisans—who act as guardians of regional traditions and identity—and residents, fostering an exceptional medium for cultural exchange (Millán-Vázquez de la Torre et al., 2017). As a result, gastronomy is considered a fundamental pillar of olive tourism activities in rural areas (Pato, 2024). Furthermore, olive tourism has emerged as a practice similar to wine tourism, with notable similarities between the two. Both focus on promoting the host region, bringing tourists closer to nature, and offering insights into rural and agricultural traditions (Pahari, 2024).

On a small but discernible scale, this kind of tourism has started to appear in Algeria. An increasing number of families and individuals are growing olive trees and making olive oil. However, this expansion is beset by issues of inadequate planning and organization. Our research paper examines the distribution of olive trees and how they produce the best olive

oils. It uses the Baghlia mill for extra virgin olive oil production as a case study to emphasize the significance of these agricultural endeavors, which may help Algeria's agritourism industry grow.

Algeria has a considerable edge in drought adaptation thanks to the more than 48 types of olive trees that are currently listed in the official catalog. A number of olive varieties, including Chemlal, Azzeradj, Sigoise, and Limli, are grown in the Province of Boumerdes (Benadjal et al., 2022). With over 45% of Algeria's olive history coming from Chemlal, it is the most prevalent local variety. The self-pollinating Sigoise cultivar, which serves several purposes and accounts for 20% of Algeria's national olive orchards, is mostly grown in western Algeria. Chemlal is frequently paired with Bouchouk and Azzeradj, both of which are used for oil production and canning, and Azzeradj improves pollination. Limli, which is grown in the western Soummam region, makes about 8% of the country's olive orchards. Rouget de Mitidja, on the other hand, is cultivated mainly for oil production in the foothills of the Atlas Mountains and the Mitidja plain (Bachouche et al., 2024; Rouibah & Belabbas, 2022). Rouget de Guelma and Blanquette de Guelma are also common in the country's eastern regions, frequently living together in the same space. These types are vital to Algerian agriculture, helping to increase both the sustainability and diversity of the sector. Although agrotourism, or farm tourism, has long been a popular tourism practice in rural areas, the agrotourism offer appears relatively vague (Lesauvage, 1995). In recent years, a number of organizations associated with the agricultural world have attempted to define the issues surrounding agrotourism (Bourdeau et al., 2002), but the different perspectives held by farmers and tourism stakeholders on this same economic activity complicate any attempt to propose a synthetic and comprehensive definition of agrotourism . We also note the difficulty of characterizing the agrotourism product. Not only do the definitions used to describe agrotourism activities and products differ from one country to another, but conceptions between the agricultural and tourism communities are sometimes so divergent that it is difficult to obtain a common measure and develop a common statistical portrait of agrotourism (Marcotte et al., 2006).

Olive oil tourism is a recent type of rural tourism; hence, it remains a field of research that is still overlooked. Therefore, it is fitting to provide a quantitative overview of the literature regarding this promising area (Pato, 2024) Olive oil is not only an essential culinary element in the diet of Mediterranean countries, but it is also becoming an increasingly attractive element from a tourism perspective. The olive grove landscape, ancient olive trees, and oil mills are increasingly attracting tourists eager to experience this type of tourism (Dancausa Millán & Millán Vázquez de la Torre, 2024)

Algerian olive growing is considered today as a strategic sector, it plays a very important role in the agricultural sector and has participated in the survival economy of communities over time (Sahli, 2022).

Algeria is one of the countries where the olive oil production is particularly increased in the last ten years, thanks to two agricultural renewal programs, over the 2006–2008 and 2009–2014 periods, allowing producers to update their production tools. In these years, cultivation zones passed from 165,000 to 500,000 ha.

Table 1. Oil production in Boumerdes and Algeria (2002-2021) (Source: Ministry of Agriculture and Rural Development, Directorate of Agricultural Statistics and Information Systems, Agricultural Statistics, "Areas and Production", Series "B" 2002-2021)

Year	Local and National Scale	Oil Production (Hl)	Year	Local and National Scale	Oil Production (Hl)
2002	Boumerdes	5,250	**2012**	Boumerdes	6,655
	Total Algeria	256,000		Total Algeria	429,980
2003	Boumerdes	6,150	**2013**	Boumerdes	30,804
	Total Algeria	165,780		Total Algeria	715,970
2004	Boumerdes	25,760	**2014**	Boumerdes	8,802
	Total Algeria	757,070		Total Algeria	479,700
2005	Boumerdes	25,760	**2015**	Boumerdes	15,403
	Total Algeria	379,170		Total Algeria	758,892
2006	Boumerdes	10,800	**2016**	Boumerdes	19,311
	Total Algeria	349,920		Total Algeria	889,662
2007	Boumerdes	12,040	**2017**	Boumerdes	9,102
	Total Algeria	238,170		Total Algeria	685,425
2008	Boumerdes	5,946	**2018**	Boumerdes	23,603
	Total Algeria	261,260		Total Algeria	898,375
2009	Boumerdes	27,612	**2019**	Boumerdes	5,688
	Total Algeria	669,765		Total Algeria	1,053,234
2010	Boumerdes	3,548	**2020**	Boumerdes	30,797
	Total Algeria	288,860		Total Algeria	1,371,317
2011	Boumerdes	30,347	**2021**	Boumerdes	10,834
	Total Algeria	728,050		Total Algeria	783,720

Table 1 and Figure 1 illustrate the trends in olive oil production in the Province of Boumerdes between 2002 and 2021. The analysis reveals considerable fluctuations over this period. While certain years recorded high levels of production, others showed a marked decline. At the national level, olive oil production also experienced similar variability, indicating broader challenges within Algeria’s olive-growing sector. In Boumerdes specifically, the period from 2004 to 2011 was marked by a general upward trend, with significant increases observed in 2004, 2009, and particularly in 2011, which recorded the highest output at 30,347 hectoliters. This indicates improvements in production conditions or agricultural techniques. However, in some years, such as 2010, the Province registered its lowest production level (3,548 hectoliters), possibly due to unfavorable climatic conditions or issues in local agricultural resource management. At the national level, there was a consistent rise in production from 2009 to 2020, especially in 2020, when Algeria recorded its highest production level (1,371,317 hectoliters).

However, Algeria also experienced some declines, particularly in 2003 and 2014, reflecting production variability due to environmental and economic challenges. Overall, it can be concluded that production in Boumerdes is influenced by climate changes and local policies, while national production reflects a general improvement in the agricultural sector despite fluctuations over the years. The objective of this study is to explore the potential of the agricultural sector for rural development, focusing on Agro-tourism as a means to integrate sectors for sustainable development and economic growth in Algeria. More specifically, this research highlights the reality of olive production and olive tourism in the Wilaya of Boumerdès, using the Baghlia oil press as an example of a modern mill that can contribute to the dynamics of rural areas. The study thus aims to revive this activity to promote the development of the agricultural sector and rural territories.

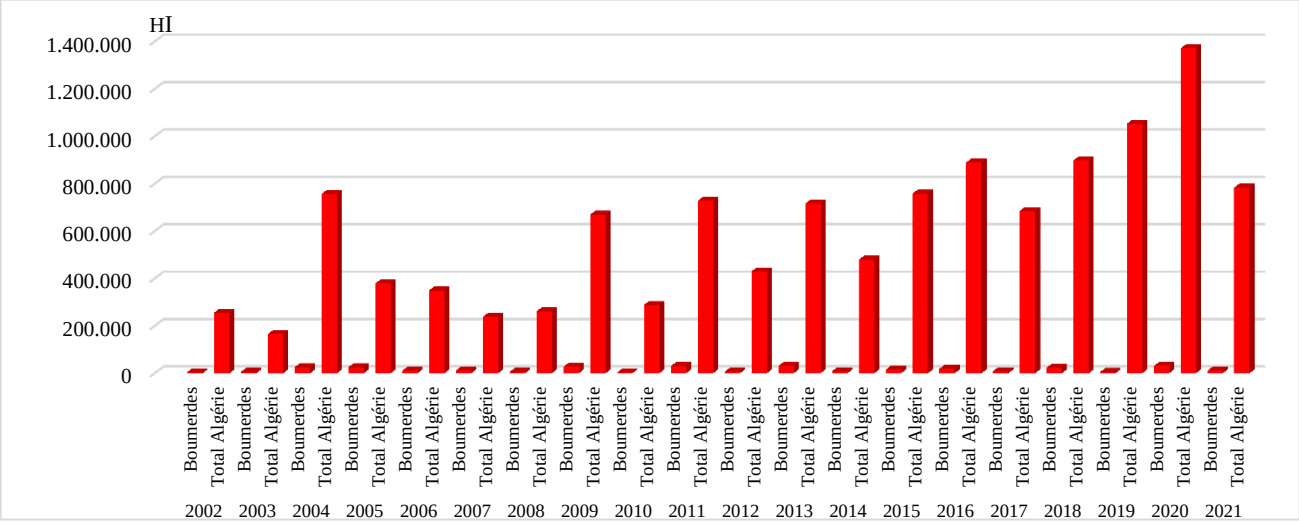


Figure 1. Olive oil production in the Municipalities of Boumerdes and Algeria (2002-2021) (Source: MADRP, 2024)

MATERIALS AND METHODS

The study was based on descriptive and analytical methods to project design models corresponding to natural tourist sites.

After examining the potential of olive and olive oil mills in Boumerdes, in coordination with representatives from tourism and agriculture, we identified significant opportunities for investment in tourist facilities and attractions within the Beghlia oil mill. Many tourist points and suggestions were discussed and approved to reveal the true potential of this exceptional oil mill and the various capacities it can offer to tourism in the region.

We utilized the ArcGIS program for mapping the different sites and locations, providing detailed visual representations of the area's tourism potential. Additionally, field data was collected through visits to the Ministry of Agriculture, the National Institute for Fruit Trees, and Kiard Olive Oil Press in Baghlia. Geographic Information Systems (GIS) were used to map and analyze the collected data. The study highlights the promising potential of Agro-tourism in Algeria despite limited research in this field, stressing the need for further studies to support and enhance this sector's role in the local economy (Figure 2).

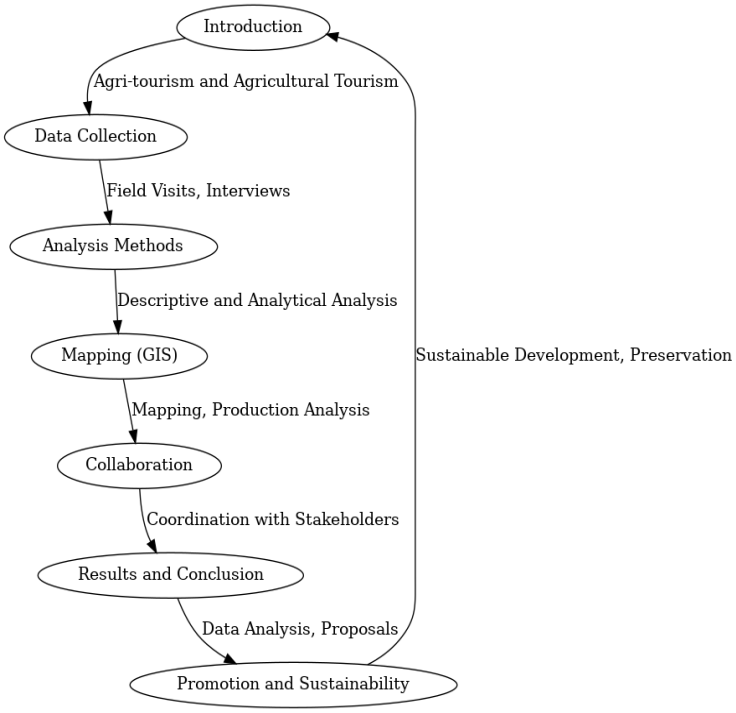


Figure 2. Framework for Promoting Agro-tourism and Agricultural Sustainability (Source: Author, 2025)

Presentation of study area

The province of Boumerdes is a coastal city in central Algeria, covering an area of 1,456.16 km² with a 100 km coastline. Province of Boumerdes is bounded to the north by the Mediterranean Sea; to the south by the province of Bouira; to the west by the provinces of Algiers and Bouira; and to the east by the province of Tizi Ouzou (Figure 3 and 4). Its topography consists of plains and valleys in the north, hills and plateaus in the central part and mountains in the south. Boumerdes has a Mediterranean climate, with cold, wet winters and hot, dry summers.

Rainfall is irregular, varying between 500 and 1,300 mm/year. The Dellys region receives more rainfall than the rest of the province, with an average of 900 mm/year.

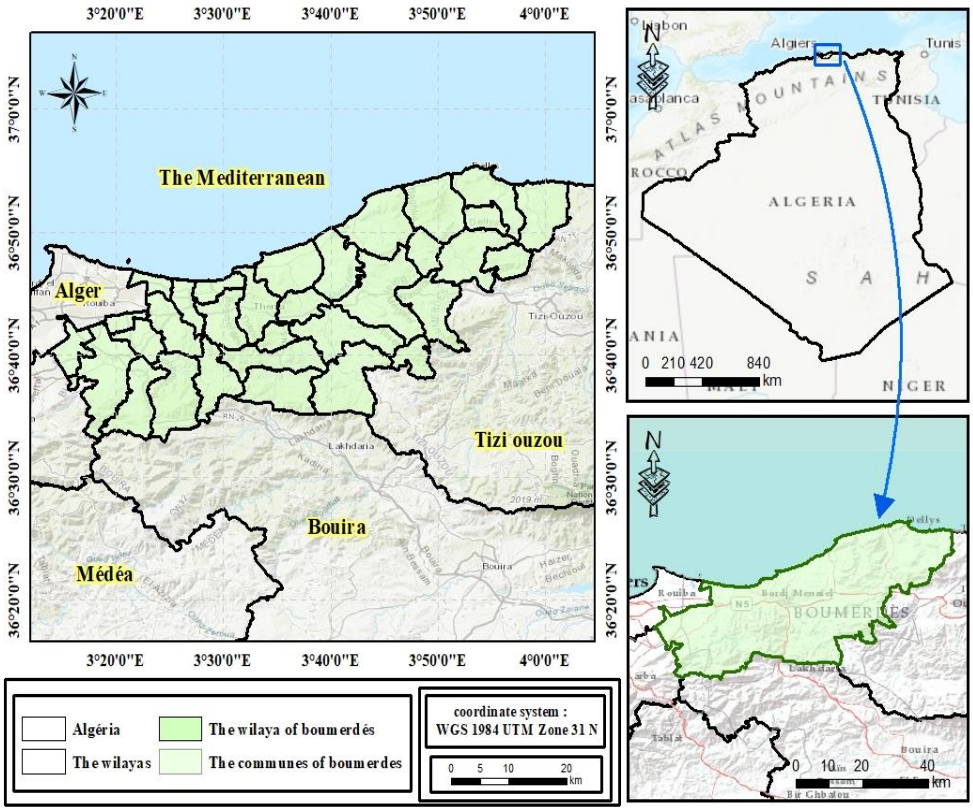


Figure 3. Geographical location of province of Boumerdes (Source: Authors, 2024)

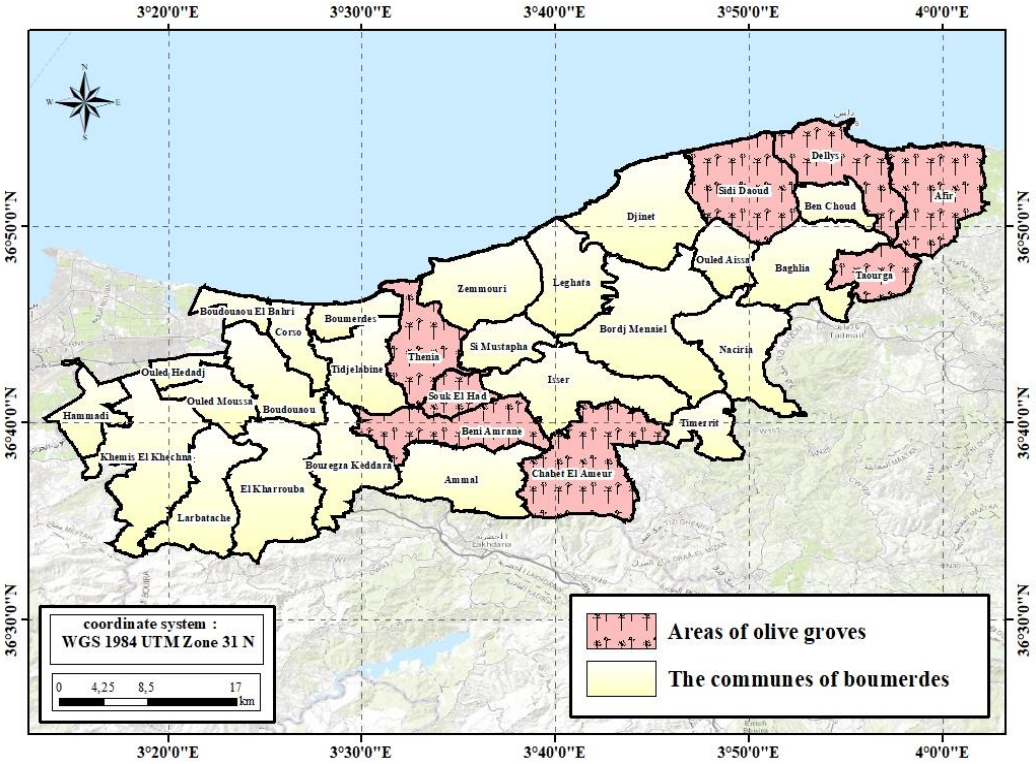


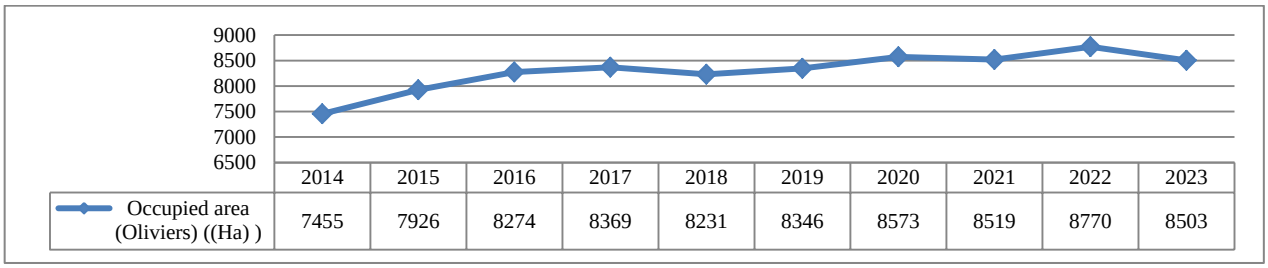
Figure 4. Repartition of olive groves in the province of Boumerdes (Source: Authors, 2024)

RESULTS

Cultivation of olive oil in Boumerdes

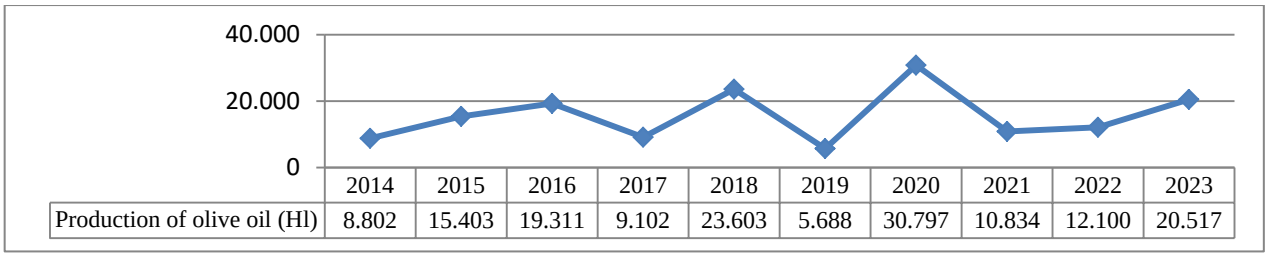
The true origin of the olive is not known but is speculated to be Syria or possibly sub-Saharan Africa. For more than 6000 years, the cultivated olive has developed alongside Mediterranean civilizations and is now commercially produced on more than (9.4 million ha) in the Mediterranean basin (Vossen, 2007). The area of olive trees in the province of Boumerdes has increased by 46% over the last two decades. At present, the province's olive orchard covers 8,770 ha, compared with 5,700 ha in 2000, representing an increase of 46% (DSA, 2023). This area includes no fewer than 1,046,000 olive trees,

88% of which are productive, spread over family orchards with an average of 110 olive trees per orchard. The increase in the surface area of the local olive orchard has been achieved thanks to government programs aimed at diversifying agricultural production and reducing vineyard production, which accounts for almost 40% of the province's utilised agricultural area (UAA). The province's olive groves are concentrated mainly in the mountainous areas of Beni Amrane, but also in the regions of Thenia, Afir, Taouergua, Souk El-Had, Chaâbat El Ameur, Dellys and Sidi Daoud (Figure 4). Development programs implemented in the sector have included the reforestation and rehabilitation of 1,000 hectares annually as compensation for farmers affected by fires and adverse weather conditions. During the same period, 269 hectares of olive trees were also planted as part of local initiatives. From 2016, olive cultivation was expanded, reaching 8,870 hectares in 2022, see Figure 5.



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Occupied area (Oliviers) ((Ha))	7455	7926	8274	8369	8231	8346	8573	8519	8770	8503

Figure 5. The area occupied by olives (Ha) in Boumerdes (Source: Authors based to Agricultural Directorate of Boumerdes, 2023)



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Production of olive oil (Hl)	8.802	15.403	19.311	9.102	23.603	5.688	30.797	10.834	12.100	20.517

Figure 6. Production of olive oil Hl in Boumerdes (Source: DSA Boumerdes, 2023)

According to the Agricultural Directorate of Boumerdes (2023), the area dedicated to fruit trees exceeded 20% of the total agricultural land. On the other hand, the total area of olive trees constitutes more than half of the area dedicated to fruit trees, highlighting the significant importance of this agricultural crop in the mentioned years. This is further evidenced by the notable increase in olive cultivation in recent years. After 2014, the province of Boumerdes has produced an average of 10,000 hectoliters of olive oil annually. This increase in oil production is the result of the expansion in the cultivation of olives intended for pressing. Consequently, production reached 30,797 hectoliters in 2020(Figure 6).

The above (Table2) and (Figure 4) indicate that here is a valuable production of oil olive in the last years with certain perturbations; the last one is controlled by several factors, the most important of which is the natural factor.

Table 2. Olive oil production in the Province of Boumerdès (Production Olives to oil) (Source: DSA Boumerdes, 2023)

Municipality	**Total (Qx)**	Municipality	**Total (Qx)**
Dellys	630	B-menaiel	2,275.2
Thenia	3,064	Boudouaou el bahri	0
Ben choud	390	Cap djinet	995.52
Souk elhad	3,561.5	O-heddadj	0
Afir	10,230	Zemmouri	1,126.65
Beni amrane	23,432	Kharrouba	4,284
Baghlia	4,230.09	Legata	1,361.50
Ammal	10,065	Keddara	4,500
Sidi daoud	3,130.65	Isser	5,641
Boumerdes	153	Kh el khechna	2,923
Taourga	17,474.40	Chabet	37,978.75
Tidjelabine	833	Hammadi	109
Naciria	1,800	Si mustapha	3,837.50
Corso	272	O-moussa	158
O-aissa	3,275	Timezrit	9,790
Boudouaou	414	Arbatache	2,140.5
Total province		160,075.26	

The data shows that the municipality of Chabet leads the list of municipalities in terms of olive oil production, with production quantities reaching 37,978.75 tons. This reflects a high production capacity for this area compared to other municipalities. It is followed by the municipality of Beni Amrane with a production of 23,432 tons, and then the municipality of Taourga, which produced 17,474.40 tons. On the other hand, there are other municipalities showing very low production levels, such as Boumerdes, which recorded only 153 tons, and O-Moussa with 158 tons, while municipalities like Boudouaou El Bahri and O-Heddadj reported no production. These large differences in production levels

indicate disparities in production capacity between municipalities, with some being able to exploit their agricultural resources more effectively. The total olive oil production in the Province reached 160,075.26 tons, highlighting the large volume of production but also emphasizing the need to improve production practices in municipalities with low output (Figure 7).

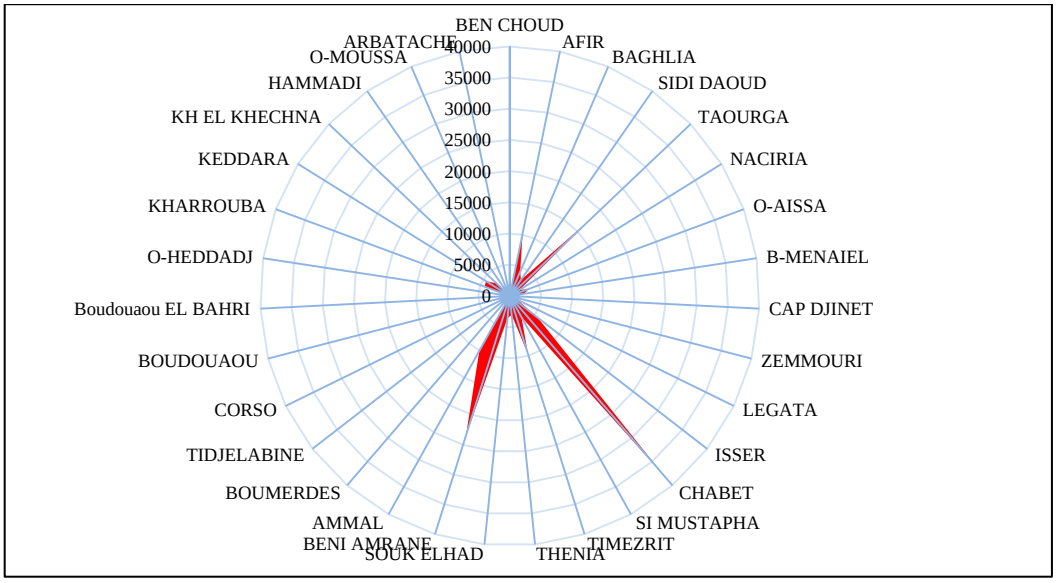


Figure 7. Olive oil production in the Province of Boumerdes region (Source: DSA Boumerdes, 2023)

Olive oil mills of Boumerdes

The province of Boumerdes is keen to promote the development of rural tourism in the coming years. To this end, the local branch of the pilot action program for agricultural and rural development in Algeria is banking on the "Olive Road" project. This tourist trail through the countryside will encompass several communes boumerdes. The aim of this touristic route is not only to promote olive oil, the region's emblematic product, but also to promote handicrafts, agricultural and gastronomic products based around the olive tree, which can be described as "organic" and "authentic". The province of Boumerdes encounters nine oil mills throught its territory, just five are functional till today (Table 3). Table 3 reveals the different oil mills the province of Boumerdes englobes,where the mill of Behglia is among the oldest ones in the region, besides it takes the top in the quantity of olives crushed and the production where it produces 400 m³/year.

Table 3. Olive oil mills in the province of Boumerdes (Source: DSA Boumerdes, 2023)

Commune	Name	Year of start-up	Quantity of olives crushed	Production (m³/year)
Taouarga	Laroum hocine	2010	70-80 Q/D	40
	Hadjadj boualem	2021	250 Q/D	100
	Amroun mohamed	1995	30-40 Q/D	9
	Sadaoui hocine	2003	80 Q/D	15
Baghlia	Sarl ets kiared	1997	4000 Q/D	400

Olive oil mill of Baghlia a step toward building a tourist route

Spending a day among olive trees, observing how oil is produced or discovering certain types of olives? Thats what we call olive tourism. This tourism seeks to familiarize you with all the different characteristics, qualities and processes of producing a healthy product like olive oil. The olive oil mill of Baghlia was established in 1997 and is a family-owned press, and it used to press olives for the benefit of the region's customers (the owners of olive groves in the vicinity of the press bring their own olives to be pressed in the press. What should be noted here is that the quality of the oil produced was not good because of the poor quality of the olives loaded for pressing due to transportation conditions and harvesting method where most of the yield is destroyed) The press did not market the oil, but it was delivered to these customers, the pressing process was modern, the problem was in the quality of the oil (Figure 8 and 9).

- In 2009, the equipment was replaced with new, more advanced equipment imported from Italy, and a separate pressing hall, storage and packaging hall was built (i.e. an expansion)

- In 2009, an olive shop was built, which led to changing the strategy of the press to a commercial press, i.e. pressing and selling oil, and taking into account the type of oil in terms of quality (cold pressing, the fruits that are pressed are of good quality and in good condition and go through all stages of modern pressing, washing, sorting and purification, i.e. all stages until they come out in the form of extra virgin oil vierge et extra vierge). The "Baghlia" brand has also won some 30 medals at international tasting competitions over the last ten years, including 10 gold medals and the rest in silver and bronze. The most important of these distinctions is represented by the bronze medal won at the AVPA-Paris 2019 international competition for the world's best olive oils, and the gold medal obtained at the Athens (Greece) international olive oil competition in 2020. The same oil mill also won gold medals at the Japan 2021 international competition, the Dubai 2022 international competition, London 2021 competition and the international Japan Olive Oil Prize.

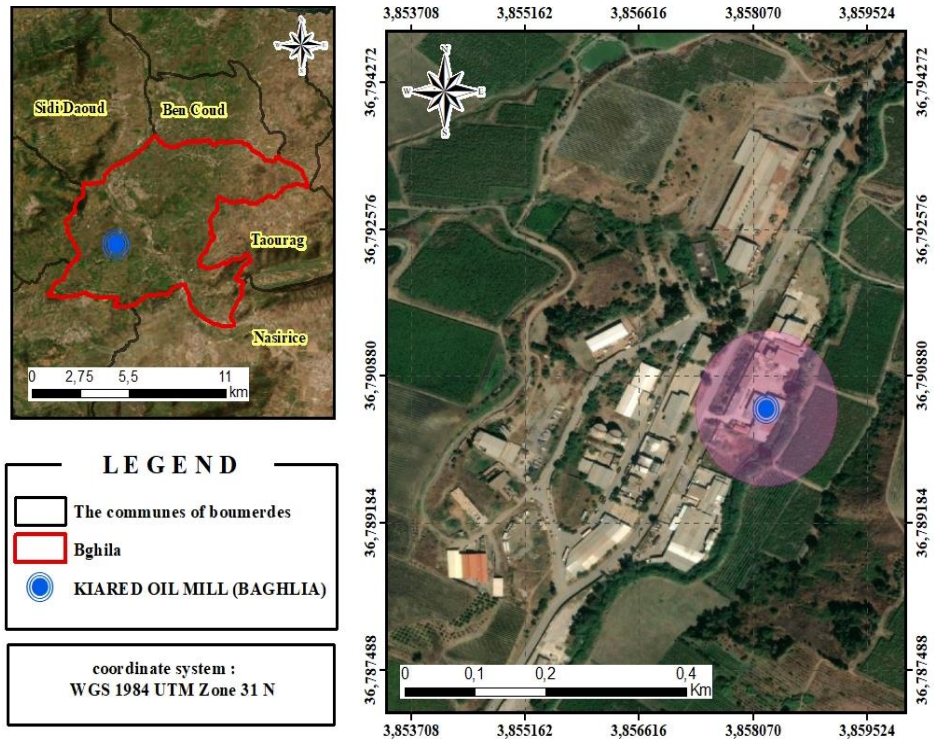


Figure 8. Geographical location Kiared oil mill of Baghlia (Source: Author, 2024)



Figure 9. Olive oil mill Beghlia Boumerdes (Source: Author, 2024)

The contribution of olive oil mill tourism to the regional development of Boumerdes

According to Stewart et al. (2008) we can point out that the increasing importance of gastronomy suggests and promotes the idea that knowledge of agricultural products can be, and often is, the main attraction to visit a particular region and not necessarily a second (or complementary) motivation of a trip. In this sense, we must remember that gastronomy reflects the historical, social, cultural and environmental heritage of peoples, i.e. the idiosyncrasy of its inhabitants (Brunori et al., 2001). Olive oil mills and olive groves not only offer environmental and natural design with their vast spaces of trees, but also provide a livelihood for a large number of families dedicated to olive oil production.

-Promoting healthy culinary practices by organizing oil-tasting festivals (food tourism).

-Sustainable Tourism: Oil-tourism offers the possibility of enjoying the resources that the earth offers us and creating tourist activities of an environmentally responsible agriculture such as that of the traditional olive grove.

-Promotes Rural Tourism: Through activities in the middle of nature Knowledge of an ancestral culture: by offering guided tour to the mill not only get to know the product, but also to convey a culture forged over stories of years, the fruit of the offspring that our ancestors have passed down from father to son as a legacy.

-Opportunity to learn about the production process: During the visits the cooperative mills, present a brief tour from the field and its collection, until the olive oil is obtained and its subsequent packaging.

- Production of some soaps, salves, ointments. etc from the oil giving a path towards other bio productions. showing them in way that attracts tourists (Figure 10).

-Stops rural depopulation: encouraging tourist activities in rural areas severely affected by depopulation. throught creation of small activities and jobs.

-Revival of history: there are historical olive trees that exceed more than 100 hundred years.

-Encouraging daily guided tours to the mill of Baghlia.

-Orginising Olive harvesting days.



Figure 10. Exhibition of various soaps, salves, and ointments made from oil (Source: author, 2024)

A significant challenge is the seasonality of this demand, which tends to peak at certain times of the year. To counteract this phenomenon, the creation of complementary activities is suggested to enrich the oleotourism experience, such as olive oil festivals, traditional cooking workshops using olive oil, and tasting sessions led by experts. Implementing appropriate strategies in this tourism segment could help de-seasonalize demand. Throughout the year, tourists could visit oil mills, olive museums, interpretation centers, and olive landscapes, creating stable employment in rural areas and preventing the depopulation of many inland villages. Beyond its economic impact, oleotourism plays a crucial role in preserving the rural landscape and conserving sustainable agricultural practices. Olive plantation, especially in Boumerdes, are a valuable environmental resource, contributing to soil erosion mitigation, combating desertification, and protecting biodiversity. By adopting ecological and biodynamic farming practices, many producers are committed to environmental conservation, enhancing the value of olive groves not only as an economic resource but also as an ecological and cultural asset.

DISCUSSION

The significant expansion of olive cultivation in the Boumerdes region over the past two decades, increasing from 5,700 ha in 2000 to 8,770 ha in 2022, reflects sustained efforts to diversify agricultural production and reduce reliance on vineyards. This growth has been supported by government programs focused on land rehabilitation and assistance to farmers affected by fires and unfavorable weather conditions. The olive groves, concentrated in mountainous areas, play a key role in local economic development. The increase in cultivated areas has been accompanied by a notable rise in olive oil production, reaching 30,797 hectoliters in 2020. However, this production has shown fluctuations due to natural conditions, highlighting the need for better agricultural risk management. The region has nine olive oil mills, five of which are operational.

Among them, the Baghlia mill stands out for its high production capacity (400 m³/year) and modernized equipment. This mill has transitioned into a commercial press, producing high-quality virgin and extra-virgin olive oil, earning several international awards. The potential for olive oil tourism is also highlighted as a lever for boosting the local economy. The "Olive Road" project aims to promote cultural and gastronomic experiences, showcasing local heritage through guided tours, festivals, and culinary workshops. This form of sustainable tourism can contribute to revitalizing rural areas, creating jobs, and preserving traditions. Initiatives such as organizing harvest days and olive oil tasting events attract visitors throughout the year, reducing dependence on seasonal demand. Additionally, the production of derivative products, such as soaps and cosmetics, provides opportunities to diversify income streams. Finally, beyond its economic impact, olive cultivation contributes to environmental protection by preventing soil erosion and preserving biodiversity. The adoption of eco-friendly farming practices enhances the value of olive groves as sustainable resources while promoting environmentally responsible agriculture.

CONCLUSION

Olive cultivation in the Province of Boumerdès is considered a living model of sustainable agriculture that combines both economic and environmental aspects. This cultivation has proven to be not only a major source of agricultural production but also an opportunity to enhance agricultural tourism, especially through the development of "Olive tree farm tourism and olive oil mills," which contribute to agricultural development, stimulate the local economy, and achieve sustainable rural development. The efforts of the government and local initiatives supporting this agriculture emphasize the importance of agricultural diversity and the transition to environmentally friendly farming methods, thereby enhancing the economic value of the region and preserving its natural heritage. Given the challenges it faces, it is crucial to continue improving agricultural practices and strengthening agricultural risk management to ensure the sustainability of production in the long term.

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DIVERSE SPATIAL TYPOLOGIES OF CROSS-BORDER TOURISM: INSIGHTS FROM INDONESIA

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Abstract: Globalization has undeniably positioned cross-border tourism as a crucial catalyst for driving economic, social, and cultural exchanges. As an archipelago, Indonesia shares borders with neighboring countries and possesses considerable potential for cross-border tourism. This study aims to explore the spatial typology of cross-border tourism in Indonesia. This study examines three of Indonesia's nine designated cross-border tourism areas, which correspond to the country's three land borders. This study utilized a mixed methods approach to gather data. Regional typology data were collected through map interpretation, direct observation, and secondary sources. Additionally, tourist typologies were obtained by conducting in-depth interviews with 30 border crossers from each border area. The findings highlight the diverse types of cross-border tourism in Indonesia, shaped by spatial, political, historical, and ethnic factors. While these types align with global studies, they also possess unique characteristics specific to Indonesia. Notably, the research shows that borders serve as gateways rather than barriers, with tourist attractions often located near border zones. Additionally, diplomatic relations, historical conflicts, and inter-ethnic connections significantly shape cross-border tourist movements. Furthermore, this study identifies the primary spatial typologies of cross-border tourism in Indonesia, including transit-oriented border tourism, destination-based tourism, and multifunctional tourism regions. The typologies of tourist movement patterns range from single-point visits to more complex destination loops, varying based on the level of integration between border regions. Additionally, the study finds that Indonesia's border tourism areas function as economic and cultural hubs, with market activities, local attractions, and regional mobility playing significant roles in shaping the tourism landscape. This research contributes to the limited literature on cross-border tourism in Southeast Asia. The findings offer valuable insights for policymakers and stakeholders aiming to enhance tourism development, foster regional connectivity, and optimize cross-border opportunities. Future studies should investigate additional border areas and conduct longitudinal analyses to understand tourism dynamics better.

Keywords: cross-border, development, Indonesia, spatial, tourism, tourist attraction, typology

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INTRODUCTION

Various indicators increasingly show positive developments in global tourism in the last decade. As a field of study, tourism continues to receive attention from researchers from various scientific fields with various new topics (Aji et al., 2024; Bhowmik, 2021; Mulet-Forteza et al., 2019). Furthermore, the impact of tourism on the global economy is growing (Chinoune et al., 2024; Lekgau et al., 2024), reflecting the evolving relationships between nations, which is also becoming a significant issue (Rasool et al., 2021). One area of study that discusses tourism in the context of relations between countries is cross-border tourism. Regarding scientific publications, cross-border tourism is relatively new (Salouw et al., 2023). Cross-border tourism is a tourism activity that involves two neighboring countries. Nonetheless, scholars' perspectives regarding cross-border tourism, especially the location, still differ. Previous studies were conducted in areas bordering the sea and considered cross-border tourism (Hampton, 2010).

In addition, other studies also view cross-border tourism from a land border perspective (Alas & Anshari, 2021; Gorochnaya et al., 2021; Mikhaylova et al., 2022; Tambovceva et al., 2020; Timothy, 1999).

The absence of a conclusive agreement regarding the characteristics of cross-border tourism (Batala et al., 2017; Hampton, 2010) makes the urgency of research on the typology of cross-border tourism even more important. From the perspective of research locations, until now, research on cross-border tourism in Asia is still very minimal, especially in Indonesia (Salouw et al., 2023). So far, scholars from the European and American continents have produced many studies on cross-border tourism. More research on cross-border tourism will contribute to the characteristics of cross-border tourism globally. In addition, research on the typology of cross-border tourism can enrich this topic.

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Within the scope of cross-border tourism studies, several previous studies have been conducted regarding the typology of cross-border tourism. For instance, Boonchai & Freathy (2020) researched ignored shoppers. In addition, Székely (2011) also reviewed the typology of cross-border tourism in general. However, previous research on the typology of cross-border tourism has not been comprehensive in reviewing regional and tourist typologies. Therefore, this study was conducted to explore the typology of cross-border tourism in Indonesia, specifically on the spatial aspect regarding the research question; what is the spatial typology of cross-border tourism in Indonesia, and its implications for future research? The findings in this study will be an important insight for stakeholders, and contribute to the enrichment of knowledge, especially regarding cross-border tourism typologies.

LITERATURE REVIEW

Cross-border tourism

The temporary movement of people from their home environment to a new place for leisure, health, sports, religion, and visiting family is part of tourism activity (Timothy & Gelbman, 2023). Thus, cross-border tourism can be seen as an activity across borders motivated by the need for travel. Cross-border tourism can be viewed from the point of view of land and sea borders. However, until now, it is still a critical discussion regarding the location of cross-border tourism (Hampton, 2010; Salouw et al., 2023). In the last decade, research on cross-border tourism has continued to increase. Previous research on cross-border has not explicitly discussed the typology of cross-border tourism and its characteristics. This study explores the typology of cross-border tourism in Indonesia.

In Indonesia, cross-border tourism has become an essential discourse for tourism stakeholders. This can be seen from the efforts of the Indonesian government to have established nine cross-border tourism areas in Indonesia (Figure 1). These nine cross-border tourism areas are located on sea and land borders in Indonesia. In this study, the cross-border tourism area studied is the cross-border tourism area that is on the land border.

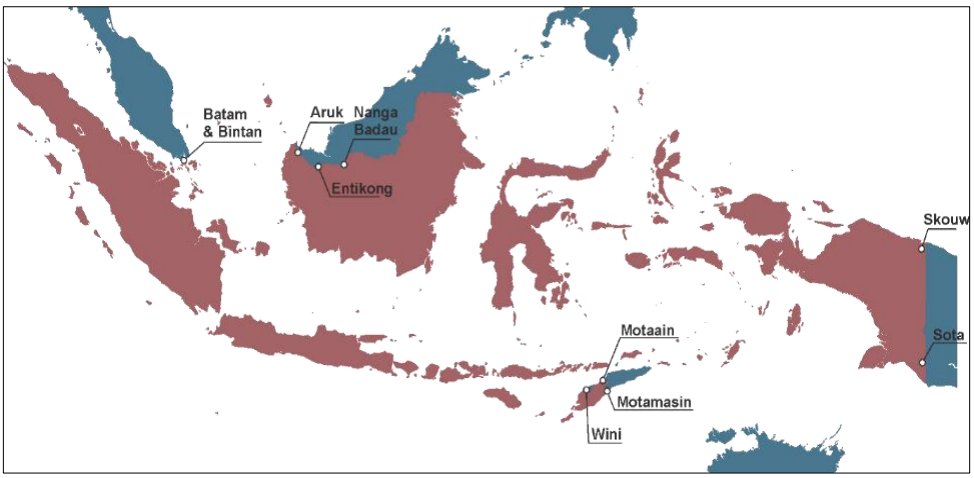


Figure 1. Nine cross-border tourism areas in Indonesia (Source: Modified from the Topographic Map of Indonesia (RBI) by the authors)

Description: A map of Indonesia highlighting various cross-border tourism areas along its sea and land borders. Key locations include Batam and Bintan on the border with Singapore; Entikong, Aruk, and Nanga Badau on the border with Malaysia; Mota'ain, Motamasin, and Wini on the border with Timor Leste; and Skouw and Sota on the border with Papua New Guinea. These areas are marked in blue, while the rest of Indonesia is shaded in red. The map visually emphasizes the distribution of cross-border tourism sites across Indonesia's eastern and western regions.

Typology of cross-border tourism

The term typology originates from the Greek words typos and logy, which mean the study of the shape or description of an object. Typological studies in tourism can study form, spatial, description, and classification according to certain phenomena in tourist motivation and behavior (Fletcher et al., 2017). Typology studies do not merely describe the object of study. However, it can provide a clear picture of a situation and contribute to a scientific field. This study explores the typology of cross-border tourism based on spatial aspects. In order to simplify and organize the explanations in this study, codes are given in each typology.

a. Typology of tourist attraction in cross-border tourism

In terms of the relationship between international borders and tourism Matznetter (1979) divides the border into three types, namely: a) the first type is a tourist area located far from the borderline, b) the second type is a tourist attraction located on one side of the border only, c) the third type is a tourist attraction that stretches across or meets the border area. In this study, the code for this typology is **a1.**

b. Border function in cross-border tourism

In his work, Timothy explains the spatial typology of cross-border tourism areas in more detail (Figure 2). According to Timothy, (2001) a) borders can become a barrier, b) borders can become tourist destinations, and c) borders can also change the tourism landscape. In this study, the code for this typology is **b1.**

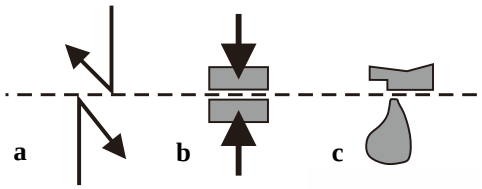


Figure 2. The function of the border in tourism according to Timothy (2001)

Description: Diagram representing three types of borders based on their function in cross-border tourism, adapted from Timothy (2001). (a) Shows a border as a barrier with arrows indicating that crossing is not permitted, symbolized by arrows being blocked by a vertical line. (b) Illustrates a border as a tourism destination, depicted by arrows converging at a central square, signifying a point of interest or attraction. (c) Depicts the border as a landscape transformer with a symbol of a dripping faucet, suggesting the border's impact on altering the tourism landscape. Each part is marked with a dotted horizontal line representing the border line.In their recent book, Timothy & Gelbman (2023) describes the attractiveness factors in cross-border tourism in 3 factors, namely; 1) The Border as the subject of a tourist attraction (geopolitical, historical, heritage, markings on the ground), 2) The Location and Environment of the border as a tourist attraction (natural and cultural appeal), 3) The Development of the Borderland as a tourist destination (recreation, shopping, gambling). In this study, the code for this typology is **b2.**

c. Development phase and location of the cross-border tourism region

One of the spatial aspects in the cross-border tourism area is the development phase of the region, as explained by Więckowski (2011). According to Więckowski, there are four phases in the development of cross-border tourism (Figure 3), namely, (a) coexisting spaces, (b) connected spaces, (c) open spaces, and (d) integrated spaces. In this study, the code for this typology is **c1.**

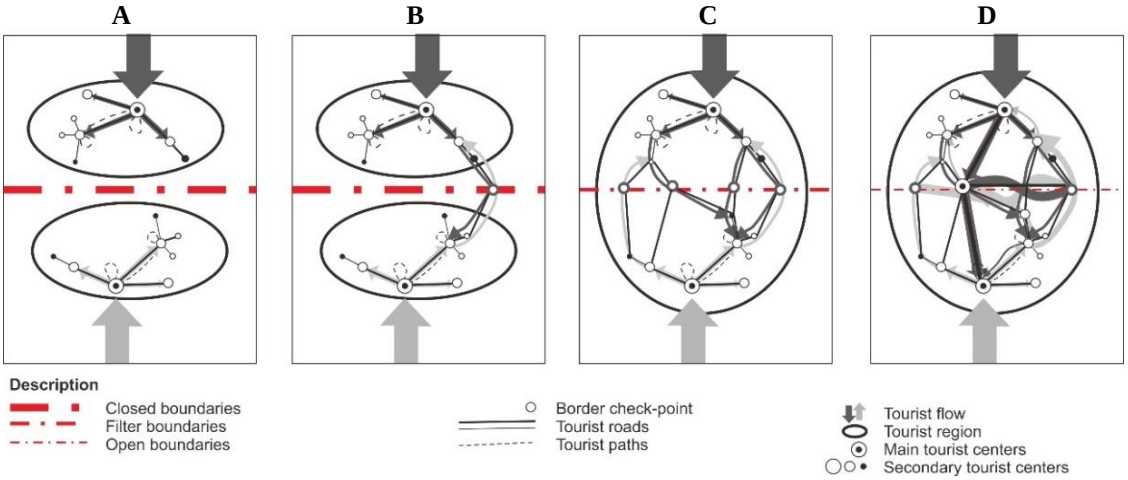


Figure 3. The development phase of cross-border tourism (Source: Więckowski, 2011)

Description: A series of four diagrams illustrating the developmental phases of cross-border tourism according to Więckowski (2011). Panel A displays 'Coexisting Spaces' with separate tourist flows and centers, indicated by isolated paths within closed boundaries. Panel B, labeled 'Connected Spaces,' shows paths that converge at border checkpoints within filter boundaries, suggesting interaction between regions. Panel C, titled 'Open Spaces,' features open boundaries with interconnected paths and regions, indicating free movement. Panel D represents 'Integrated Spaces' where all elements including tourist flows, regions, and centers are fully connected across open boundaries, demonstrating complete integration. Each panel includes symbols for closed, filter, and open boundaries, border checkpoints, tourist roads, paths, regions, main, and secondary tourist centers. Moreover, in his studies in Central Europe, Więckowski (2011) also describes the typology of cross-border tourism in five types (Figure 4). First, cross-border tourism, which is located in a protected area (a), sky cross-border tourist region (b), transit cross-border tourism (c), Cross-border tourism of borders town (d), and multifunctional cross-border tourist region (e). In this study, the code for this typology is **c2.**

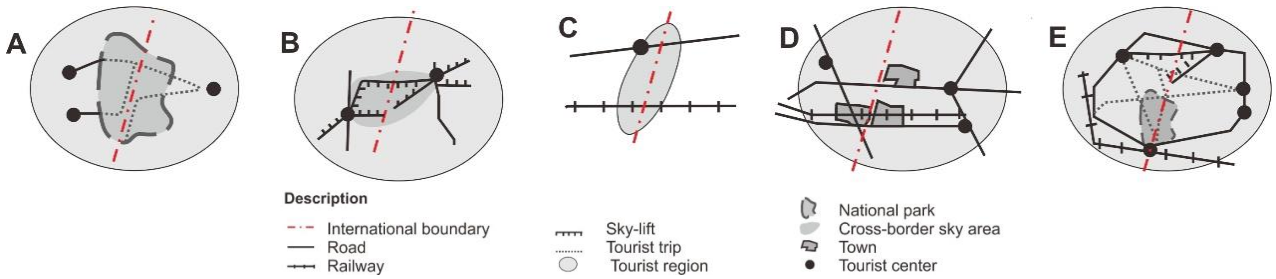


Figure 4. Typology of cross-border tourism locations (Source: Więckowski, 2011)

Description: A series of five diagrams illustrating the main types of cross-border tourist regions, adapted from Więckowski (2011). Panel A depicts a cross-border protected area, marked by a dotted international boundary encompassing roads, railways, and a national park. Panel B shows a cross-border ski area, featuring ski lifts and roads intersecting through the boundary. Panel C represents a transit cross-border tourism area, with roads and railways crossing a simple dotted line for the boundary. Panel D illustrates a border town tourist region, with towns connected by roads and railways across the boundary. Panel E shows a multifunctional cross-border tourist region, where roads, railways, and diverse tourist centers and trips form a complex network within a national park and across the boundary. Each diagram includes legends for roads, railways, sky-lifts, tourist trips, regions, and centers to clarify the interactions and connectivity in these cross-border areas.

d. Tourist Spatial Movement Pattern

This study uses the tourist spatial movement pattern Lau & McKercher (2006) to explore tourist movement patterns in cross-border tourism areas (Figure 5). Lau & McKercher (2006) summarised tourist movement patterns in three groups: single patterns, multiple patterns consisting of baseline, stopover, and chain loop, and complex patterns consisting of destination region loop and complex neighborhood. In this study, the code for this typology is **d1.**

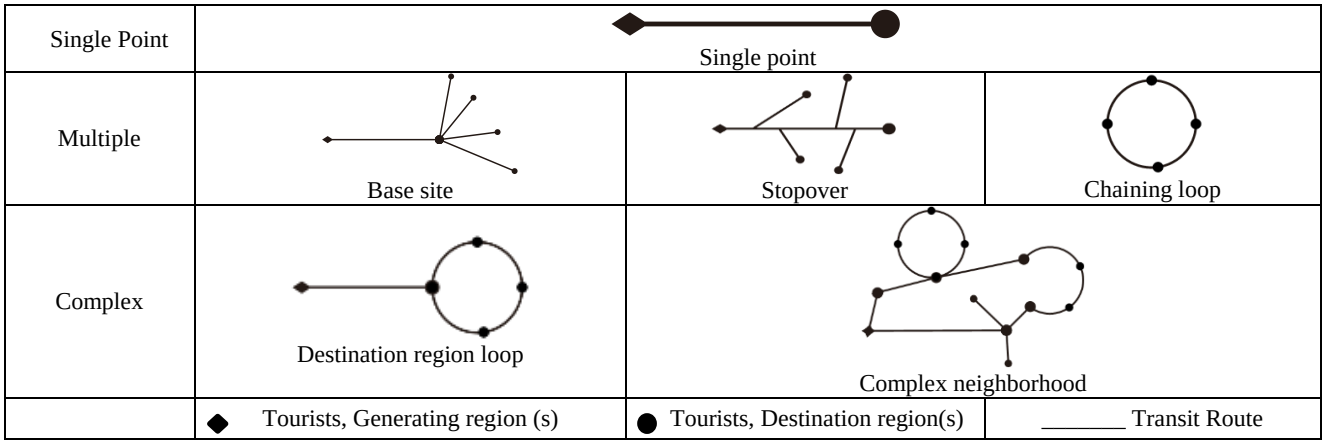


Figure 5. Tourist movement pattern (Source: Lau & McKercher, 2006)

Description: A diagram illustrating four categories of tourist movement patterns, categorized as Single Point, Multiple, and Complex, adapted from Lau & McKercher (2006). In the Single Point category, a line with two ends represents non-diversified travel where tourists visit a destination and return directly, using the same route. The Multiple category showcases three sub-patterns: 'Base site,' characterized by multiple short trips emanating from a central point; 'Stopover,' involving sequential stops; and 'Chaining loop,' a circular route connecting various stops. The Complex category includes 'Destination region loop,' a circular route within a single destination, and 'Complex neighborhood,' featuring interconnected travel paths across multiple nearby locations. Icons represent tourists' generating regions (diamonds) and destination regions (circles), with lines indicating transit routes.

METHODS

This study was carried out in three cross-border tourism areas in Indonesia (Figure 6). Indonesia's three selected cross-border tourism areas are Mota'ain, Skouw, and Entikong. The three cross-border tourism areas represent three land borders in Indonesia. In addition, the three cross-border tourism areas have the highest visits compared to other regions on the same border. Mota'ain is the border area between Indonesia - Timor Leste, Skouw is between Indonesia - Papua New Guinea, and Entikong is between Indonesia – Malaysia.



Figure 6. Research area selection criteria (Source: Authors, 2024)

Description: The image representing the selection of this research location. The image is divided into three segments: The first (left diagram) lists nine cross-border tourism areas determined by the Indonesian Ministry of Tourism and

Creative Economy. The second (middle diagram) narrows the focus to eight areas specifically on the land border. The final segment (right diagram) highlights three areas representing the major islands in Indonesia with the highest visitation rates. This image captures the methodical selection process for the research areas.

Data collection in this study was carried out for six months. The first three months were used to collect secondary data such as maps and other supporting documents to assess spatial typology. The next three months are data collection through direct observation of tourists. In-depth interviews were conducted with 30 tourists in each cross-border tourism area. Since this study uses an Indonesian perspective, the tourists interviewed are tourists who have finished visiting Indonesia and will return to their country of origin through cross-border tourism areas.

Interpretation is carried out on the map obtained to produce an area typology. On the other hand, the results of in-depth interviews were analyzed using the Nvivo application to reveal the qualitative and structured meaning of the interview results. Specifically, each typology is answered using the following methods:

Table 1. Data sources and analysis methods (Source: Authors, 2024)

code	Typologies	Data source	Analysis method
a1	Typology of tourist attraction	Satellite imagery and direct observation	Satellite imagery and spatial analysis
b1	Border function in tourism	Direct observation	Descriptive
b2	Border function in tourism	Direct observation	Descriptive
c1	Development phase of cross-border tourism region	Direct observation and literature study	Spatial and descriptive analysis
c2	Cross-border tourism location	Direct observation and literature study	Spatial and descriptive analysis
d1	Tourist spatial movement pattern	In-depth interviews with tourists	Spatial and descriptive analysis

RESEARCH RESULTS

This study has successfully explored the typology of cross-border tourism in Indonesia (Figure 7). Each typology is explained descriptively based on the results of direct observation, literature study, in-depth interviews, and interpretation of satellite imagery. Typology of tourist attraction in cross-border tourism (**a1)**.

In the three cross-border tourism areas included in this study, the typology of cross-border tourist attractions in Indonesia tends to be homogeneous. Generally, the gate is the main tourist attraction in every cross-border tourism area in Indonesia. Each gate's architecture in Indonesia's cross-border tourism area is unique. It has its characteristics so that it becomes a tourist. In addition to architecture, other tourist attractions in the three cross-border tourism areas are beaches (Skouw and Mota'ain), traditional markets, and forests. Thus, the typology of tourist attraction in the three cross-border tourism areas in Indonesia is a tourist attraction that stretches across or meets in border areas.

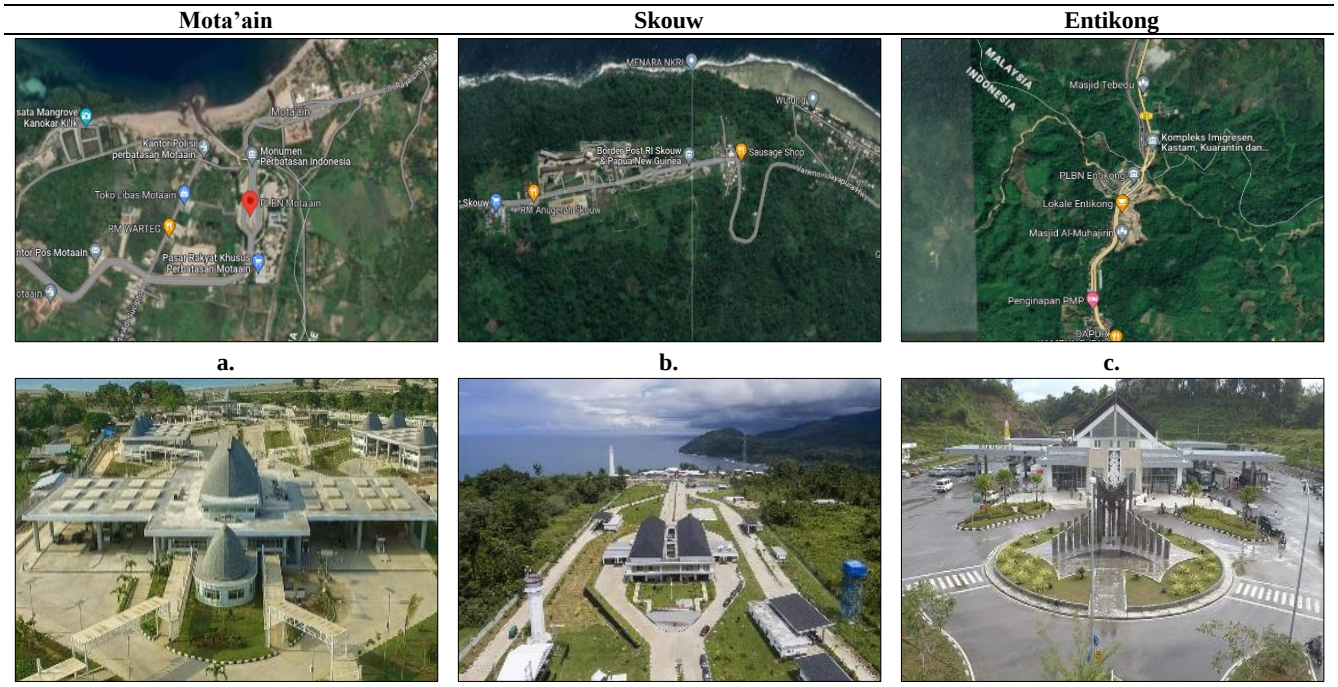


Figure 7. Typology of tourist attractions in the cross-border tourism area

Description: A collage of six images showcasing tourist attractions in cross-border areas of Indonesia.

a. Satellite image showing the border area between Indonesia and Timor-Leste at Motaain. Source: Downloaded from Google Earth, 2024.

b. Satellite image showing the border area between Indonesia and Papua New Guinea at Skouw. Source: Downloaded from Google Earth, 2024.

c. Satellite image showing the border area between Indonesia and Malaysia at Entikong. Source: Downloaded from Google Earth, 2024.

d. An aerial view of the State Border Crossing Post building (PLBN), which serves as the border entry and exit point in Motaain, Indonesia. Source: Motaain PLBN Document. Accessed November 2024.

e. An aerial view of the State Border Crossing Post building (PLBN), which serves as the border entry and exit point in Skouw, Indonesia. Source: Skouw PLBN Document. Accessed Januari 2024.

f. An aerial view of the State Border Crossing Post building (PLBN), which serves as the border entry and exit point in Entikong, Indonesia. Source: Entikong PLBN Document. Accessed April 2024.

Border function in tourism (**b1)**.

Based on the typology of border function in cross-border tourism, through direct observation, it is clear that all cross-border tourism in Indonesia also plays a role as a tourist destination (Figure 8). In addition, border areas in Indonesia also function as a change in the tourism landscape. No border becomes a barrier in the context of cross-border tourism in Indonesia.

Border function in cross-border tourism (**b2)**.

Descriptively, it can be explained that the location of cross-border tourism in Indonesia is based on the views of Timothy and Gelbman (Timothy & Gelbman, 2023); all of them can be found in the cross-border tourism area in Indonesia. Based on the results of direct observation, the three cross-border tourism areas in Indonesia play a role as the subject of tourist attraction with historical and geopolitical values.

In addition, the location and environment of cross-border tourism in Indonesia have also become a tourist attraction. It is also clear that the development of border areas as tourist destinations, especially shopping tourism in Indonesia's three cross-border tourism areas, has both traditional and modern markets.

Mota'ain	Skouw	Entikong
		
a. Shopping atmosphere at Mota'ain traditional market	**b.** The process of shopping for people from Papua New Guinea at the Skouw Market	**c.** The modern market in Entikong

Figure 8. Market activity in the border area of Indonesia

Description: This image set illustrates market activities at three of Indonesia's land border areas. These images collectively highlight the vibrant commercial interactions typical of Indonesia's border markets

a. Image (a) depicts the lively shopping environment at the traditional market in Mota'ain, where vendors and shoppers interact under a large open structure.

b. Image (b) shows the shopping process at Skouw Market, featuring an Indonesian vendor interacting with buyers amidst colorful merchandise.

c. Image (c) shows the modern market in Entikong, bustling with activity as people and vehicles gather in a spacious paved area surrounded by lush hills. These images together highlight the vibrant commercial interactions typical of Indonesia's border markets.

Source: Authors, 2024.

Development phase of cross-border tourism region (**c1)**

Direct observation clearly shows the typology of spatial development in Indonesia's cross-border tourism context. The three borders have the same typology of connected space because the type of international border in Indonesia still applies filters with limited border crossing checkpoints.

Cross-border tourism location (**c2**)

Cross-border tourism in Indonesia is generally a transit area. Border cities in Indonesia are usually far from the border gate, so there is no typology of cross-border tourism in border cities.

Tourist spatial movement pattern (**d1**)

The tourist spatial movement pattern in this study is elaborated in general to assess the trend of the spatial movement of tourists in three cross-border tourism areas in Indonesia. There are various movement patterns in Indonesia's three cross-border tourism areas. Based on the in - depth interviews with 30 cross-border tourists, the results show that in the cross-border tourism area between Indonesia - Timor Leste, the tourist movement pattern is dominated by complex patterns. In the Indonesia-Malaysia border area, the tourist movement pattern is dominated by multiple patterns. On the other hand, the cross-border tourism area between Indonesia - Papua New Guinea is dominated by single points.

DISCUSSION

This study has successfully explored the spatial typology of cross-border tourism in Indonesia based on pre-existing typologies from previous studies. Not all typologies generated based on previous scholarly studies are identical to those in Indonesia. The reason is that each cross-border tourism area has unique characteristics.

In this study, the delimiter type was found. Delimiter types in cross-border tourism in Indonesia follow natural barriers such as rivers and mountains or artificial boundaries such as roads and dams. This typology was added to the study as a finding. Table 2 clearly shows the spatial typology of cross-border tourism in Indonesia.

Table 2. Spatial typology of cross-border tourism in Indonesia (Source: Authors, 2024)

The typology of cross-border tourism		Cross-border tourism in Indonesia		
Typology	Characteristics	Mota'ain	Skouw	Entikong
Typology of tourist attraction (Matznetter, 1979) (a1)	Tourist area located far from the borderline			
	Tourist attractions located on one side of the border			
	Tourist attraction stretches across or meets the border area	✓	✓	✓
Border function in cross-border tourism (Timothy, 2001) (b1)	Borders as barriers			
	Borders as tourist attractions	✓	✓	✓
	The border changes the tourism landscape			
Border function in tourism (Timothy, 2001) (b2)	The Border as Subject of a tourist attraction	✓	✓	✓
	The Location and Environment of the border as a tourist attraction	✓	✓	✓
	The Development of the Borderland as a tourist destination	✓	✓	✓
Development phase of cross-border tourism region (Więckowski, 2011) (c1)	Coexisting space			
	Connected space	✓	✓	✓
	Open space			
	Integrated spaces			
Cross-border tourism location (Więckowski, 2011) (c2)	Cross-border tourism in protected areas			
	Sky cross-border tourist region			
	Transit cross-border tourism	✓	✓	✓
	Cross-border tourism of borders town			
	Multifunctional cross-border tourist region			
Tourist spatial movement pattern (Lau & McKercher, 2006) (d1)	Single Point		✓	
	Multiple			✓
	Complex	✓		
Delimiter type (e1)	Dam			
	Road			
	River	✓	✓	
	Mountain		✓	✓

The analysis results indicate that two main factors influence the spatial typology of cross-border tourism. The first is the natural factor, and the second is the human factor. Some typologies are influenced by just one factor, and both factors influence some. Although all international borders are man-made (Timothy, 2001), this study found that natural factors are also crucial because borders can be formed from natural factors such as mountains and rivers.

In this study, the typology is also influenced by the diplomatic relations of bordering countries, the history of conflict, and ethnic relations. State diplomatic relations can be seen in cooperation documents, border agreements, and coordination between bordering countries. The history of the conflict is also a part that influences the typology. Finally, inter-ethnic relations are one of the vital factors influencing typology.

CONCLUSIONS

This study successfully elaborates on the typology of cross-border tourism in Indonesia, enriching the findings of the typology of cross-border tourism and showing the characteristics of cross-border tourism specifically in Indonesia. This is important because research on cross-border tourism has rarely been carried out in Asian countries, especially in Indonesia. It can be concluded that the typology of cross-border tourism in Indonesia is generally similar to previous studies that scholars have conducted. However, several characteristics look different and have uniqueness.

In addition to the critical findings in this study, the limitation is the wide area coverage that requires more time to explore the characteristics of cross-border tourism in more depth. Further studies are suggested to examine each spatial characteristic of cross-border tourism in Indonesia to make the findings more detailed and in-depth. Furthermore, since this study focuses exclusively on land borders, future research should explore sea borders or a combination of both. This approach would yield a broader range of findings and provide a more in-depth contribution to the discussion on cross-border tourism.

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PSYCHOLOGICAL CAPITAL AS A PATHWAY BETWEEN SERVANT LEADERSHIP AND WORKPLACE WELL-BEING IN THE HOSPITALITY INDUSTRY CONTEXT

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Abstract: The hospitality industry presents a uniquely demanding work environment, characterized by high levels of stress, emotional labor, and continuous guest interaction, making employee workplace well-being (WPW) a crucial factor for sustainable organizational success. Leadership practices are central to fostering WPW, with servant leadership (SL) emerging as a people-centered approach that emphasizes employee growth, empowerment, and ethical conduct. While previous research has linked SL to various positive employee outcomes, the mechanisms through which SL influences WPW are still underexplored. This study addresses this gap by examining the mediating role of psychological capital (PsyCap) - comprising hope, optimism, resilience, and self-efficacy - in the relationship between SL and WPW within the hospitality sector. This study employed a cross-sectional research design to explore the relationship between servant leadership (SL) and workplace well-being (WPW), with psychological capital (PsyCap) examined as a mediating variable. Data were collected from 442 frontline employees working in five-star hotels located in major cities across Saudi Arabia. Validated measurement instruments were used to assess perceptions of SL, PsyCap, and WPW. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to test both direct and indirect relationships among the variables. The results revealed that SL has a significant positive effect on WPW, both directly and indirectly. PsyCap was found to partially mediate this relationship, indicating that servant leadership enhances WPW not only through its direct influence but also by fostering key psychological resources - hope, resilience, optimism, and self-efficacy - in employees. This mediation highlights PsyCap as a critical psychological mechanism linking leadership behaviors to employee well-being outcomes. Theoretically, the study contributes to the leadership and organizational behavior literature by validating the role of PsyCap within the Conservation of Resources (COR) framework. From a practical standpoint, the findings emphasize the importance for hospitality managers to cultivate servant leadership qualities and invest in developing employees' psychological capital. Doing so can significantly improve employee well-being, strengthen organizational resilience, and enhance service performance in demanding hospitality environments.

Keywords: PsyCap, Well-being, service-oriented leadership, eco-centric leadership, environmentally specific leadership, hotel industry, Employee Well-Being, occupational health, Saudi Arabia, hospitality sector

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INTRODUCTION

The hospitality industry is a rapidly expanding global sector that provides extensive employment opportunities, particularly for women, youth, and migrant workers. However, despite its growth, it faces significant workforce challenges, primarily high employee turnover and mental health concerns (Karatepe et al., 2021; Abdou et al., 2022). Turnover rates in the industry surpass those of other sectors due to factors such as irregular and demanding work schedules, heavy workloads, job insecurity, and low wages (Dogru et al., 2023). Salama et al. (2022) identified role stressors, job strains, and negative work attitudes as key predictors of turnover in the hospitality sector. The impact of high turnover was particularly evident during the COVID-19 pandemic when the hospitality sector in the United States lost 3.5 million jobs, accounting for over a third of national unemployment (Croes et al., 2021).

Mental health concerns are another pressing issue in the hospitality industry, significantly influencing employee well-being and turnover rates (Karatepe et al., 2021). Hospitality jobs are inherently stressful due to high-pressure work environments, unpredictable workloads, and demanding customer interactions (Abdou et al., 2022). The COVID-19 pandemic further intensified these challenges, leading to an increase in anxiety, depression, and stress among employees (Aguiar-Quintana et al., 2021). Studies indicate that quarantine hotel employees, in particular, faced heightened fear of COVID-19, which resulted in severe mental health issues such as depression and stress (Rahimi et al., 2023). These psychological burdens have contributed to higher turnover rates as employees seek more stable and supportive work environments. Given the industry's reliance on service quality and customer satisfaction, workplace well-being (WPW) has become a critical area of focus for organizational success (Suneera et al., 2024; Koutiva et al., 2020).

WPW refers to employees' overall mental, emotional, and physical health within the work environment, encompassing job satisfaction, psychological health, and a sense of purpose (Dagenais-Desmarais & Savoie, 2012). WPW is particularly critical within the hospitality sector as a result of the high-pressure nature of frontline roles, which often involve emotional labor, irregular schedules, and constant customer interactions. High levels of WPW lead to favorable outcomes such as increased employee engagement, retention, productivity, and reduced turnover, all of which are vital in service-oriented

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industries (Gelencsér et al., 2023, Pratiwi & Davina, 2023; Isham et al., 2021). Conversely, poor WPW can lead to burnout, absenteeism, and diminished service quality. Given its significance, fostering WPW requires supportive leadership, adequate resources, and a culture that prioritizes employee health and development. Leadership styles like servant leadership (SL) play a pivotal role in enhancing WPW by creating a supportive environment and addressing employees' psychological and emotional needs (Roberts, 2021; Swanson et al., 2022; Zeng et al., 2022)

SL is recognized as a leadership model emphasizing prioritizing the needs, growth, and well-being of employees over traditional authority-driven approaches. Based on Greenleaf (1977), SL focuses on creating a supportive and empowering environment where leaders act as role models, foster trust, and prioritize ethical behavior. Key traits and values associated with servant leadership include empathy, integrity, competence, benevolence-caring, humane orientation, empowerment, humility, and a commitment to helping employees achieve their personal and professional goals (Cogswell et al., 2023). SL is particularly impactful in the hospitality industry, where employees frequently face high-pressure situations and must deliver exceptional service (Bavik, 2020; Gui et al., 2021). By addressing employees' emotional and psychological needs, servant leaders can enhance job satisfaction, reduce stress, and foster a culture of care and collaboration (Widayanthi et al., 2024; Kim et al., 2024). Psychological capital (PsyCap) is a core concept in positive organizational behavior, representing a person's positive psychological condition distinguished by four key dimensions: hope, optimism, resilience, and self-efficacy (Luthans et al., 2007). Hope reflects an individual's ability to set meaningful goals and find pathways to attain them, regardless of the barriers encountered. Optimism is the tendency to expect positive outcomes and attribute successes to personal efforts. Resilience involves the ability to restore balance after setbacks and face challenges effectively, while self-efficacy represents confidence in one's ability to accomplish tasks and overcome difficulties. Collectively, these dimensions equip employees with the mental resources needed to navigate workplace challenges effectively, enhancing engagement, performance, and well-being (Brunetto et al., 2022; Amish & Biswal, 2024). PsyCap has been demonstrated to act as a mediator between various leadership styles and workplace outcomes, making it a critical factor in understanding how positive leadership, such as servant leadership, fosters employee well-being and organizational success (Batool et al., 2022; Baykal, 2020; Clarence et al., 2021; Gao & Huang, 2024; Bakri et al., 2023). This research suggests that leadership styles, including SL, play a pivotal role in fostering PsyCap, which in turn can positively impact workplace well-being.

While the positive effects of SL and PsyCap on various employee outcomes have been well-documented, there is a lack of empirical research addressing the intermediating role of PsyCap in the SL-WPW association within the hospitality sector. Furthermore, most existing studies have been conducted in non-hospitality contexts or focused on broader organizational outcomes, leaving a gap in understanding how SL and PsyCap jointly contribute to WPW in service-oriented environments. Accordingly, this research aims to investigate the effect of SL on employees' WPW in the context of the hospitality industry, specifically focusing on PsyCap as an intermediating variable. More specifically, this study aims to achieve a fourfold objective. First, it examines the direct impact of servant leadership (SL) on workplace well-being (WPW) in the hospitality industry. Second, it explores the effect of SL on employees' psychological capital (PsyCap), assessing how leadership behaviors contribute to enhancing psychological resources such as hope, resilience, optimism, and self-efficacy. Third, it investigates the relationship between PsyCap and WPW, determining whether employees with higher PsyCap experience greater WPW. Furthermore, this study investigates the mediating role of PsyCap in the SL-WPW relationship, providing empirical insights into the psychological mechanisms through which SL influences employee well-being. To achieve this aim, the study addresses the following research questions: 1) How does servant leadership influence employees' psychological capital and workplace well-being in the hospitality industry? 2) To what extent PsyCap affect employee WPW? 3) What role does PsyCap play in mediating the relationship between SL and WPW? Regarding the contribution of the study, this research enhances the understanding of leadership's role in promoting employees' workplace well-being (WPW) within the hospitality industry by providing empirical evidence of the mechanisms linking servant leadership (SL) and WPW through psychological capital (PsyCap). By emphasizing the significance of PsyCap resources, the study highlights how SL fosters a supportive and resource-rich work environment, leading to improved workplace well-being. The findings offer practical insights for hospitality managers, suggesting that cultivating servant leadership behaviors and investing in PsyCap development may significantly enhance employees' WPW. In summary, this research introduces a nuanced perspective on the relationship between SL and WPW, mediated by PsyCap. The findings expand academic literature by deepening the theoretical insights into the SL's dual pathways of influence, direct and mediating, and providing actionable strategies for hospitality organizations aiming to create a healthier, more supportive workplace culture.

THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

The interplay between Servant leadership (SL) and workplace well-being (WPW)

The term SL was introduced by Greenleaf in his seminal work *The Servant as Leader*, emphasizing that effective leadership arises from prioritizing the service and well-being of followers (Zeng et al., 2022). Greenleaf (1977) conceptualized SL as a leadership philosophy emphasizing service to others—particularly employees—over traditional models focused on authority and control. This approach centers on addressing employees' needs, fostering trust, and positively influencing them through service-oriented leadership. Earlier research identified twelve primary characteristics of SL, including "valuing people, humility, listening, trust, caring, integrity, service, empowering, serving others' needs before their own, collaboration, love/unconditional love, and learning" (Focht & Ponton, 2015). These attributes highlight SL's relational, emotional, and ethical dimensions (Eva et al., 2019). Compared to transformational leadership, servant leadership prioritizes employee well-being, empowerment, and ethical behavior over organizational goals. While transformational leaders inspire innovation and performance by acting as visionaries and role models, servant leaders take a

people-centered approach, ensuring employees' needs are met first, which in turn fosters organizational success. Although transformational leadership enhances engagement, motivation, and creativity through inspiration, empowerment, and individualized support—fostering a work environment where employees feel motivated, valued, and committed to organizational goals—it may also lead to burnout if employees feel pressured to meet ambitious expectations. In contrast, servant leadership builds trust, emotional well-being, and long-term commitment, creating a more supportive and ethical workplace culture (Goestjahjanti et al., 2022; Subhaktiyasa et al., 2023; Martinez & Leija, 2023) .

In the context of the SL-WPW relationship, numerous studies suggested that SL has been associated with various positive organizational outcomes. In the context of the hospitality sector, SL has been shown to significantly predict organizational citizenship behavior (Demissie et al., 2024), employee satisfaction and performance (Sudiarti & Hedi Saepudin, 2024), employee creativity (Song et al., 2024; Aboramadan, 2021), and some tourism business outcomes such as work engagement, innovative work behavior, person-job fit, work-life balance, and job crafting (Al-Azab & Al-Romeedy, 2024). Furthermore, research by Ortiz-Gómez et al. (2022) and Alzghoul et al. (2023) indicates that SL fosters a supportive work environment, enhancing employees' subjective well-being while reducing job burnout and anxiety. These findings underscore the effectiveness of servant leadership in promoting employee satisfaction, well-being, and creativity, as well as driving organizational success in service-oriented sectors. WPW refers to an employee's subjective positive assessment and emotional experience within the context of their work (Litchfield, 2021).

Derived from the broader concept of well-being, workplace well-being encompasses multiple dimensions, such as interpersonal compatibility, flourishing at work, acknowledgment, active involvement, and career growth (Saito et al., 2025). The emphasis on WPW has grown significantly in recent years due to its pivotal role in driving organizational performance (Pratiwi & Davina, 2023). Research shows that higher workplace well-being can lead to positive outcomes, including enhanced job performance and promoted employee retention (Gelencsér et al., 2023), increased engagement (Pratiwi & Davina, 2023), promoted physical and psychological well-being (Ryan et al., 2021), and enhanced labor productivity (Isham et al., 2021). These outcomes are particularly significant in the hospitality industry as they directly influence customer satisfaction and service quality.

In the context of the SL-WPW relationship, various studies have emphasized that SL is the key determinant for promoting WPW. By practicing humility, empathy, and active listening, servant leaders build meaningful relationships with their employees, strengthening a favorable work environment and boosting employees' happiness and well-being (Ortiz-Gómez et al., 2022; Song et al., 2024). Further, servant leaders create an atmosphere where employees feel safe expressing their concerns and ideas without fear of negative repercussions, which reduces workplace stress and promotes psychological, social, and physical well-being (Coetzer et al., 2017; Westbrook et al., 2022; Swanson et al., 2022). Based on the findings of their empirical investigation involving 215 young teachers from Chinese institutions, Zeng et al. (2022) concluded that SL is significantly positively correlated with WPW, suggesting that higher perceived SL in the higher education context leads to greater WPW. Similarly, a review study examined the impact of SL on WPW through 22 studies revealed that SL adds substantial incremental value compared to other leadership models, such as transformational and authentic leadership, by fostering foundational trust through ethical principles and cultivating supportive workplace relationships (Roberts, 2021). This leadership style effectively promotes global employee well-being, irrespective of geographical, cultural, or occupational contexts, highlighting its versatility and efficacy (Wang et al., 2022). Lastly, the COR theory developed by Hobfoll (1989) posited that employees strive to acquire, protect, and build resources, which are essential for managing stress and achieving well-being. Through its core attributes, such as empowerment, emotional support, trust-building, and addressing employees' needs, servant leadership can be seen as a key predictor that fosters the acquisition and replenishment of these resources leading to WPW. Hence, we assumed that:

H1: SL is significantly positively associated with WPW.

The interplay between Servant leadership (SL) and Psychological Capital (PsyCap)

PsyCap is recognized as a positive state of mind that includes a person's mental and emotional strengths, helping them succeed in difficult situations. Luthans et al. (2007, P. 3) defined PsyCap as "an individual's positive psychological state of development characterized by: (1) having confidence (self-efficacy) to take on and put in the necessary effort to succeed at challenging tasks; (2) making a positive attribution (optimism) about succeeding now and in the future; (3) persevering toward goals and, when necessary, redirecting paths to goals (hope) in order to succeed; and (4) when beset by problems and adversity, sustaining and bouncing back and even beyond (resilience) to attain success."

Research has shown that these positive resources are strongly influenced by various factors such as organizational climate, organizational support, and different leadership styles (Yan et al., 2024; Moustafa et al., 2024). Among sports employees, Kim et al. (2019) found that a supportive organizational climate and meaningful work significantly influenced PsyCap. These factors positively impact employees' PsyCap, increasing job satisfaction and psychological well-being. Regarding the relationship between leadership styles and PsyCap, various studies have demonstrated that transformational, transactional, authentic, inclusive, and servant leadership styles significantly enhance employees' PsyCap (Clarence et al., 2021; Sürücü et al., 2020; Yan et al., 2024; Fang et al., 2019). Numerous studies have explored the relationship between SL and PsyCap, revealing a consistent positive association (Jan & Imran, 2024; Brohi et al., 2021; Bouzari & Karatepe, 2017; Coggins & Bocarnea, 2015; Gui et al., 2021; Safavi & Bouzari, 2020). For example, through their empirical investigation on a sample of 400 hotel employees in Pakistan, Jan & Imran (2024) found that, rooted in Social Exchange Theory (SET), servant leaders' supportive and caring approach, characterized by forgiveness and guidance, directly and indirectly through person-job fit strengthens employees' psychological capital. In addition, a cross-culture study examined the link between SL and followers'

PsyCap in the United States and Cambodia revealed that the five components of SL "altruistic calling, emotional healing, wisdom, persuasive mapping, and organizational stewardship" are positively associated with the four components of PsyCap "hope, self-efficacy, optimism, and resilience" highlighting its effectiveness in cultivating a supportive and empowering work environment only across Cambodian context (Coggins & Bocarnea, 2015). Accordingly, they concluded that through its core attributes such as "altruistic calling, emotional healing, wisdom, persuasive mapping, and organizational stewardship" servant leadership inspires employees to set and pursue meaningful goals (hope), believe in their ability to succeed (self-efficacy), maintain a positive outlook on future outcomes (optimism), and recover from setbacks with confidence (resilience).

Similarly, a meta-analysis review carried out by Gui et al. (2021) to explore the impact of SL on followers' outcomes illustrated that SL is the key predictor of employees' PsyCap in the hospitality sector context. Furthermore, in the context of North Cyprus hotels, Safavi & Bouzari (2020) indicated that SL enhances PsyCap among front-line employees by improving their perceptions of person-organization fit and person–supervisor fit. Lastly, aligning with the COR theory, SL may act as a resource generator for employees, providing them with emotional, social, and psychological support that directly contributes to the promotion of PsyCap resources. Based on the previous findings, the following hypothesis is suggested.

H2: SL is significantly positively associated with employees' PsyCap.

The interplay between PsyCap and WPW

Research in positive psychology and organizational behavior underscores the significant relationship between PsyCap and WPW. PsyCap, an individual-level construct, influences employees' emotions, thoughts, attitudes, and behaviors. Recent studies have demonstrated this relationship, suggesting that employees with high PsyCap are more intrinsically motivated, receptive to meaningful work, and constructive in their interpersonal relationships (Al Kahtani & M, 2022; Brunetto et al., 2022; Amish & Biswal, 2024). For instance, results from a Multiple Linear Regression analysis of 92 permanent employees revealed a significant positive association between PsyCap and WPW ($R^2 = 0.263$), concluding that greater perceived PsyCap corresponds to higher WPW, while lower PsyCap results in reduced WPW (Rengganis et al., 2024). A study conducted on a random sample of 395 employees in Saudi Arabia found a significant relationship between PsyCap, including its four dimensions, and workplace well-being ($\beta = 0.781$) (Alkahtani et al., 2020). Theoretically, a review by Youssef-Morgan & Luthans (2015) highlighted PsyCap's potential to enhance well-being both at and beyond the workplace by strengthening individuals' capacities for flourishing and optimal functioning. In an educational context, Sun et al. (2022) empirically demonstrated that PsyCap significantly predicts WPW among Chinese teachers. Furthermore, recent research involving 100 employees identified optimism, hope, and resilience as key predictors of overall workplace well-being (Amish & Biswal, 2024). Finally, based on COR theory, it could be posited that in the hospitality workplace context, PsyCap - comprising hope, efficacy, resilience, and optimism—may be a pivotal resource that employees utilize to manage job demands and challenges. More specifically, in the hospitality industry, where employees often face high levels of job demands and emotional labor, PsyCap enables individuals to conserve their resources effectively, which may lead to positive workplace attitudes and enhance employees' WPW. Accordingly, this study suggests that.

H3: PsyCap is significantly positively associated with employees' WPW.

The mediating role of PsyCap

In examining the mediating role of PsyCap, several empirical studies have confirmed its significant mediating effect in the relationship between SL and various positive outcomes. For example, Clarence et al. (2021) found that PsyCap resources partially mediated the association between SL and employees' affective commitment and psychological well-being. Similarly, Baykal (2020) demonstrated that PsyCap significantly mediated the connection between SL and employees' productivity, highlighting how SL positively influences PsyCap, which, in turn, enhances productivity. In the Chinese higher education context, Gao & Huang (2024) observed that teachers' PsyCap has a partial intermediating effect of perceived SL on organizational citizenship behavior. Further, in the banking context and grounded in servant leadership theory, Qamar & Soomro (2025) conclude a significant relationship between SL, PsyCap, and service excellence. PsyCap was identified as a key mediator, demonstrating that SL enhances service excellence by fostering employees' psychological resources.

Among hotel salespeople, Bouzari & Karatepe (2017) revealed that PsyCap fully mediated the influence of SL on outcomes such as reduced lateness, increased service–sales ambidexterity, intention to remain, and service-oriented organizational citizenship behaviors. Further, in the Malaysian hotel sector, Batool et al. (2022) confirmed the partial mediation of resilience - a key component of PsyCap - in the link between SL and organizational sustainability. Moreover, data collected from 370 newly hired employees across 13 hotels in China revealed that PsyCap emerged as a significant mediator, demonstrating that servant leadership fosters affective commitment by enhancing employees' psychological resources (Zhou et al., 2024). These findings collectively underscore the pivotal role of PsyCap in translating the positive effects of SL into tangible benefits for both employees and organizations. Based on the critical analysis of recent studies, several gaps exist in the current literature on the relationship between servant leadership (SL), psychological capital (PsyCap), and workplace well-being (WPW), particularly in the hospitality industry. Although the positive impact of SL on WPW is well-documented, few studies have explored the psychological mechanisms through which SL fosters employee well-being. PsyCap is a potential mediator in this relationship; however, its exact role remains underexplored.

Furthermore, most existing studies on SL and WPW have been conducted in corporate or educational settings, with limited research in the hospitality industry, where employee experiences and challenges may differ significantly. Additionally, there is a need to examine whether PsyCap functions differently in high-turnover industries like hospitality. Moreover, the majority of studies on SL and WPW have been conducted in Western or Asian contexts, leaving Middle Eastern hospitality settings

largely underexplored. Accordingly, this study, grounded in Conservation of Resources (COR) theory and supported by empirical findings on the positive effects of SL on PsyCap and PsyCap on WPW, hypothesizes that a service-oriented leader, as an organizational resource, creates supportive and resource-rich environments by offering guidance, fairness, and emotional support, which may enhance employees' PsyCap. Employees with higher PsyCap are expected to experience greater WPW, highlighting its role as a mediator in the SL-WPW relationship. Hence, the following hypothesis is proposed:

H4: PsyCap significantly positively mediates the SL-WPW relationship.

Figure 1 demonstrates the study's theoretical framework.

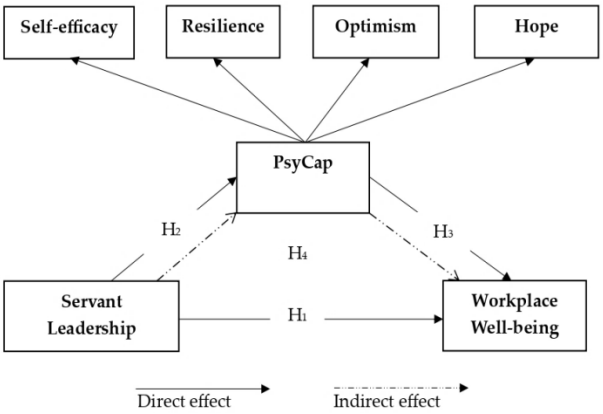


Figure 1. The study's theoretical framework

MATERIAL AND METHODS

Instruments and measures of the study

A cross-sectional survey was conducted to investigate the relationship among SL, and WPW, with the intervening role of PsyCap. A self-administered questionnaire, derived from a detailed literature review, was employed for data collection to ensure the inclusion of reliable and widely used measures. The survey was composed of four sections: the first gathered demographic characteristics. The second, third, and fourth sections assessed participants' perceptions of SL, PsyCap, and WPW respectively. To validate the content, three psychology experts and two hospitality management experts reviewed the questionnaire to ensure it effectively captured the intended variables. Additionally, a pilot test was conducted with 30 individuals who did not take part in the main study and was carried out to evaluate the clarity, simplicity, and consistency of the study's survey and identify any ambiguous terms or interpretations.

A seven-item instrument formulated by Liden et al. (2015) was utilized to measure the degree to which leaders exhibit characteristics focused on serving and supporting their team members. A Sample question used to evaluate SL is "My leader puts my best interests ahead of his/her own." To measure PsyCap, the study employed the CPC-12, a scale introduced by Lorenz et al. (2016) and later updated by Lorenz et al. (2022). The scale comprises four dimensions, each containing three items that reflect the respective resources. Self-efficacy items assess an individual's self-confidence and willingness to invest effort to accomplish complex tasks. A self-efficacy item states, "I can solve most problems if I invest the necessary effort.". Resilience items evaluate the employee's capacity to recover and persevere in the face of challenges and difficulties to achieve success. A sample of these items states, "When I'm in a difficult situation, I can usually find my way out of it." Optimism measures an employee's capacity to maintain a hopeful perspective and expect favorable outcomes in current and future situations. One item is "I am looking forward to the life ahead of me."

Finally, hope items measure a person's capacity to stay committed to their goals and adjust their strategies to achieve success. One item of this scale states. "I can think of many ways to reach my current goals." The items used to measure workplace well-being (PWB) were derived from the scale developed and validated by Pradhan & Hati (2022). A modified version of their nine-item scale was used to assess the WPW of participants, with one example item being "My workplace is very conducive." Generally, all the investigated participants rated their perceptions towards SL, PsyCap, and WPW on a five-point Likert scale where 1 means "strongly disagree" and 5 means "strongly agree".

Sampling and data collection

As mentioned before, this study aims to investigate the relationship among SL, and WPW, with the intervening role of PsyCap. Hence, participants were chosen using purposive sampling techniques. Purposive sampling refers to a non-probability method where participants are chosen deliberately for their knowledge, skills, or characteristics that are pertinent to the study (Etikan, 2016). In this technique, the researcher chooses individuals who are considered to provide the most useful or insightful information for addressing research questions or hypotheses. In this study, frontline employees in five-star hotels in Saudi Arabia were selected. These employees are the ones who interact directly with guests and are heavily influenced by leadership practices, especially servant leadership (Ozturk et al., 2021). While purposive sampling enhances the relevance of responses, it may limit generalizability, which is acknowledged as a study limitation.

The study focused on this category of employees for several reasons. First, frontline employees have more direct contact with managers and leaders, meaning they are more likely to experience and be influenced by servant leadership practices, such as empathy, empowerment, and ethical decision-making. Second, since frontline employees often face high-

pressure situations, leadership styles can significantly affect their sense of well-being. Their insights into SL practices can provide a more accurate representation of the impact on workplace well-being and psychological capital.

Before data collection, hotels located in Saudi Arabia's major cities, such as Jeddah, Riyadh, and Dammam, were chosen due to their high concentration of five-star properties. To gain access to participants, formal emails containing a research objective letter were sent to hotel management. Only ten hotels confirmed their participation.

For data collection, self-administered questionnaires were used. These were distributed during employees' break periods to ensure minimal disruption to their work schedules. The data collection was organized with the help of designated coordinators at each hotel (Figure 2). The guidelines provided by Nunnally & Bernstein (1994) were followed to establish the optimal number of participants for this research, which recommends a 1:10 ratio of items to participants.

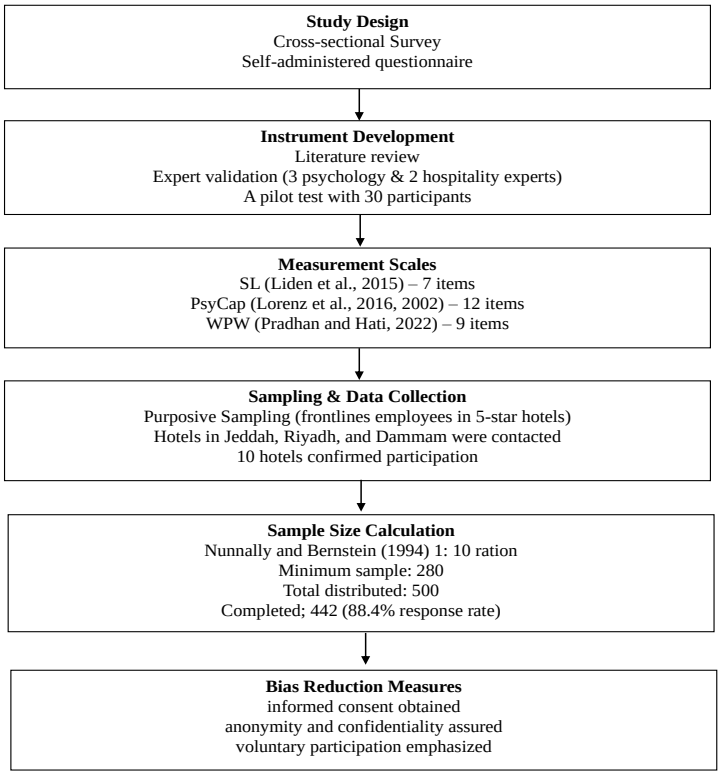


Figure 2. A flow chart of the methodology steps

Since the study involved 28 items, the minimum required sample size was 280 respondents. A total of 500 forms were distributed, and 442 completed questionnaires were returned, representing an 88.4% response rate deemed more than adequate.

Table 1. Participants' demographic details (N= 442)

Baseline characteristics	No.	%
Gender		
Male	365	82.6
Female	77	17.4
Age		
20 to 30 years	101	22.9
31 to 35 years	166	37.6
36 to 40 years	140	31.7
More than 40 years	35	7.8
Educational attainment		
High school or equivalent	139	31.4
Bachelor's degree	201	45.5
Postgraduate degree	102	23.1
Department		
Food & beverage	172	38.9
Housekeeping	143	32.4
Front Office	112	25.3
Other	15	3.4
Experience in this hotel		
Less than 3 years	89	20.1
From 3 to less than 5 years	182	41.2
From 5 to 10 years	122	27.6
More than 10 years	49	11.1

This sample size also aligns with Boomsma's (1984) recommendation of at least 200 samples for structural equation modeling. The demographic data of the participants are summarized in Table 1 and visually displayed in Figure 3.To minimize potential bias, the following measures were implemented. All participants provided informed consent before their inclusion in the study. They were assured of the anonymity and confidentiality of their answers, which encouraged honesty and reduced the likelihood of social desirability bias.

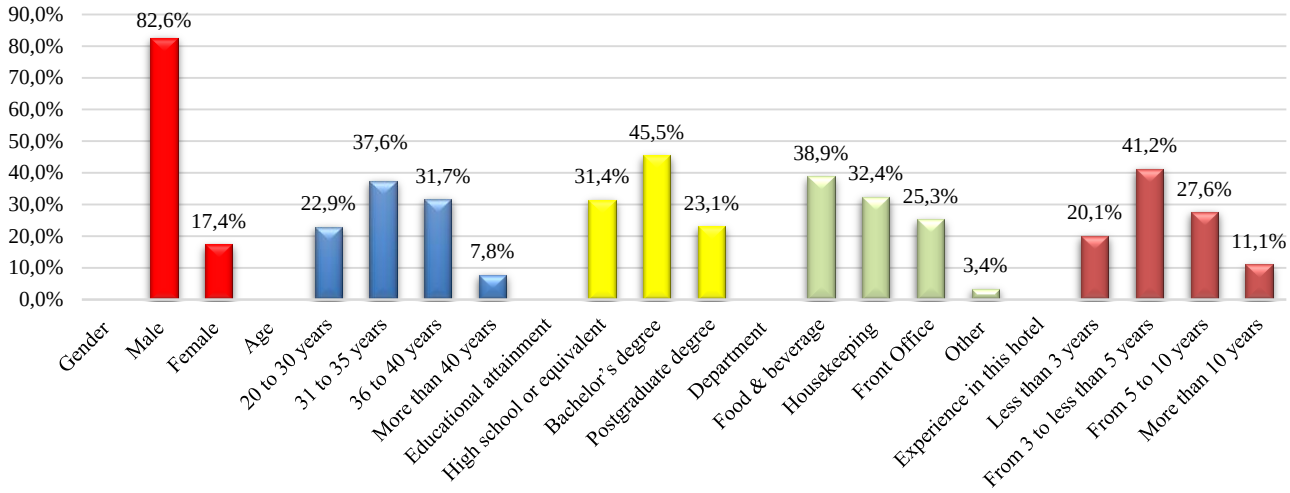


Figure 3. Participants' demographic details

Further, employees were informed that "participation was voluntary but encouraged." In addition, respondents were requested to share honest opinions, as the questionnaire did not have definitive right or wrong answers (Randall & Fernandes, 1991; Phillips & Clancy, 2002). From a statistical point of view, Harman's single-factor test (Podsakoff et al., 2003) was employed to assess common method bias (CMB), where a single factor explaining more than 50% of the variance indicates a problem. The exploratory factor analysis results in this study revealed that one factor accounted for only 42.7% of the variance, suggesting that CMB is not a concern. Finally, hotels from multiple regions were included to capture diverse perspectives across the Saudi hospitality industry.

Data Analysis

Our research utilized a two-step procedure, as advised by Hair et al. (2019). The first step involves the assessment of the measurement model to examine its psychometric properties, such as validity and reliability. PLS-SEM was utilized for this issue. In the second step, we assessed the structural model including direct and indirect hypothesized paths. The bootstrapping technique was employed to verify the significance of the direct and mediating effects.

RESULTS

Measurement model assessment

As previously stated, PLS-SEM was used to assess the measurement model. Hair et al. (2019) identified four key steps for evaluating the measurement model. First, the evaluation of the indicator loadings. Indicator loadings greater than 0.708 are recommended. According to Table 2, all standardized indicator loadings (SIL) are significant and meet the threshold value (e.g. SIL ranged from 0.717 to 0.986). Second, internal consistency reliability was assessed. To ensure this, composite reliability (CR) and Cronbach's alpha (α) values higher than 0.70 are suggested. Table 2 reveals that all CR values for SL, PsyCap, and WPW are above 0.70, with a range between 0.944 (SL) and 0.964 (PsyCap), demonstrating high reliability. Similarly, the results for α values show strong internal consistency, with values ranging between 0.903 (SL) and 0.953 (PsyCap). Third, the convergent validity (CV) was addressed.

Table 2. Constructs' reliability, and validity measures

Construct	Items	SIL	Cronbach's Alpha	CR	AVE
Servant leadership (SL)	SL1	0.726***	0.903	0.944	0.710
	SL2	0.819***			
	SL3	0.872***			
	SL4	0.717***			
	SL5	0.918***			
	SL6	0.904***			
	SL7	0.916***			
Psychological Capital (PsyCap)			0.959	0.964	0.689
Optimism	PsyCap1	0.914***	0.907	0.942	0.843
	PsyCap2	0.892***			
	PsyCap3	0.948***			
Resilience	PsyCap4	0.878***	0.922	0.951	0.867

Construct	Items	SIL	Cronbach's Alpha	CR	AVE
	PsyCap5	0.941***			
	PsyCap6	0.971***			
Self-efficacy	PsyCap7	0.961***	0.969	0.980	0.942
	PsyCap8	0.965***			
	PsyCap9	0.986***			
Hope	PsyCap10	0.963***	0.939	0.961	0.892
	PsyCap11	0.929***			
	PsyCap12	0.942***			
Workplace wellbeing (WPW)	WPW1	0.859***	0.936	0.954	0.700
	WPW2	0.910***			
	WPW3	0.892***			
	WPW4	0.883***			
	WPW5	0.812***			
	WPW6	0.890***			
	WPW7	0.772***			
	WPW8	0.771***			
	WPW9	0.720***			

Note: SIL= Standardized indicator loading, Cr= composite reliability, AVE= average variance extract, ***: $p < 0.001$

The CV was established based on the average variance extracted (AVE), where a value of 0.50 or greater is considered acceptable. Table 2 reveals that all AVE values are above the threshold, confirming that CV is supported.

Fourth, discriminant validity (DV) was examined according to Henseler et al.'s (2015) recommendations. They note that DV problems arise when HTMT values surpass 0.90. Table 3 shows that no HTMT values exceed the 0.90 threshold, confirming that DV is not an issue in this study.

Table 3. HTMT discriminant validity (Note: HTMT less than 0.90)

Construct	**PsyCap**	**SL**	**WPW**
PsyCap			
SL	0.574		
WOW	0.620	0.580	

Table 4. Structural parameter estimates (Note: ***: $p < 0.001$)

Hypothesized Path	**Original Sample (O)**	**Sample Mean (M)**	**Standard Deviation (STDEV)**	**T Statistics**	**Confidence Intervals**		**Results**
					2.5%	**97.5%**	
Direct effect							
SL -> WPW	0.427	0.432	0.053	8.063	0.324	0.534	Accepted
SL -> PsyCap	0.682	0.685	0.023	29.666	0.638	0.728	Accepted
PsyCap -> WPW	0.323	0.319	0.056	5.764	0.206	0.425	Accepted
Indirect effect							
SL -> PsyCap -> WPW	0.221	0.219	0.040	5.458	0.139	0.296	Accepted

Testing hypotheses: structural parameter estimates

In this study, the researcher utilized PLS-SEM to test the proposed hypotheses. The bootstrapping method, with 5,000 iterations, was employed to gauge the strength and significance of the path coefficients. The results reveal that all direct and indirect paths were significant and positive, validating the study's hypotheses (Table 4 and Figure 4).

The results displayed in Table 4 and Figure 4 highlight the direct relationships between SL and WPW, SL and PsyCap, as well as PsyCap and WPW. In addition, the findings further shed light on PsyCap as a mediator in the connection between SL and WPW. More specifically, concerning the SL-WPW relationship, the results outlined in Table 2 indicate that SL is significantly positively correlated to WPW ($\beta = 0.427$, $t = 8.063$, $p < 0.001$), supporting hypothesis 1. This finding indicates that a higher level of servant leadership is positively associated with workplace well-being.

Further, in terms of the SL-PsyCap relationship, the analysis confirms that SL also exhibited a strong positive effect on PsyCap ($\beta = 0.682$, $t = 29.666$, $p < 0.001$), confirming Hypothesis 2. The magnitude of this effect suggests that SL plays a crucial role in enhancing employees' psychological resources. Similarly, the study's empirical evidence supports a significant positive effect of PyCap on perceived WPW ($\beta = 0.323$, $t = 5.764$, $P < 0.001$), thus confirming Hypothesis 3. This result underscores the importance of psychological capital in shaping employees' perceptions of well-being at work.

Regarding the indirect impact of SL on WPW via perceived PsyCap, bootstrapping results indicate that PsyCap acts as a significant intervening variable in the interrelationship among SL and WPW ($\beta = 0.221$, $t = 5.458$, $p < 0.001$), confirming H4. The 95% confidence interval (0.139 – 0.296) does not include zero, further assuring the mediation effect. In line with Zhao et al. (2010) guidelines for mediation analysis, with both H1 and H4 showing significant support, results confirm that PsyCap partially mediates the relationship between SL and WPW. This result highlights that servant leadership (SL) significantly predicts psychological capital, which, in turn, positively influences employees' workplace well-being (WPW).

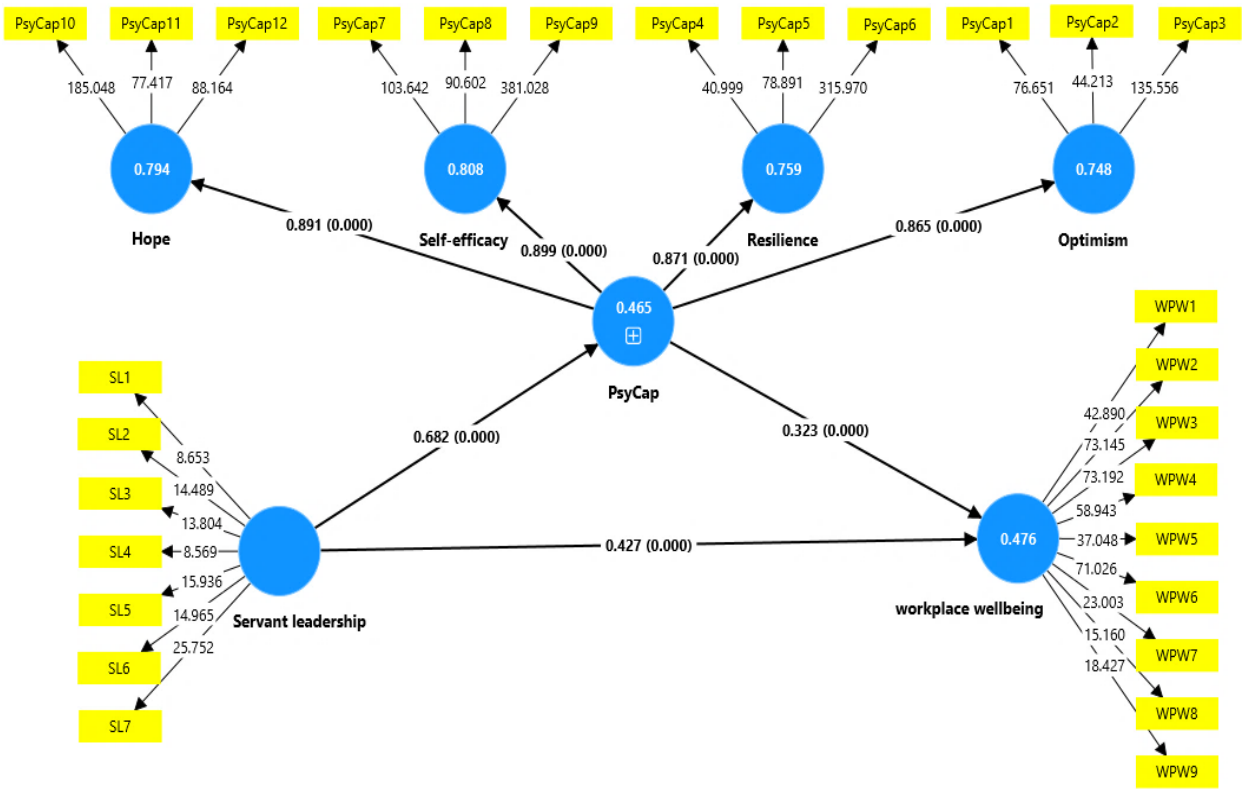


Figure 4. Structural model (Note: Numbers inside the circles signify the R^2 values)

The findings in Figure 4 highlight R^2, the coefficient of determination, which assesses the predictive power within the sample, reflecting the influence of exogenous constructs on endogenous ones (Rigdon, 2012; Hair et al., 2019). According to Hair et al. (2019), R^2 values are categorized as weak at 0.25, moderate at 0.50, and substantial at 0.75. The R^2 value of 0.465 for SL's impact on PsyCap indicates that SL explains 46.5% of the variation in PsyCap, demonstrating moderate predictive power. Additionally, the R^2 value for the combined effect of SL and PsyCap as a mediator on WPW is 0.476, indicating that the model explains 47.6% of the variance in WPW, reflecting a moderately predictive model.

These results affirm that servant leadership not only directly enhances workplace well-being but also does so indirectly by fostering employees' psychological capital, a key resource that helps them navigate workplace challenges.

DISCUSSION

This research proposed and empirically validated a model examining the interrelationships between servant leadership (SL), psychological capital (PsyCap), and workplace well-being (WPW) among frontline employees in the hospitality industry. All the study's hypotheses were validated, and several noteworthy findings emerged. First, the findings underscore the pivotal role of SL in predicting WPW. The significant positive association between SL and WPW ($\beta = 0.427$, $t = 8.063$, $p < 0.001$) confirms Hypothesis 1, illustrating that servant leaders who prioritize their employees' needs, offer guidance, and act as role models positively impact employees' overall well-being. This finding aligns with prior research (e.g. Coetzer et al., 2017; Ortiz-Gómez et al., 2022; Roberts, 2021; Song et al., 2024; Swanson et al., 2022; Westbrook et al., 2022; Zeng et al., 2022) that links servant leadership to favorable employee outcomes, emphasizing its potential in creating a supportive and thriving organizational environment.

Second, the strong positive interplay between SL and PsyCap ($\beta = 0.682$, $t = 29.666$, $p < 0.001$) validates Hypothesis 2, supporting the idea that servant leadership significantly contributes to the development of employees' psychological resources. These resources include key dimensions such as optimism, hope, resilience, and self-efficacy—core elements of PsyCap that enhance employees' ability to cope with challenges and pursue goals with a positive mindset. This result aligns with existing literature on servant leadership, which emphasizes the role of leaders as an organizational resource that can significantly enhance the psychological capital of employees, making them more resilient, optimistic, hopeful, and self-efficacious in their roles (Brohi et al., 2021; Jan & Iman, 2024; Gui et al., 2021; Safavi & Bouzari, 2020).

Third, the study's findings also demonstrated the significant positive effect of psychological capital (PsyCap) on workplace well-being (WPW) ($\beta = 0.323$, $t = 5.764$, $p < 0.001$) confirming Hypothesis 3. This result indicates that frontline employees exhibiting higher levels of PsyCap tend to have better well-being in the workplace. This finding reinforces the importance of nurturing psychological resources, as they contribute significantly to employees' overall satisfaction and mental health within the workplace. This finding also supports the works of Amish & Biswal (2024), Rengganis et al. (2024), Sun et al. (2022), and Youssef-Morgan & Luthans (2015), revealing that PsyCap has emerged as a crucial source in promoting positive outcomes in the workplace. Employees who are more optimistic about their tasks, resilient in the face of challenges, hopeful about achieving their goals, and confident in their ability to succeed are better equipped to exhibit greater levels of engagement and job satisfaction, as well as navigate workplace demands more effectively. This, in turn, leads to improved well-being.

Fourth, regarding the mediation effect of PsyCap in the SL-WPW association, the bootstrapping results confirm that PsyCap significantly and partially mediates the SL-WPW relationship ($\beta = 0.221$, $t = 5.458$, $p < 0.001$), providing strong support for Hypothesis 4. This partial mediation offers valuable insights into the complex mechanisms through which SL influences WPW, highlighting the pivotal role of psychological capital (PsyCap) as a key mediator. This finding aligns with broader literature, which confirms the significant mediating influence of PsyCap in the connection between SL and various positive outcomes (Battol et al., 2022; Baykal, 2020; Clarence et al., 2021; Gao & Huang, 2024). This finding reinforces the proposed theoretical framework, suggesting that a servant leader acts as a critical organizational resource, fostering supportive and resource-rich environments by providing guidance, fairness, and emotional support, thereby enhancing employees' PsyCap, which subsequently improves their workplace well-being.

THEORETICAL AND PRACTICAL IMPLICATIONS

Theoretical implications

Through a theoretical lens, the present study provides valuable insights into the existing literature in several ways. First, the findings enrich the body of research on servant leadership (SL) by demonstrating its significant positive impact on psychological capital (PsyCap) and workplace well-being (WPW). These findings extend theoretical perspectives, such as the Conservation of Resources (COR) theory, which posits that leaders can serve as resource generators.

By confirming PsyCap's mediating role, the study highlights SL's dual pathway of influence—both direct and indirect—on WPW, offering a nuanced understanding of how leadership styles contribute to employee well-being. Second, the study's findings, particularly in the hospitality industry context, underscore the substantial role of PsyCap as a critical psychological resource mediating the relationship between SL and WPW.

This supports existing theories (e.g., COR theory) by showing how psychological resources like optimism, hope, resilience, and self-efficacy function as essential mechanisms through which leadership practices influence workplace well-being. Third, the findings validate the integration of SL, PsyCap, and WPW into a cohesive theoretical framework. This integration advances leadership studies by presenting a comprehensive model that connects leadership practices, psychological resources, and employee well-being.

Practical implications

Practically, the following suggestions should be considered. First, hotel management should prioritize training programs that foster servant leadership traits such as empathy, empowerment, and ethical behavior. Leaders equipped with these qualities can create supportive environments that enhance employees' PsyCap and overall well-being, leading to higher engagement and productivity. Second, investing in initiatives that build employees' PsyCap - through workshops, mentoring, and well-being programs - can result in significant improvements in workplace satisfaction and mental health. The findings highlight PsyCap as a critical tool for managing workplace stress and enhancing resilience, optimism, and goal attainment. Third, given the study's focus on frontline employees, hospitality organizations should implement tailored interventions to address the unique challenges faced by these workers.

Enhancing leadership support and psychological resources for employees in high-stress roles can improve service quality and customer satisfaction. Fourth, incorporating servant leadership principles into organizational policies and strategic goals can positively influence employee outcomes. Policies that prioritize leadership accountability and psychological resource development can help create a thriving and sustainable workplace culture.

Fifth, updating organizational policies to prioritize employee well-being—including transparent communication, equitable treatment, and consistent recognition of employee contributions—is essential. Finally, organizations in the hospitality industry should emphasize hiring and promoting leaders with servant leadership qualities. Including behavioral assessments in recruitment processes to identify servant leadership traits, alongside offering ongoing leadership development programs to cultivate these qualities, should be prioritized.

Limitations of the study and further research

This study has some limitations as follows. First, the study relied on a cross-sectional research design, which limits the possibility of concluding causality. Longitudinal designs should be utilized in future research to determine better causal relationships among servant leadership, psychological capital, and workplace well-being. Second, the study was conducted within the hospitality industry in Saudi Arabia, focusing on frontline employees. This limits the extent to which the findings can be applied to other industries or cultural environments.

Further research incorporating different industries and cultural settings could broaden the applicability of these results. Third, the study mainly focused on PsyCap as an intervening factor in the association between SL and WPW. Testing other potentially influential variables, such as perceived organizational support, emotional intelligence, organizational trust as well as demographic variables, may influence the relationships between SL and WPW.

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Conflicts of Interest: The authors declare no conflict of interest.

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THE RELATIONSHIP BETWEEN INVESTMENT IN INNOVATION AND FINANCIAL SUSTAINABILITY: AN EMPIRICAL STUDY OF COMPANIES IN THE IBERIAN PENINSULA

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Abstract: Sustainability, as defined by the United Nations' 17 Sustainable Development Goals (SDGs), necessitates responsible corporate practices that enhance long-term value and attract investors seeking sustainable performance. This study examines the causal relationship between investment in innovation and financial sustainability, an area where prior research remains inconclusive. The sample consists of 51 companies listed on the PSI (Portugal) and IBEX-35 (Spain) indices between 2011 and 2022. To analyse this relationship, the study employs multiple linear regression models with panel data, ensuring robust statistical inference. The Hausman test determined that a fixed-effects least squares approach was the most appropriate estimation method. Key findings indicate that financial sustainability positively influences innovation investment when lagged by one and two periods, but not in the current period. This suggests that investors and financiers require time to evaluate financial stability before allocating funds to innovation. Conversely, investment in innovation significantly impacts financial sustainability but in a dynamic and time-dependent manner. In the current and previous periods, the effect is negative, indicating that initial innovation expenditures might strain financial resources. However, two periods later, the impact becomes positive, reflecting the long-term benefits of innovation on financial health. Macroeconomic factors also play a role. Gross Domestic Product (GDP) significantly affects both financial sustainability and innovation investment, emphasizing the broader economic context in corporate decision-making. However, company size does not show a significant impact, suggesting that the innovation-finance relationship is not necessarily dependent on firm scale. Profitability indicators, such as return on assets (ROA) and return on equity (ROE), positively influence financial sustainability. However, they do not appear to drive investment in innovation, implying that firms do not directly reinvest profits into R&D. These findings offer important implications for managers, investors, and policymakers, advocating for strategies that balance financial sustainability with innovation investment. Aligning corporate policies with the UN SDGs can promote sustainable development, ensuring long-term economic resilience and environmental responsibility.

Keywords: investment in innovation, sustainable investment, financial sustainability, return on assets, return on equity

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INTRODUCTION

Currently, the issue of sustainability has become a central concern, both for society and companies. The creation by the United Nations (UN) of the 17 Sustainable Development Goals (SDGs) represents a historic milestone in the search for a fairer, more equitable and sustainable global future. These objectives act as a guide to face global challenges, such as climate change, social inequalities and sustainable management of natural resources. At the same time, companies face increasing pressure to adopt responsible practices that minimize negative impacts on the environment and society, but also add value to financial results. The relationship between sustainable investment and/or innovation and business results is, therefore, an area of research with increasing relevance. A sustainable investment can have different dimensions: (1) environmental, with the objective of protecting and preserving the environment, such as excluding operational activities

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harmful to the environment, adopting sustainable practices with the use of renewable energy and production processes with energy efficiency and other resources; (2) social, which evaluates the company's effect on the environment, such as respect for human and workers' rights, promoting health, safety, diversity and inclusion and (3) cooperative, which aims to evaluate the quality of management, particularly in terms of standards ethical, to ensure corporate responsibility (UN, 2015).

Investors and financiers also play a key role in opting for companies that incorporate sustainable practices (Xu & Chen, 2020). Firstly, because they are contributing to social and environmental well-being, contributing to a more sustainable society. Second, studies indicate that companies with sustainability concerns present less volatility in the face of economic risks, hence these companies tend to outperform others in terms of financial performance and present more stable returns in the long term (Eccles et al., 2014). Investors, especially institutional ones, when considering the sustainability of companies in their investment decisions, inducing companies to behave in the same way (Eccles et al., 2014). According to a study by the CFA Institute Centre for Financial Market Integrity (2017), almost ¾ of portfolio managers and financial analysts consider companies' corporate performance in investment decisions. It should also be mentioned that managers are currently witnessing a growing awareness of company sustainability as legislation emerges on the subject and regulators require companies to disclose their sustainability practices (Eccles & Serafeim, 2013). Given the current trend, sustainable investing and sustainable finance are closely related. There is growing evidence that environmental, social and cooperative considerations must be in line with financial objectives, but must also improve financial performance and reduce long-term risks (Eccles & Serafeim, 2013; Eccles et al., 2014; Kölbel et al., 2020). This perspective has been analysed in academic literature. Recently, studies have emerged that find that investment in innovation improves sustainability, productivity and company results and, consequently, financial sustainability (Plank & Doblinger, 2018; Xu et al., 2020).

Given the above, this study aims to analyse the bidirectional relationship between investment in innovation and financial sustainability. The mutual influence of the two variables is analysed. Additionally, it is analysed whether other variables have explanatory capacity for investment in innovation and financial sustainability. To pursue this objective, two models with panel data are estimated using a sample of companies listed in the two markets of the Iberian Peninsula.

The investment decision is reflected in the company's profitability (Lv et al., 2021). The funds required for investment are high and are not recovered in the short term, so investment decisions must be well thought out to avoid causing insolvency/bankruptcy (Rosa & Mukhibad, 2022). There are also other factors that explain the relevance of this study and that differentiate it from existing studies. First, the sample analysed, composed of companies listed in the two regulatory markets of the Iberian Peninsula. There is a lack of studies focused on the companies under analysis, which are practically non-existent. The companies analysed are inserted in a society in which cooperative social responsibility, as well as the 17 UN SDGs, are not yet very rooted. In comparison, companies from other countries/studies, whose awareness among managers, investors and financiers is widespread. Second, understanding the relationship between investment in innovation and sustainable finance is essential for different groups such as managers, investors, researchers and public policy makers. The government can benefit from the results of this study by helping to formulate policies that promote sustainable growth in line with the 17 UN SDGs. For investors and academics, it helps make more informed decisions about resource allocation, identifying investment opportunities and contributing to sustainable development.

This analysis also reinforces the importance of thoughtful investment decisions, given that investments in innovation often involve high initial costs and long-term returns. These decisions must be carefully planned to avoid risks of insolvency or bankruptcy (Lv et al., 2021; Rosa & Mukhibad, 2022). Finally, understanding the interrelationship of investment in innovation and financial sustainability is crucial to promoting business practices that benefit not only companies, but society as a whole, contributing to more balanced and sustainable global development. The article is organized as follows. In this section, the topic, relevance and objectives of the research are introduced. Section 2 presents the literature review. Subsequently, in sections 3 and 4, the methodology and sample used are presented, respectively. Section 5 presents and analyses the empirical results and the discussion and conclusions are presented in section 6.

LITERATURE REVIEW

Over time, several authors have contributed significantly to the development of the concept of corporate social responsibility (CSR). Bowen (1953), considered the father of CSR, argues that companies and/or managers, in addition to economic responsibilities, must also have social responsibilities. However, it was in the 70s that the concept developed the most. Davis (1973) argues that responsibility begins where the law ends. The company is not socially responsible if it only complies with the minimum requirements of the law because that is what any good citizen would do. The author expands the concept of corporate responsibility beyond economic, contractual or legal obligations. Social responsibility must be proportional to corporate power, that is, the greater the power of a company, the greater its social responsibility.

Later, Carroll (1979) was a pioneer in proposing a more structured approach to CSR, which culminated in his famous four-dimensional model: economic responsibility, legal responsibility, ethical responsibility and philanthropic responsibility. This model evolved in the 90s, when Carroll (1991) developed it in four dimensions through a pyramid, hierarchizing the four dimensions in the pyramid. At the base of the pyramid is economic responsibility as the basis for the development of other responsibilities. At the top of the pyramid is philanthropic responsibility. In the 1980s, Freeman (1984) introduced the stakeholder model. For the author, the company must create value for all groups, internal and external stakeholders, and not just for shareholders. In the same line of thought, Elkington (1998) argues that companies must have social responsibilities not only towards their owners, but also towards their stakeholders, such as employees, customers, communities and the environment in which they operate. At the end of the 90s, Carroll (1999) presents the historical evolution, from 1950 to 1990, of the concept of CSR, highlighting its importance in business activity.

These authors, as well as others, notably more recent ones, contributed to the evolution of the CSR concept, which went from a purely economic vision to an integrated approach, considering the responsibilities of companies in relation to their stakeholders and society as a whole. Currently, there is a growing awareness in society that has driven a movement towards corporate sustainability. Investing sustainably, integrating environmental, social and cooperative (CSR) considerations into financial decisions is an increasingly important practice in the world of finance (Xu et al., 2020).

The relationship between innovation/sustainable investment and sustainable finance is complex and multifaceted and has been the subject of study and analysis by several authors. The objective is for companies to seek to balance not only economic interests, but also the social, environmental and cooperative impacts of their operational activity.

There are several studies on the relationship between investment in innovation and financial sustainability, however there is still no consensus on the relationship between these variables (Xu et al., 2020). While some studies suggest a positive association between the two variables (Khan et al., 2015; Xu et al., 2019; Plank & Doblinger, 2018; Saunila & Ukko, 2014), others find mixed or even negative results (García-Sánchez & García-Meca, 2018). Liang et al. (2002) find that companies that are growing and invest in innovation present increasing results with long-term effects. Investment in innovation, particularly in small and medium-sized companies, has positive effects on financial sustainability. Investment in innovation is related to productivity and allows companies to obtain better performance and higher returns compared to companies that do not make this investment (Hall & Mairesse, 1995; Wang et al., 2015; Lassala et al., 2017).

However, the impact of investment in innovation may vary from company to company, depending on a series of factors, such as the sector in which it operates, the innovation strategy adopted and the legislative environment in which the company operates (Bowen et al., 2010; Zhu & Zhao, 2022; Lin et al., 2019). In view of the above, although there is evidence of a generally positive association between investment in innovation and financial sustainability, this relationship may be more complex as it depends on several factors. Currently, investors are not only looking to maximize their investment but also want to contribute to a better world, they prefer investments that comply with ethical values and sustainable investments (Linnenluecke & Daugoard, 2023). This change in investor preference is transforming the financial landscape, influencing policies and practices in companies, financial analysts and financiers, contributing to responsible investment practices (Flammer, 2015; Uzsoki, 2020). When managers decide to invest, they will have to analyse the risks and opportunities inherent to the investment, to highlight the analysis of non-financial risks, related to reputation and environmental regulation (Margolis & Walsh, 2003; Tseng et al, 2019).

Company size is a potentially explanatory variable for both financial sustainability and investment decisions, especially in projects related to innovation. Larger companies generally have more resources and easier access to external capital, whether debt or own, allowing them to finance investments more efficiently (Grilli & Murtinu, 2014).

In contrast, as company size has decreased, additional challenges arise that make the decision-making process more complex. Smaller companies present difficulties such as: (1) lower self-financing capacity, due to lower internal generation of resources and (2) greater restrictions on external financing, either due to difficulties in accessing third-party capital or the perception of greater risk by investors when providing own capital. These financial limitations can restrict the amount available for new investments and, consequently, inhibit initiatives to invest in innovation, which often require considerable resources and present high risks (Andries & Czarnitzki, 2014; Chen et al., 2023).

The decision to make this type of investment in smaller companies requires a more careful analysis, considering the potential impacts on cash flow and capital structure. Thus, the size of the company not only influences financial sustainability but also the ability to finance new projects, with repercussions on investment decisions in innovation. Beck & Demirguc-Kunt (2006) argue that there is a positive relationship between company size and investment in innovation.

Return on equity (ROE) and return on assets (ROA) are two indicators that influence the company's financial sustainability and consequently the ability to invest in innovation. A high return on equity indicates that the company generates significant profits in relation to the capital invested by shareholders, which can attract new investments and, thus, facilitate access to financing for investment in innovation. A high return on assets demonstrates a company's efficiency in using assets to generate profits, which can free up funds for investment in innovation. From the above, companies with high return on equity and return on assets tend to have greater financial flexibility, allowing them to allocate resources for research and development without compromising their financial stability (Palepu et al, 2020; Smart et al, 2018).

Fama & French (1993) find that companies with high return on assets (ROA) and return on equity (ROE) tend to attract more investments and, consequently, boost ROA and ROE. Thus, the relationship between the two variables, investment and return, is circular. Companies that invest strategically increase return on equity and return on assets and are more likely to achieve long-term financial sustainability (Uzsoki, 2020). Companies that publicly report their sustainability initiatives tend to have better financial sustainability, including better ROA and ROE, suggesting that investment in innovation can create long-term shareholder value (Eccles et al., 2014).

There is therefore an interrelationship between investment in innovation and profitability, demonstrating the importance of considering CSR criteria in investment decisions to promote long-term sustainability. The literature highlights the growing importance of companies adopting sustainable practices not only as a matter of social responsibility, but also as a smart business strategy, as it contributes to increasing return on assets and return of equity.

Some studies argue for the existence of an interdependent cycle between the financial health of companies, investment and economic activity. Business investment is characterized by its volatility and depends heavily on the performance of the economy. At the same time, the financial health of companies and the resulting level of investment also influence the economic cycle, creating a dynamic and continuous cycle, whose starting point is not easily identified (Farinha & Prego, 2013).

Investment decisions and company financial sustainability cannot be dissociated from macroeconomic conditions. Therefore, variables such as Gross Domestic Product (GDP) are often used to understand this relationship (Nunes et al., 2012). The gross domestic product is an important indicator of economic activity and reflects the influence of several factors, such as government policies, market expectations, and sectoral conditions. These factors directly affect companies' investment decisions and, consequently, their financial results (Nunes et al., 2012).

Being sustainable not only contributes to the well-being of society and the environment, but should also improve financial results, as well as providing the company with greater competitiveness in the market. Therefore, investment in innovation offers companies powerful tools to improve their financial sustainability, allowing them to more efficiently make more informed decisions and adapt to market changes and stakeholder expectations. These relationships are the object of analysis in this study, but applied to companies from countries for which studies are scarce or non-existent.

METHODOLOGY

The objective of this article is to analyse the relationship between investment in innovation and financial sustainability in listed companies in the Iberian Peninsula. Additionally, the existence of other variables, accounting and macroeconomics, that can explain these two variables is analysed. To this end, the following research hypotheses are stated:

[H_1] -	Financial sustainability has a positive and significant effect on investment in innovation in listed companies in the Iberian Peninsula.
[H_2] -	There are other variables, accounting and macroeconomic, referenced in the literature that explain investment in innovation in listed companies in the Iberian Peninsula.
[H_3] -	Investment in innovation has a positive and significant effect on financial sustainability in listed companies in the Iberian Peninsula.
[H_4] -	There are other variables, accounting and macroeconomic, referenced in the literature that explain financial sustainability in listed companies in the Iberian Peninsula.

To test the research hypotheses, two regressions are estimated, with panel data, represented by the following equations (Cumming et al, 2016):

$$INVI_{i,t} = \beta_0 + \beta_1 FS_{i,t} + \beta_2 FS_{i,t-1} + \beta_3 FS_{i,t-2} + \beta_4 SIZE_{i,t-1} + \beta_4 ROA_{i,t-1} + \beta_5 ROE_{i,t-1} + \beta_6 GDP_{t-1} + \varepsilon_{i,t} \quad (1)$$

$$FS_{i,t} = \beta_0 + {}_1 INVI_{i,t} + \beta_2 INVI_{i,t-1} + \beta_3 INVI_{i,t-2} + \beta_4 SIZE_{i,t-1} + \beta_4 ROA_{i,t-1} + \beta_5 ROE_{i,t-1} + \beta_6 GDP_{t-1} + \quad (2)$$

In which the lower indices i and t refer to the company and the year, respectively, the coefficient β_0 is the regression constant, which represents what is not explained by the explanatory variables included in the model and $\varepsilon_{i,t}$ is the disturbance term random model of the company in period t.

The proxy for investment in innovation (INVI) is the same used in other studies, which consists of the quotient between research and development spending and the company's operating result in the same period (Cumming et al, 2016).

Company financial sustainability (FS) measures the company's ability to use resources to obtain returns. This research uses the financial sustainability proxy proposed by Higgins (1981) and used by other authors (Xu et al., 2020).

FS is measured as the product of four indicators: sales margin, asset turnover, payout ratio and capital multiplier, according to equation (3) (Cumming et al., 2016).

$$FS = SM \times AT \times P \times CM \quad (3)$$

The sales margin (SM) is measured by the quotient between gross sales profit and sales (turnover). Gross profit from sales is the difference between sales and the cost of goods sold. This indicator evaluates the operational efficiency of a company's sales in relation to its sales. Asset turnover (AT) is measured by the ratio between revenue and total assets, which evaluates the efficiency with which a company uses its assets to generate sales. If this index presents a high value it indicates that the company is generating more revenue for each unit of asset invested, which suggests an efficient use of the resources available to the company. The payout index (P) is measured by the quotient between dividends and net profit for the year, which evaluates the proportion of a company's net profit that is allocated to dividends. This index is important for investors, as it indicates what proportion of the company's results are distributed. A high payout ratio can be attractive to investors seeking regular returns. However, a high ratio may be unsustainable in the long term, as the company may need to retain part of the profits to reinvest in its activity, particularly in investment in innovation or to face financial challenges. This index must be a compromise between the profitability of its capital holders and the company's investment needs.

The capital multiplier (CM) is measured by the quotient between total assets and net equity, also known as the grain of financial leverage. This indicator assesses the stability of the company's financial structure and the relationship between the interests of shareholders and creditors. A high value for this index suggests greater dependence of the company on debt capital (liabilities), hence greater financial risk as the company is more exposed to the cost of debt capital.

Other variables, accounting and macroeconomic, are also analysed as potentially explanatory of the explained variables, INVI and FS, which were analysed in some empirical studies. The accounting variables are: (1) company size (SIZE), from the natural logarithm of the company's total assets, (2) return on assets (ROA) from the quotient between net profit and assets, which evaluates efficiency of the company in generating results with the total capital made available by the company, and (3) return on equity (ROE) of the quotient between net profit and net equity, which evaluates the efficiency of the company in generating results with the capital made available by the company's capital holders, thus allowing capital holders to know the profitability of their investments. The macroeconomic variable is the gross domestic product, (GDP), the average annual rate of variation of the gross domestic product at market prices of the two countries on the Iberian Peninsula, weighted by the number of companies in the sample from each country. The company's variables depend on its size, a fact that justifies the use of these variables, explained and explanatory, in a quotient to be normalized against the sample. Equation (1) allows us to verify the first two hypotheses and equation (2) the last two research hypotheses.

The EViews Software - version 7 is used to estimate the models and the least squares method is used with panel data, through fixed effects or variable effects according to the results obtained in the Hausman statistical test. If in this test, the null hypothesis is not rejected, at a statistical significance level of 5%, the model is estimated using variable effects, otherwise, that is, if the null hypothesis is rejected, the model is estimated using variable effects fixed effects.

When evaluating the quality of models, some statistical tests are used: (1) individual significance test of model parameters, T-student statistics, (2) coefficient of determination (R^2) and/or adjusted coefficient of determination (R^2a), and (3) global significance test of the model based on F statistics. The level of statistical significance used in statistical tests is 5%.

Sample

The sample used in this study is made up of companies listed in the two European countries that make up the Iberian Peninsula, Portugal and Spain. The analysis period is between 2011 and 2022, totalling 12 years of annual observations. Data were extracted from all companies that make up the Portuguese and Spanish stock market index, PSI and IBEX-35, 16 and 35 companies, respectively. This selection results in a sample composed of 51 companies over 12 years, which makes a total of 612 annual observations. The descriptive statistics and correlation coefficients of the variables under analysis are presented in Table 1. The table presents the descriptive statistics: mean, standard deviation and p-value, as well as the correlation coefficients of the explanatory variables proposed in the models, in the period from 2011 to 2022 of the companies that are part of the PSI and IBEX-35 index. The variables are: (1) financial sustainability -FS of the product of four indicators; sales margin (quotient between gross profit from sales and sales), asset turnover (quotient between revenue and the company's total assets), payout index (quotient between dividends and net profit) and capital multiplier (quotient between total assets and net equity), (2) Investment in innovation - INVI of the ratio between research and development expenses and operating profit, (3) return on assets - ROA of the ratio between net profit and assets, (4) return on equity - ROE of the ratio between net profit and equity, (5) company size - SIZE of the natural logarithm of assets and (6) gross domestic product (GDP) of the average rate of change annual gross domestic product at market prices of the two countries on the Iberian peninsula, weighted by the number of companies in the sample from each country.

Table 1. Descriptive statistics and correlation coefficients of analysed variables

Variable	Descriptive Statistics			Correlation Coefficients					
	Mean	Std.Dev	P-value	FS	INVI	ROA	ROE	SIZE	GDP
FS	**0.8568**	2.5339	0.0453	1					
INVI	**0.6534**	2.8581	0.0307	0.002	1				
ROA	**0.1049**	2.0483	0.0004	0,003	0.001	1			
ROE	0.1314	8.7079	0.6501	0.201	0.067	0.044	1		
SIZE	**13.038**	2.1062	0.0000	0.031	0.123	0.163	-0.001	1	
GDP	**0.0544**	0.05393	0.0000	0.075	0.114	0.012	0.028	0.001	1

The p-value corresponds to the statistical test of the null hypothesis: the mean of the explanatory variable is equal to zero. Means statistically different from zero, at a statistical significance level of 5%, are marked in bold.

In the T test for a statistical significance level of 5% (Table 1), the null hypothesis that the mean of the explanatory variables analysed is equal to zero is rejected. There is only one exception for the return on equity variable that does not reject the null hypothesis, that is, the mean return on equity is statistically equal to zero for a statistical significance level of 5%.

The variables analysed, except for gross domestic product, are very volatile and have a standard deviation greater than their average. These values indicate a large variability in data from the companies in the sample. The efficiency with which companies use their assets to generate results (measured by ROA) presented an average of 10.49%. However, the standard deviation of this variable is considerably higher than the average, which highlights significant differences in the management of companies and the resulting ability to generate returns on their assets. Similar results were observed in return on equity (ROE), although the average of this variable is statistically equal to zero. It is not surprising that the average return on equity is greater than that of return on assets, but the standard deviation of return on equity (ROE) is greater than that of return on assets (ROA), reflecting greater dispersion in the results. The average annual rate of change in gross domestic product (GDP) at market prices, weighted by the number of companies in each country on the Iberian Peninsula, was 5.44%. The correlation coefficients of the variables are low, less than 0.8, thus not showing a problem of multiliniarity (Cohen, 1988). Sogorb-Mira (2005) advocate the exclusion of variables that are strongly correlated with each other to eliminate biases in regression results. This fact does not apply to the variables under analysis, all of which can be included in the models. The low correlation coefficients between the variables suggest that they present behaviours that are predominantly independent of each other, with only a few specific and weak relationships. However, there are some coefficients that, despite being low, stand out for being relatively higher, they are: FS/ROE, INVI/SIZE, INVI/GDP, INVI/SIZE and ROA/SIZE. The ROE/SIZE coefficient is negative, but of reduced magnitude, indicating that the size of the company has a small, but negative effect on the profitability of equity.

Empirical Findings

This section analyses the relationship between investment in innovation and financial sustainability in companies in the Iberian Peninsula in the years 2011 to 2020. The table with the model estimation results, in accordance with the methodology defined in section three, presents: (1) the estimates of the regression coefficients of the two proposed models, (2) the values in parentheses correspond to the p-value to evaluate the statistical significance of each coefficient, (3) the coefficients of determination (R^2) and the adjusted coefficients of determination (R^2a) and (4) the p-value associated with the F statistic to

assess the overall significance of the regression. Statistically significant coefficients, at a statistical significance level of 5%, are marked in bold. Statistical tests were carried out on the estimated models to detect the existence of heteroscedasticity and autocorrelation of residuals. In the White test (Breusch-Pagan) for a statistical significance level of 5%, the null hypothesis of the existence of homoscedasticity is not rejected. The Breush-Godfrey Serial Correlation LM test concludes, at a statistical significance level of 5%, that there is no autocorrelation. Table 2 presents the results of the regressions of equations (1) and (2), with panel data, for companies in the Iberian Peninsula from 2010 to 2022. In both equations, the Hausman statistical test was performed, and the models were estimated by the least squares' method with fixed effects.

Table 2. Model Estimation Results

Explanatory Variables	$Y_{i,t}=\beta_0+\beta_1X1_{i,t}+\beta_2X2_{i,t-1}+\beta_3X3_{i,t-2}+\beta_4ROA_{i,t-1}+\beta_5ROE_{i,t-1}+\beta_6SIZE_{i,t-1}+\beta_7GDP_{t-1}+\varepsilon_{i,t}$	
	Equation (1)	Equation (2)
Constant	**29.13** (0.00)	12.79 (0,07)
$FS_{i,t}$	0.52 (0.82)	
$FS_{i,t-1}$	**0.58** (0,04)	
$FS_{i,t-2}$	**0.66** (0,01)	
$INVI_{i,t}$		**-0.01** (0.05)
$INVI_{i,t-1}$		**-0.01** (0.04)
$INVI_{i,t-2}$		**0,01** (0.05)
$ROA_{i,t-1}$	-9.99 (0.23)	**0.23** (0.05)
$ROE_{i,t-1}$	3.76 (0.98)	**1.51** (0.01)
$SIZE_{i,t-1}$	9.84 (0.09)	0.92 (0.09)
GDP_{t-1}	**1.00** (0.00)	**0.75** (0.00)
R^2	0.25	0.59
R^2a	0.25	0.56
P-value (F)	0.00	0.00

The Table shows the estimates of the regression coefficients and below, in parentheses, the associated p-values. At the end of the table are the coefficients of determination (R^2), the adjusted coefficients of determination (R^2a) and the p-value associated with the F statistic of the global significance of the regression (P-value (F). The sample for estimating the models includes all companies included in the PSI and IBEX-35, in total 51 companies in the period from 2011 to 2022, thus totalling 612 annual observations. The two estimated equations, equations (1) to (2), have as variables: $INVI_{i,t}$, $INVI_{i,t-1}$ and $INVI_{i,t-2}$ is the investment in innovation of company i in year t, t-1 and t-2 respectively, measured by the quotient between research and development expenses and operating profit, $FS_{i,t}$, $FS_{i,t-1}$ and $FS_{i,t-2}$ is the financial sustainability of company i in year t, t-1 and t-2 respectively, the product of four indicators; sales margin (quotient between gross profit from sales and sales), asset turnover (quotient between revenue and the company's total assets), payout index (quotient between dividends and net profit) and capital multiplier (quotient between total assets and net equity), $ROA_{i,t}$ is the return on assets of company i in year t, the quotient between net profit and assets, $ROE_{i,t}$ is the return on net equity of company i in year t, from the quotient between net profit and net equity, $SIZE_{i,t-1}$ is the size of company i in year t, from the natural logarithm of assets and GDP_{t-1} from the average annual rate of change of domestic product gross at market prices of the two countries on the Iberian peninsula, weighted by the number of companies in the sample from each country.

Statistically significant coefficients at a statistical significance level of 5% are marked in bold.

In analysing the relationship between investment in innovation and financial sustainability, two models were estimated, represented by equations (1) and (2). Equation (1) presents investment in innovation as an explained variable and as explanatory variables financial sustainability in the period itself and lagged by one and two periods. While equation (2) presents financial sustainability as an explained variable and investment in innovation in the period itself and a lag of one and two periods as explanatory variables. Both equations also include the explanatory variables return on assets (ROA), return on equity (ROE), company size (SIZE) and gross domestic product (GDP), all in the period itself.

In the model represented by equation (1), Table 1, it appears that the financial sustainability variable, lagged by one and two periods, and the gross domestic product in the period itself, explain investment in innovation, as the beta coefficients associated with each of the variables are statistically significant at a 5% statistical significance level. The results indicate that the company's financial performance in the past positively influences the levels of investment in innovation. However, financial sustainability in the period itself is not statistically significant, suggesting that immediate financial impacts do not directly affect innovation decisions. The variables: return on assets and equity and company size are not statistically significant in explaining investment in innovation; these indicators are not direct determinants of investment in innovation.

In the individual significance test, the null hypothesis for the model constant is rejected, that is, at a statistical significance level of 5% the model constant is different from zero. It therefore indicates that there are other variables not included in the model that may be relevant to explain investment in innovation. In the global significance test, the null hypothesis is rejected, so that the set of explanatory variables proposed in the model are statistically significant in explaining the dependent variable. The adjusted coefficient of determination reveals that the explanatory variables proposed in the model explain approximately 24.6% of the variation in investment in innovation. In the model represented by equation (2) it appears that investment in innovation is statistically significant in explaining financial sustainability, but presents different effects over time. In the current period and one period behind, the impact is negative, suggesting that innovation efforts may represent immediate costs

that compromise financial sustainability. On the other hand, the effect becomes positive when two periods lag, indicating that the returns from innovation tend to materialize in the long term, contributing to the company's financial solidity.

The variables: return on assets, return on equity and gross domestic product, are statistically significant for financial sustainability, the same does not happen with the size of the company. The statistical significance of the ROE and ROA variables in explaining financial sustainability suggests that the company's operational efficiency plays an important role in determining financial stability, the same does not occur with the company's size. The model constant is statistically equal to zero for a statistical significance level of 5%, contrary to what is evident in equation (1), which indicates that the model is well specified, there are no other explanatory variables to explain financial sustainability in addition to those included in the model. In the global significance test, it is concluded that the set of explanatory variables proposed in the model are statistically significant in explaining the dependent variable. The adjusted coefficient of determination indicates that the explanatory variables proposed in the model explain approximately 56% of the variation in financial sustainability. In summary, the models capture important relationships, highlighting the influence of past financial sustainability on innovation investment and the differential temporal effects of innovation investment on financial sustainability. However, the analysis also suggests that other factors not included in the model may play a relevant role in explaining investment in innovation.

DISCUSSION AND CONCLUSION

The objective of this study is to analyse the relationship between investment in innovation/sustainability and financial sustainability in companies in the Iberian Peninsula, as well as the existence of other variables, accounting and macroeconomic, that explain both investment in innovation and financial sustainability. The sample is made up of 51 companies belonging to the Portuguese and Spanish stock market indexes, 16 and 35 companies respectively, from the PSI and IBEX-35, respectively, in the years 2011 to 2022. The methodology used is the estimation of linear regression models multiple, with panel data. The Hausman statistical test is performed on the estimated models and, according to the result of this test based on a significance level of 5%, the models are estimated with fixed effects. In analysing the explanatory capacity of the estimated models, the following are used: the global significance test of the model, the individual significance test and the adjusted coefficient of determination. There are several factors that highlight the importance of this study.

In addition to covering companies for which studies are unknown, they are companies that are part of a society that attaches little importance to cooperative social responsibility, as well as the seventeen sustainable development goals (17 SDGs) of the United Nations (UN). Comparatively, in other countries, there is greater awareness among managers, investors and financiers about the Sustainable Development Goals (SDGs). Understanding the relationship between investment in innovation and financial sustainability is crucial for various groups, such as managers, investors and researchers. Governments can also benefit from the results of this study, using them to develop policies that encourage sustainable growth in line with the 17 sustainable development goals. For investors and academics, the results obtained help in making decisions about the allocation of more efficient resources, identifying investment opportunities and supporting sustainable development.

A company's financial sustainability derives from its ability to generate positive results over time, which covers aspects such as profitability, liquidity, balance sheet strength and the ability to pay debts. On the other hand, investment in innovation refers to the allocation of resources in projects, assets or activities that have a positive impact in environmental, social and cooperative terms (Ziolo et al., 2019; Rizzelloi & Kabli, 2020; Trinks et al., 2020). Companies that demonstrate financial sustainability are increasingly aware of the need for investments in innovation. In the sample under analysis, it appears that the financial sustainability of a company, after one and two periods, is statistically significant in terms of investment in innovation and is, in fact, positive. However, there is no evidence that financial sustainability in the period itself has a direct impact on investment in innovation. Several authors find that when a company demonstrates financial sustainability over a given period, it tends to inspire confidence in investors and financiers. This trust can result in easier access to capital and more favourable financing conditions in subsequent periods (Eccles et al, 2014). The time lag between financial sustainability and investment is because managers, financiers and investors need a certain amount of time to assess the stability of financial sustainability (Ziolo et al., 2019; Rizzelloi & Kabli, 2020; Trinks et al, 2020; Eccles et al., 2014).

Investment in innovation is statistically significant in explaining financial sustainability. It has a negative impact on the period itself and the previous period and a positive impact when two periods lag. This fact was also confirmed by Naqbi et al (2020). These results can be explained by the fact that investment in innovation often requires significant financial resources, which can initially negatively influence the company's financial sustainability. However, over time, these investments tend to generate positive results, contributing to the improvement of the company's financial situation (Naqbi et al., 2020; Bowen et al., 2010; Chen et al., 2016). The variables return on assets, return on equity and company size do not seem to have explanatory capacity for investment in innovation. The only exception is the gross domestic product, which is shown to be statistically significant. But the ROA and ROE variables have explanatory capacity for financial sustainability, as they reflect the efficiency in the use of resources. The return on assets measures a company's ability to generate profits from its total assets, being essential for evaluating operational profitability, regardless of the capital structure. The return on equity indicates the profitability of equity, providing information about the creation of value for shareholders.

Companies with high and consistent return on assets and return ROE tend to demonstrate greater self-financing capacity and financial stability, which contributes to long-term sustainability. Thus, these variables are widely used to predict the financial health and future performance of companies. The company size variable did not demonstrate explanatory capacity for investment in innovation or financial sustainability, perhaps due to the existence of other factors such as the heterogeneity of business strategies and the influence of external variables. Furthermore, financial sustainability is more related to efficient resource management and the macroeconomic environment than to the size of the company. Thus, size

alone does not guarantee a greater propensity to invest in innovation or financial stability, highlighting the need to consider other explanatory variables (Naqbi et al., 2020; Plank & Doblinger, 2018). The gross domestic product (GDP) is a relevant indicator to explain companies' financial sustainability and investment in innovation. The gross domestic product is a relevant indicator that reflects the level of economic activity and macroeconomic conditions that directly affect revenue generation, access to credit, financial stability and consequently investment. The gross domestic product has a positive relationship with investment in innovation, as innovation decisions depend on factors external to the company that affect its internal decisions, such as business strategy, organizational culture and availability of specific resources for research and development (R&D).

Although the results obtained are relevant, it is important to highlight some limitations of this research. Firstly, the sample used only included companies listed in the Portuguese and Spanish market indices. As a result, there may be other factors not considered in this study that could influence the variables under analysis, such as legal, cultural or economic differences between countries, other than just those in the sample. Furthermore, although the work developed allows us to draw some conclusions, as mentioned previously, it also suggests hypotheses and questions that can be explored in future research. A possible direction for future studies would be to overcome the aforementioned limitation, including companies listed on stock exchanges in other countries in the sample, to assess whether the results are similar, or whether they change depending on the companies and their external environment (nationality and societal values), on social responsibility.

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EMPOWERING WOMEN IN RURAL MONTENEGRO: A PATHWAY TO SUSTAINABLE RURAL TOURISM DEVELOPMENT

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Abstract: The research posits that empowered women are crucial to rural tourism and sustainable rural development, as they embody strength and decisiveness in their engagement. Women are identified as the foundational element of rural tourism, entrepreneurship, and overall rural development. The study aims to reach and empower women in rural areas, highlighting the challenges they face and promoting positive outcomes for their communities. Two surveys were conducted: among women entrepreneurs in rural tourism (41) as well as among tourists, users of rural tourism (228). A factor analysis was performed, which separated 3 factors, as well as Structural Equation Modeling (SEM), which tested cause-effect relationships between them. The results of the first research among women entrepreneurs in rural tourism showed that women are drawn to rural tourism for sustainable income opportunities, economic diversification, and the chance to take on leadership roles and make decisions within their communities.The results of the second research reveals that guests who enjoy rural tourism in Montenegro highly value Unique Experiences, Authenticity, and Sustainability. These factors are interconnected, with strong relationships indicating that enhancing unique experiences can also promote authenticity and sustainability. By focusing on these key areas and leveraging the strong relationships between them, it can be concluded that rural tourism is a sustainable form of tourism, which strongly predisposes women to engage in rural tourism. It is a cause-and-effect relationship, because by engaging in tourism, women are empowered. A satisfied woman is the foundation of a healthy family, which is, in every sense, a pledge of a sustainable future.

Keywords: sustainability, women entrepreneurship, empowerment, rural development, rural tourism, Montenegro

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INTRODUCTION

The empowerment of women in rural tourism carries significant benefits, not just for the individuals involved but also for the broader community. According to Vujko et al. (2024a), women who operate small-scale bed-and-breakfast establishments often source their ingredients from local farmers, fostering a network of economic interdependence that strengthens community ties. Furthermore, the social empowerment of women through entrepreneurship enhances their roles within their communities, allowing them to become decision-makers and leaders (Zeng & Magazzino, 2024; Zhang et al., 2025). This shift fosters a culture of collaboration and resilience, where women support one another in their ventures. Importantly, female entrepreneurs are also more likely to prioritize sustainable tourism practices (Schianetz & Kavanagh, 2008; Addai et al., 2024), such as responsible resource management and conservation initiatives, as they often possess a deep-rooted connection to their environment (Bojović et al., 2024).

Despite the promising landscape of female entrepreneurship in rural tourism (Regmi et al., 2023), significant challenges persist that hinder women's full participation in this sector. Access to funding and financial resources remains a formidable barrier, as women often encounter difficulties in securing loans or investment due to a lack of collateral or financial literacy (Chen & Barcus, 2024). Societal and cultural barriers further exacerbate these challenges, with traditional gender roles and stereotypes discouraging women from pursuing entrepreneurial endeavors (Sutrisno et al., 2024).

In many rural areas, the expectation for women to prioritize family responsibilities over professional aspirations can limit their opportunities for growth and success (Sahrakorpi & Bandi, 2021). Additionally, the scarcity of training and support networks tailored to women in tourism poses a significant obstacle. Without mentorship or access to skill development programs, many aspiring female entrepreneurs may struggle to navigate the complexities of establishing and managing a business (De Groot et al., 2017). Addressing these challenges requires a multi-faceted approach that encompasses financial support, educational initiatives, and community engagement to foster an environment where women can thrive as entrepreneurs in rural tourism (Kitole & Genda, 2024).

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The empowerment of women in tourism entrepreneurship can yield significant benefits for sustainable tourism development (Strippoli et al., 2024; Rashwan et al., 2024). Women-led businesses often contribute to local economies by creating jobs and generating income that is reinvested into communities. Jiang et al. (2024) indicates that women are more likely to support local suppliers and preserve cultural heritage, which enhances community engagement and promotes cultural preservation. According to Ling et al. (2013) women-owned eco-tourism ventures in Montenegro have successfully integrated traditional practices with sustainable tourism, thereby fostering a deeper connection between visitors and local communities. Moreover, women entrepreneurs are often champions of environmental stewardship, implementing sustainable practices that minimize the ecological footprint of tourism activities (Costantini et al., 2021; Marinello et al., 2023; Li et al., 2024). This commitment is vital in a country like Montenegro, which is known for its stunning natural landscapes and biodiversity (Pécot et al., 2024). As travelers increasingly seek authentic experiences away from the hustle and bustle of city life, rural tourism provides a pathway for individuals to explore the serene beauty of nature, engage with local traditions, and participate in enriching activities (Martínez et al., 2019). This growing trend not only benefits travelers but also supports local communities, allowing them to showcase their heritage and sustain their way of life. According to Chin et al. (2025) rural tourism is not merely a form of escapism; it is an opportunity to appreciate and celebrate the unique characteristics that define rural living (Vujko et al., 2024b).

The importance of unique experiences in rural tourism cannot be overstated, as they serve as a primary motivator for travelers seeking to connect with a destination on a deeper level (Firstianto et al., 2024). Unique experiences are defined as activities or encounters that provide tourists with novel and memorable interactions, often characterized by their local flavor and distinctiveness (Qeidari et al., 2024). In Montenegro, tourists might seek out experiences such as participating in traditional grape harvesting, learning to prepare authentic Montenegrin dishes, or exploring hidden natural wonders like the pristine beaches of the Bay of Kotor (Nikčević, 2019).

According to a study conducted by Galli et al. (2018), travelers who engage in such unique experiences report significantly higher levels of satisfaction compared to those who partake in standard tourism offerings. The impact of these unique experiences extends beyond immediate satisfaction; they also foster a sense of connection to the destination, encouraging repeat visits and positive word-of-mouth recommendations. This emphasis on unique experiences aligns with the growing trend of experiential travel, whereby tourists increasingly prioritize immersive activities over passive sightseeing, thereby cementing the importance of this factor in the rural tourism landscape of Montenegro. Authenticity plays a crucial role in shaping the appeal of rural tourism, as it encapsulates the genuine aspects of a destination that resonate with visitors seeking meaningful connections (Hu & Wang, 2025). In the context of rural tourism, authenticity refers to the perceived truthfulness of experiences and interactions, often linked to local culture, traditions, and practices (Yanan, 2024). In Montenegro, authenticity manifests in various forms, such as the preservation of traditional handicrafts, folk music, and dance, which are integral to the local identity. Tourists are drawn to authentic experiences that allow them to engage with the local community, such as staying in family-run guesthouses or participating in cultural festivals. These authentic interactions not only enhance the visitor experience but also contribute to the preservation of local heritage (Zhao et al., 2024). According to Zhao et al. (2024) tourists who perceive their experiences as authentic are more likely to develop an emotional connection to the destination, leading to increased satisfaction and a desire to return. Thus, authenticity serves as a compelling magnet for rural tourism in Montenegro, creating a symbiotic relationship between tourists and the local culture that enriches both parties.

Sustainability is increasingly recognized as a foundational principle in the development of rural tourism (Gao & Wu, 2017) encompassing practices that minimize environmental impact while promoting social and economic benefits for local communities (Han et al., 2024). Defined as the ability to maintain ecological balance while meeting the needs of present and future generations, sustainability is particularly relevant in the context of Montenegro, where natural resources are a significant draw for tourists. Sustainable tourism practices in Montenegro include initiatives such as promoting organic farming, supporting eco-friendly accommodations, and implementing waste reduction programs (Morić, 2013). These practices not only protect the environment but also enhance the overall tourist experience by allowing visitors to engage with the nature of the region responsibly. The interconnections between unique experiences, authenticity, and sustainability create a holistic approach to rural tourism development (Cheng et al., 2025). According to Cheng et al. (2025) offering authentic experiences that showcase sustainable practices—such as guided eco-tours that educate tourists about local ecosystems—can enhance both the sense of authenticity and the sustainability of the tourism sector. By fostering these interrelationships, Montenegro can cultivate a rural tourism environment that resonates with the values of modern travelers, ultimately leading to a more sustainable and enriching experience for all.

The research started from the initial hypothesis H that an empowered woman represents a strong woman who gladly decides to engage in rural tourism, and therefore such a woman is a decisive factor in sustainable rural development. Women are the "backbone" of all rural tourism, entrepreneurship and rural development. The point is to reach women in rural areas and then have a positive effect on them, so studies like this aim to empower women and point out the main problems faced by women in villages. The main aim of the research was to use examples of good practice and experiences of women who are already involved in rural tourism, to be an indication to all women in the villages that rural tourism and their role within the activity is a sustainable form of business and that it is something that they should do to an even greater extent. In order to show that the future of rural tourism "lies" in women's hands because they are the bearers of rural tourism, it was necessary to conduct research on the motives and attitudes of tourists about rural tourism. This required the setting of a sub-hypothesis h1: the motives that indicate that rural tuism is a sustainable form of tourism represent a push-up effect for women and a way of empowering even more women to decide to engage in

rural tourism. Within their families or independently. Three fundamental factors that have been identified as pivotal for guest satisfaction in rural tourism are unique experiences, authenticity, and sustainability. These factors are not only interrelated but also mutually reinforcing, suggesting that enhancing one can lead to improvements in the others.

LITERATURE REWIEW

Women play an essential role in shaping rural tourism and entrepreneurship, acting as vital catalysts for sustainable development in their communities (Vujko et al., 2024a; Vujko et al., 2024b). By engaging in rural tourism, women can significantly contribute to local economic growth, allowing younger generations to remain in their villages and thus promoting the sustainability of these areas (Gulnur & Kamshat, 2025). This empowerment is not only economic but also social, as women often take the initiative to form associations that enhance their influence and foster better relationships within their communities (Allan, 2025). Through activities such as producing and selling local food, beverages, and souvenirs, women identify themselves as key players in the rural tourism industry, often referred to as "rural tourism product producers" or "providers" (Xu et al., 2025). Additionally, the fight for women's rights translates into improved living and working conditions, leading to a more equitable distribution of benefits within the tourism sector (Chin et al., 2025). However, traditional gender roles can impose challenges by limiting women's participation and creating conflicts between career aspirations and family responsibilities (Baird, 2024). Despite these hurdles, the evidence suggests that women's involvement in rural tourism not only enhances their own livelihoods but also catalyzes meaningful change, ultimately benefiting their families and communities at large (Krause, 2024). The multidimensional scale used in research highlights how women's empowerment encompasses psychological, social, and political dimensions, reinforcing the notion that empowering women is vital for the sustainable transformation of rural areas (Gu et al., 2024).

In recent years, Montenegro has emerged as a destination that intertwines natural beauty with rich cultural heritage, drawing attention to the potential of rural tourism (Despotović, 2018). However, within this burgeoning sector lies a critical aspect that warrants exploration: female entrepreneurship The landscape of female entrepreneurship in rural tourism in Montenegro is characterized by a blend of historical influences and contemporary trends that shape women's involvement in the industry (Melović & Ćirović, 2023). Rural tourism, which encompasses various activities such as agritourism, eco-tourism, and cultural tourism, has gained traction due to Montenegro's landscapes and diverse cultural offerings. Traditionally, women have played a vital yet often overlooked role in the tourism sector, primarily as providers of hospitality and guardians of local traditions (Stanovčić et al., 2018).

With the advent of rural tourism, there has been a noticeable shift, as women are increasingly stepping into entrepreneurial roles, establishing guesthouses, artisanal shops, and eco-friendly tour operations. Current trends reveal a growing number of women-led initiatives, supported by government and non-governmental organizations that recognize the importance of gender equality in economic development. For instance, programs aimed at promoting female entrepreneurship, such as training workshops and funding opportunities, have begun to emerge, reflecting a positive shift towards inclusivity and empowerment in the tourism sector.

Women constitute a vital yet often overlooked segment of Montenegro's tourism workforce (Ljaljevic et al., 2023). While they represent a significant percentage of employees in hospitality and service roles, their presence diminishes in leadership and entrepreneurial positions. Barriers to women's full participation in tourism entrepreneurship include cultural norms that discourage women from pursuing business opportunities, limited access to financial resources, and insufficient representation in decision-making processes. According to Ljaljevic et al. (2023) to empower women in tourism entrepreneurship, several strategic initiatives can be implemented. First and foremost, tailored education and training programs are crucial. These programs should focus on business management, marketing, and digital skills, equipping women with the necessary tools to thrive in a competitive environment. For example, programs like the "Women in Business" initiative in Montenegro have shown promise in enhancing women's entrepreneurial skills. Additionally, facilitating access to financial resources, such as microloans and grants specifically designed for women entrepreneurs, can alleviate financial barriers. Institutions such as the European Bank for Reconstruction and Development (EBRD) have introduced initiatives aimed at improving women's access to financing. Furthermore, creating networking opportunities and mentorship programs can foster valuable connections that guide women entrepreneurs through the complexities of starting and managing a business. Such initiatives not only empower individual women but also cultivate a supportive community that encourages collaboration and innovation.

MATERIALS AND METHODS

The research was conducted in two separate processes. First, women who are engaged in rural tourism as part of their family businesses were interviewed. The authors visited family businesses engaged in rural tourism on several occasions during the summer of 2024. These are organic farms, wineries, oil mills and katuns located in the towns of: Plužinne, Kolašin, Berane, Žabljak, Šavnik, Plav, Mojkovac and Nikšić in Montenegro. Katuns represent one of Montenegro's oldest traditions and are arguably its most significant cultural heritage. These temporary settlements, situated in the mountains, serve as summer retreats for cattle herders and provide grazing grounds for their livestock. Typically located in breathtakingly beautiful areas, the authentic Katun huts harmoniously blend into the surrounding landscape. Here, one will not encounter the conveniences of modern life; the roads are unpaved, and there is a lack of electricity, water supply, sewage systems, and internet access. Such rural environments cater to those seeking to revert to a century-old lifestyle, allowing them to step into a different era and experience the existence of nomadic herders who enjoy simple yet extraordinarily delicious meals. The research started from the initial hypothesis H that an empowered woman

represents a strong woman who gladly decides to engage in rural tourism, and therefore such a woman is a decisive factor in sustainable rural development. Also, a sub-hypothesis h1 was put forward: the motives that indicate that rural tuism is a sustainable form of tourism represent a push-up effect for women and a way of empowering even more women to decide to engage in rural tourism. Within their families or independently. In order to test the initial hypothesis H and sub-hypothesis h1, it was necessary to provide answers to two main questions:

- **Why do women engage in rural tourism?** and
- **Why do tourists decide to spend their free time in rural destinations and enjoy rural tourism?**

Women, who are engaged in rural tourism with their families, were asked a total of 12 questions to which they had to answer on a five-point Likert scale. They gave their opinion on rural tourism, that is, female entrepreneurship and women's empowerment (Vujko et al., 2019). We wanted to find an answer to the question: **Why do women engage in rural tourism?** Later, the results were interpreted based on their responses, grouped by similarity. Interpretivism and constructivism emerge as the predominant epistemological approaches that we have also used in our research. Interpretivism focuses on the subjective experiences of individuals, using qualitative methods to uncover deeper meanings and insights. Constructivism posits that knowledge is co-created through social interactions and is contextually bound, emphasizing the importance of understanding the specific circumstances that shape individuals' experiences. These epistemological stances shape not only the formulation of research questions but also the methodologies employed, thereby influencing the direction and results of research in significant ways.

The epistemological stance has influenced the understanding of women's entrepreneurship, particularly in the context of rural tourism. The interpretive stance has prioritized the subjective experiences and stories of women entrepreneurs, allowing for a more nuanced understanding of the challenges they face, such as cultural barriers and access to resources. Through qualitative interviews and narrative analysis, the emotional and psychological dimensions of entrepreneurship were uncovered, thereby illuminating the motivations and aspirations that drive these women. Constructivism added another layer of depth by emphasizing the co-creation of knowledge; it encouraged the authors to engage with women entrepreneurs in a collaborative manner, recognizing that their insights are shaped by their unique socio-cultural context. This stance led to context-specific insights that challenge conventional narratives and highlight the heterogeneity of women's experiences in rural tourism.

The second part of the research referred to the guests of their rural enterprises. When registering and reserving their place in these facilities, guests left their email addresses to which, also during the summer of 2024, they were sent a group of 24 variables to which they were supposed to give answers on a five-point Likert scale. We wanted to find answers to the following questions: **Why do tourists decide to spend their free time in rural destinations and enjoy rural tourism?**

Out of the 300 e-mails sent, 228 were sent to the author's address and processed by factor analysis. Certain responses clustered around 3 specific factors:

- **Factor 1. Authenticity** - A1. People like to enjoy slow food and slow tourism that are opposite to the busy life; A2. Rural areas typically offer beautiful landscapes, fresh air, and natural surroundings that are often lacking in urban settings; A3. Local food and drinks offer a taste of the area's culinary heritage, while handicrafts showcase traditional skills and artistry and A4. Rural tourism authenticity enhances the overall travel experience.

- **Factor 2**. **Unique Experiences:** UE1. The chance to taste homemade dishes or buy handcrafted items creates memorable experiences that resonate with travelers long after their visit; UE2. The reduced noise levels and less crowded spaces allow individuals to relax and unwind, making it an attractive option for those seeking respite from daily stressors; UE3. Many villages have rich traditions and unique cultural practices that can be appealing to tourists and UE4. Learning about the stories behind the food and crafts fosters an appreciation for the culture and history of the area.

- **Factor 3**. **Sustainability:** S1. Many rural tourism initiatives focus on sustainable practices that preserve local resources and traditions; S2. Rural tourism often includes various outdoor recreational options such as farming experiences, fishing, cycling, or horseback riding and S3. Outdoor activities not only promote physical health but also enhance enjoyment through engagement with the environment.

Following the execution of factor analyses and the extraction of three characteristic factors, we proceeded to Structural Equation Modeling (SEM). This multivariate technique is specifically designed to assess hypothesized cause-and-effect relationships among the latent constructs within a conceptual model. In SEM, path coefficients serve as indicators of the strength of the relationships present in the dependent data. Additionally, this method effectively addresses issues related to multicollinearity, which occurs due to high correlations among predictor variables. A notable advantage of SEM over multiple regression and factor analysis is that all components of SEM modeling are guided by theoretical frameworks; thus, the construction and adjustments of models are predominantly informed by theoretical insights. A frequent misuse of SEM arises when data are merely fitted to an appropriate SEM, leading to the development of theory that is solely based on the outcomes of that analysis.

RESULTS AND DISCUSSION

Looking at Table 1, it can be concluded that 41 women participated in the first survey. They ranked the responses to the questions on a five-point Likert scale, and it is interesting that almost all questions were answered in intervals from 1 (Totally agree) to 3 (No opinion). And again, the mean values range from 1.20 to a maximum of 1.34, which means that the largest number of responses went in the direction of complete agreement with the statements.

Table 1. Descriptive Statistics (Source: Authors, 2025)

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
v1	41	1	2	49	1.20	.401
v2	41	1	3	50	1.22	.475
v3	41	1	3	55	1.34	.617
v4	41	1	2	49	1.20	.401
v5	41	1	2	50	1.22	.419
v6	41	1	2	52	1.27	.449
v7	41	1	3	51	1.24	.538
v8	41	1	2	49	1.20	.401
v9	41	1	2	49	1.20	.401
v10	41	1	2	49	1.20	.401
v11	41	1	2	53	1.29	.461
v12	41	1	2	50	1.22	.419
Valid N	41					

Women engage in rural tourism in Montenegro for various reasons, primarily driven by economic motivations such as financial independence and empowerment. They also participate to preserve cultural heritage, build community networks, and create sustainable income opportunities. Additionally, rural tourism allows women to start small businesses, diversify their income sources, and take on leadership roles in decision-making processes within their communities.

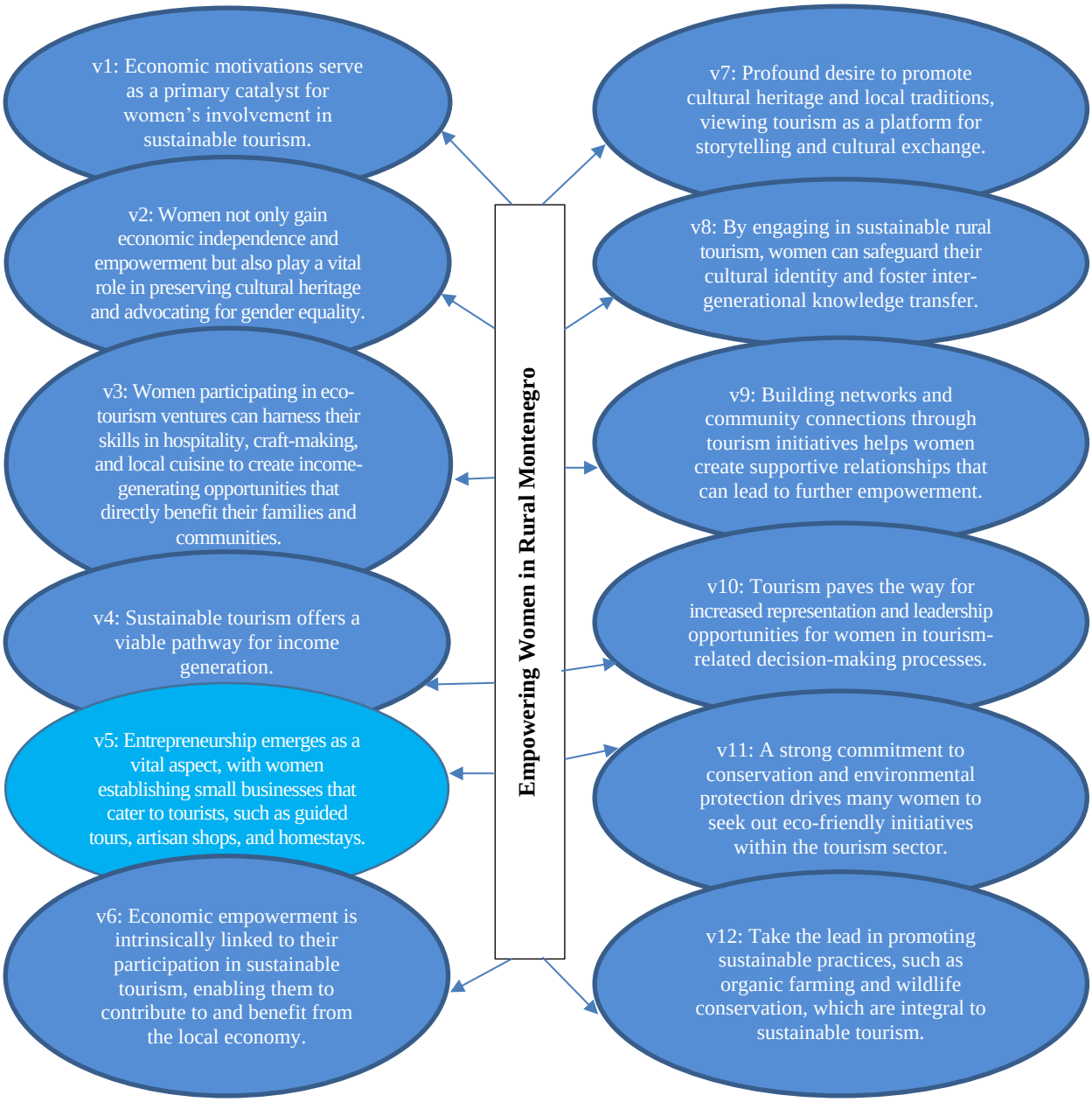


Figure 1. The reasons why women engage in rural tourism in Montenegro (Source: Authors, 2025)

Based on the information extracted from the Figure 1. the reasons why women engage in rural tourism in Montenegro include: **Economic Motivations and Financial Independence**: Women seek financial independence through tourism, which offers a viable source of income. This economic empowerment allows them to challenge and transform traditional gender roles, advocating for gender equality; **Cultural Preservation and Identity**: Engaging in tourism activities helps women preserve and celebrate their cultural heritage. By maintaining local traditions, crafts, and cultural practices, they ensure these elements survive for future generations. This engagement also fosters intercultural understanding and showcases their cultural identity. **Community and Networking**: Tourism creates opportunities for women to build networks and community support. By connecting with other entrepreneurs, they can share knowledge and collaborate, furthering their empowerment and fostering a sense of community and belonging;

Sustainable Income and Economic Diversification: Sustainable tourism offers a pathway for consistent income generation. Women participating in tourism-related activities, such as crafts, cuisine, and hospitality, create direct economic benefits for their families and communities. This involvement also helps diversify income sources, reducing dependency on traditional forms of income; **Entrepreneurial Opportunities**: The tourism sector provides women with opportunities to start small-scale businesses, such as guesthouses, craft shops, and local tours. These entrepreneurial ventures leverage their skills and knowledge, contributing to their economic empowerment and **Leadership Roles and Decision-Making**: Tourism paves the way for women to take on leadership roles in tourism-related decision-making processes. By participating in village tourism councils and other decision-making bodies, women can integrate their needs and aspirations into local tourism policies and practices. All this gave an answer to the first question Why do women engage in rural tourism? and it confirmed the initial hypothesis of work H that an empowered woman represents a strong woman who gladly decides to engage in rural tourism, and therefore such a woman is a decisive factor of sustainable rural development.The initial factor analysis (Table 2) produced a model that classifies the variables into three distinct factors, which together represent 78.88% of the variance. Examination of Table 2 reveals that two factors possess an Eigenvalue greater than 1, indicating that the extracted factors are both adequate and sufficient.

Table 2. Total Variance Explained (Source: Authors, 2025)

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.955	35.956	35.956	3.398	30.888	30.888	2.812	25.567	25.567
2	3.343	30.387	66.343	3.046	27.691	58.579	2.627	23.880	49.447
3	1.379	12.537	78.880	1.392	12.653	71.232	2.396	21.785	71.232
4	.675	6.134	85.014						
5	.462	4.198	89.212						
6	.375	3.414	92.626						
7	.286	2.604	95.230						
8	.220	1.997	97.227						
9	.131	1.193	98.420						
10	.105	.952	99.372						
11	.069	.628	100.000						

Table 3. Factor Matrix (Source: Authors, 2025)

	Factors		
	Unique Experiences	Authenticity	Sustainability
A1	.683	.100	.343
A2	.898	.338	-.052
A3	.811	.356	-.287
A4	.623	.210	.512
UE1	-.403	.706	.278
S1	-.472	.470	.506
S2	-.006	.553	.521
S3	.150	.575	.443
UE2	-.015	.710	-.098
UE3	-.550	.663	-.247
UE4	-.607	.671	-.235

According to Table 3. Guests who enjoy rural tourism in Montenegro are primarily motivated by the desire for **Unique Experiences, Authenticity, and Sustainability**. These factors are interconnected, with strong relationships indicating that enhancing unique experiences can also promote authenticity and sustainability. By focusing on these key elements, tourism providers can improve guest satisfaction and attract more visitors to the region. The latent variables (F1, F2, F3) represent the main motives of guests: Unique Experiences, Authenticity, and Sustainability (Figure 2). Each latent variable is measured by multiple observed indicators (UE1-UE4, A1-A4, S1-S3). The path coefficients between latent variables and their indicators show the strength of the relationship. Higher values indicate stronger relationships. The relationships between the latent variables (F1, F2, F3) indicate how these motives are related to each other. For example, F1 (Unique Experiences) has a strong positive relationship with F3 (Sustainability) with a coefficient of 1.58. According to Figure 1. there is a significant positive relationship between Unique Experiences and Sustainability, suggesting that guests who value unique experiences also highly value sustainability. Authenticity is moderately related to both Unique Experiences and Sustainability.

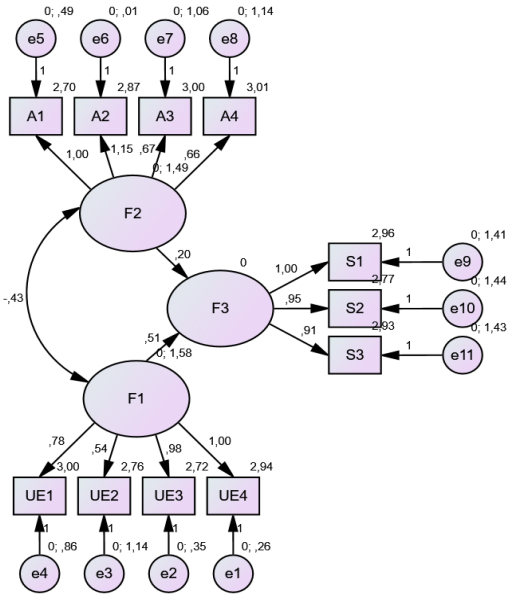


Figure 2. Structural Equation Modeling (SEM) (Source: Prepared by the authors, 2025)

Table 4. Standardized Regression Weights: (Group number 1 – Default model) (Source: Authors, 2025)

			Estimate
F3	<---	F2	.384
F3	<---	F1	1.037
A1	<---	F1	.926
A2	<---	F1	.901
A3	<---	F1	.538
A4	<---	F1	.724
UE1	<---	F2	.866
S1	<---	F2	.997
S2	<---	F2	.622
S3	<---	F2	.602
UE2	<---	F3	.465
UE3	<---	F3	.441
UE4	<---	F3	.430

These assumptions provide a comprehensive understanding of the motives and attitudes of guests who stayed and enjoyed rural tourism in Montenegro based on the provided path diagram.

- Unique Experiences (F1) is strongly associated with its indicators, especially UE4 (0.26). **UE1 (0.86), UE2 (1.14), UE3 (0.35), UE4 (0.86):** These coefficients indicate that UE4 is the most strongly associated with Unique Experiences, followed by UE2, UE1, and UE3. Error terms (e1 to e4) are relatively small, suggesting that F1 explains a significant portion of the variance in these indicators.
- Authenticity (F2) has a strong relationship with A3 (0.67) and A2 (1.15). **A1 (1.00), A2 (1.15), A3 (0.67), A4 (0.66):** A3 has the strongest association with Authenticity, followed by A2, A4, and A1. Error terms (e5 to e8) indicate that F2 explains a substantial portion of the variance in A2, A3, and A4, but less so for A1.
- Sustainability (F3) is perfectly measured by S1 (1.00) and also strongly by S2 (0.95) and S3 (0.91). **S1 (1.00), S2 (0.95), S3 (0.91):** S1 is perfectly associated with Sustainability, indicating it is a key indicator. Error terms (e9 to e11) are small, suggesting F3 explains most of the variance in these indicators. Looking at Table 4, it can be concluded that the positive impact of women entrepreneurs on local economies, community engagement, and environmental sustainability underscores the critical need for gender equality in tourism development. As Montenegro progresses towards a more inclusive tourism landscape, the empowerment of women will not only enrich the sector but also contribute to the overall well-being of society, paving the way for a more sustainable future. Therefore, the results obtained from the second research gave an answer to the second question: Why do tourists decide to spend their free time in rural destinations and enjoy rural tourism? and confirmed sub-hypothesis h1: that the motives that indicate that rural tuism is a sustainable form of tourism represent a push-up effect for women and a way of empowering even more women to decide to engage in rural tourism. Within their families or independently.

CONCLUSION

The empowerment of women in rural tourism is crucial for both individual and community development, as it leads to economic growth through job creation and income generation while fostering social leadership among women. Despite the potential benefits, women face significant challenges such as limited access to funding, societal expectations, and a lack of tailored support networks, which hinder their participation in entrepreneurship. Addressing these barriers through education, financial resources, and community engagement is essential for promoting sustainable tourism practices and enhancing the overall tourism experience in rural areas like Montenegro. The research conducted in Montenegro explored the role of women in rural tourism, focusing on their motivations and the impact of their engagement on sustainable rural development. Interviews with 41 women involved in family-run rural tourism businesses revealed that economic independence, cultural preservation, and community networking were key reasons for their participation. Additionally, a survey of 228 tourists identified authenticity, unique experiences, and sustainability as primary motivators for choosing rural destinations, highlighting the interconnectedness of these factors and the potential for women's empowerment through tourism.

Rural tourism in Montenegro is profoundly shaped by the intertwined factors of unique experiences, authenticity, and sustainability. Each of these elements plays a crucial role in attracting and satisfying visitors, while also fostering a deeper connection between tourists and the local culture. Unique experiences offer travelers the opportunity to immerse themselves in the Montenegrin way of life, while authenticity enhances the emotional resonance of these encounters. Simultaneously, sustainable practices ensure that the natural and cultural resources that attract tourists are preserved for future generations. As Montenegro continues to develop its rural tourism sector, a focus on these interconnected factors will not only enhance visitor satisfaction but also contribute to the long-term viability and resilience of its tourism industry. By embracing the principles of unique experiences, authenticity, and sustainability, Montenegro can establish itself as a premier destination for travelers seeking meaningful and responsible tourism experiences.

Female entrepreneurship and rural tourism in Montenegro presents a compelling narrative of potential and resilience. As women increasingly engage in this sector, they are not only contributing to economic growth but also reshaping societal norms and promoting sustainable practices. However, to fully realize this potential, it is imperative that stakeholders address the challenges faced by female entrepreneurs, creating a more inclusive and supportive framework for their success. By empowering women in rural tourism, Montenegro can harness the transformative power of female leadership, paving the way for a brighter, more equitable future in the tourism industry. As Montenegro continues to develop its rural tourism sector, the role of women must be recognized and amplified, ensuring that their contributions are valued and their voices heard.

The biggest limitations of the study are found in the following items: 1. Small sample size: If the study included a limited number of participants, it may not accurately represent the wider population of women in rural Montenegro. This can lead to skewed results that do not reflect the experiences or needs of all women in similar contexts. 2. Potential bias in data collection: The methods used to collect data (eg surveys, interviews) can lead to bias if not carefully designed. For example, if only certain groups of women were interviewed (eg those already engaged in tourism), the perspectives of those who are not engaged or less empowered could be overlooked. 3. Lack of longitudinal analysis: If the study was cross-sectional and did not track changes over time, it may miss important trends or changes in women's empowerment and their impact on tourism development. Longitudinal studies provide insight into how relationships develop and can highlight long-term effects. 4. Limited generalizability to other regions: Findings specific to rural mountains Montenegro may not be applicable to other regions with different socio-economic conditions, cultural backgrounds or governance structures. This limits the ability to draw broader conclusions about women's empowerment and sustainable tourism elsewhere. 5. Insufficient consideration of cultural factors: The study may not fully take into account local cultural norms and values that affect the roles and opportunities of women in tourism development. Understanding these cultural dimensions is key to designing effective empowerment strategies that resonate with local communities. Acknowledging these limitations, future research can aim to address them and provide stronger insight into women's empowerment for sustainable rural tourism development.

Practical Recommendations: Enhance Unique Experiences: Focus on improving aspects related to UE4, as it has the strongest association with Unique Experiences.

- Develop unique and memorable activities that align with the guests' desire for unique experiences. One of the most effective ways to enhance unique experiences in rural tourism is through activities that showcase local culture. Traditional craft workshops, such as pottery and weaving, allow guests to gain hands-on experience while learning about the heritage and skills passed down through generations. Culinary experiences also play a crucial role in this cultural immersion. Farm-to-table dinners that feature locally sourced ingredients not only tantalize the taste buds but also educate guests about regional produce and sustainable practices. Imagine savoring a dish made with heirloom tomatoes and freshly harvested herbs while listening to the stories of the farmers who cultivated them. Furthermore, cultural festivals and local events, such as harvest celebrations or seasonal fairs, provide an authentic glimpse into the community's traditions, allowing visitors to engage with residents, partake in local customs, and create lasting memories. In addition to cultural experiences, immersive nature-based activities are essential for enhancing rural tourism. Guided nature walks and eco-tours offer guests a chance to explore the diverse flora and fauna of the region while learning about the local ecosystem. These activities can be enriched by knowledgeable guides who share insights on indigenous plant species, wildlife habits, and conservation efforts, fostering a deeper appreciation for the natural world. For the more adventurous traveler, activities such as hiking, kayaking, and birdwatching provide exhilarating ways to connect with the landscape. Additionally, stargazing events in rural areas, characterized by minimal light pollution, can offer guests a breathtaking view of the night sky, transforming a simple evening into an awe-inspiring experience. Participants can learn about constellations, planets, and even the myths surrounding them, deepening their connection to the universe and the rural environment. Finally, personalized guest interactions are pivotal in enhancing the overall experience in rural tourism. Tailored itineraries that reflect individual guest interests and preferences allow for a more meaningful exploration of the area. Moreover, opportunities for guests to interact with local families and communities, such as sharing a meal or participating in traditional activities, foster authentic connections and provide deeper insights into rural life. These interactions offer travelers a chance to learn firsthand about local customs, stories, and daily routines, turning their stay into a rich cultural exchange. Finally, implementing feedback mechanisms can greatly enhance the guest experience by allowing tourism operators to adapt their offerings based on visitor insights. By actively seeking guest opinions and suggestions, rural tourism providers can continually improve their services and ensure they meet evolving expectations, ultimately creating a cycle of enhancement that benefits both visitors and the local community.

Promote Authenticity: Highlight authentic experiences, particularly those related to A3 and A2, as they have strong associations with Authenticity.

- Ensure that marketing materials emphasize the authentic aspects of the rural tourism experience. To effectively market authentic rural tourism experiences, it is essential to employ strategic approaches that resonate with potential visitors. One powerful strategy is storytelling, which can convey genuine narratives that evoke emotional connections to the destination. By sharing the stories of local residents, their traditions, and their way of life, marketing materials can create a vivid picture of what visitors can expect. ngaging local communities in promotional efforts is crucial for authenticity; when locals participate in crafting marketing content, it ensures that the representation of their culture is both respectful and accurate. Additionally, leveraging social media platforms allows for the showcasing of real visitor experiences and testimonials, providing potential tourists with relatable and genuine insights. Sharing user-generated content that highlights authentic interactions, such as visitors enjoying a meal with a local family or participating in a traditional craft workshop, can significantly enhance the appeal of rural tourism experiences. By employing these strategies, marketers can create a compelling narrative that emphasizes the authenticity of rural tourism, drawing in curious travelers eager for genuine engagement.

Emphasize Sustainability: Given the strong relationship between Sustainability and both Unique Experiences and Authenticity, integrate sustainable practices into all aspects of the tourism experience.

- Promote sustainability initiatives and educate guests on the importance of sustainable tourism. The emphasis on sustainability in rural tourism is not only a response to the growing demand for responsible travel but also a critical strategy for the preservation of local cultures and ecosystems. By understanding the significance of sustainability, implementing effective strategies, and learning from successful case studies, rural communities can create a tourism model that benefits both visitors and residents alike. Integrated Marketing Strategy: Develop a marketing strategy that highlights the interconnectedness of Unique Experiences, Authenticity, and Sustainability.
- Use the strong inter-factor relationships to create a cohesive narrative that appeals to guests' values. The interconnectedness of unique experiences, authenticity, and sustainability forms a powerful framework for developing an effective marketing strategy in rural tourism. By emphasizing unique experiences that highlight local culture and traditions, tourism operators can create memorable engagements that resonate with travelers. Authenticity enhances these experiences by fostering genuine interactions between tourists and local communities, thereby enriching the overall travel experience. Finally, sustainability ensures that tourism practices contribute positively to the economic, social, and environmental fabric of rural areas. As rural tourism continues to evolve, embracing these interrelated elements will be crucial for creating a sustainable future that benefits both visitors and the communities they visit, ultimately transforming rural destinations into thriving hubs of cultural exchange and ecological stewardship.

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THE ROLE OF SOCIAL MEDIA PLATFORMS IN PROMOTING LOCAL TOURISM IN JORDAN

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Abstract: Tourism is an important economic sector that contributes to sustainable development by increasing income and creating jobs. In Jordan, tourism plays a vital role due to its diverse historical and natural attractions. Promoting local tourism contributes to highlighting national identity and boosting investment in this sector. The study aimed to explore the role of social media platforms in promoting local tourism within Jordanian society. A structured questionnaire was developed to fulfill the study's objectives using the survey method for data collection. The research targeted a purposive sample of 400 individuals who actively use social media platforms and depend on them as a primary source of information about local tourism in Jordan. The study results indicated that respondents encountered local tourism topics in Jordan through social media platforms to a moderate degree, and the main motivation for this exposure was the desire to see tourist destinations in Jordan and learn about others' experiences in them. It also showed that the prevailing issues related to local tourism in Jordan are those that respondents interact with greatly through social media platforms, specifically with offers and discounts provided by tourism and travel companies, which aim to encourage Jordanians to explore and visit tourist sites within Jordan, in addition to following content that displays tourists' experiences and recommendations about the best tourist places and activities. The study also revealed that promotional content that relies on digital influencers increases the level of user engagement and positively affects their tourism decisions. The study recommends organizing a series of discussion sessions, awareness-raising events, and specialized seminars, and launching training programs targeting various segments of society throughout Jordan. These efforts focus on raising awareness of the importance of local tourism and its role in supporting the national economy while highlighting the cultural and heritage aspects that distinguish Jordan.

Keywords: digital media, social media platforms, tourism promotion, tourisim indusrty, Jordanian people

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INTRODUCTION

Jordan is a prominent tourist destination for visitors from different countries, due to its attractive components that meet the desires of travelers. It is worth noting that its political stability, unique geography, stunning natural landscapes, and rich historical heritage stand out as important factors. The tourism sector contributes significantly to enriching Jordan's economy, contributing about $7 billion annually. The tourism sector ranks second as the largest private sector in employment and ranks first as a major contributor to foreign currency in Jordan. The tourism sector in Jordan is a vital component that stimulates the national economy, contributing about 15.6% to the GDP (Ministry of Tourism and Antiquities, 2024). Advertising and publicity promote local and international tourism. Globalization facilitated the entry of international corporations and the proliferation of tourism and travel firms, which increased demand for tourism resources because social media platforms promote tourism, and tourism companies and agencies promote tourism at home and abroad (Dwyer & Čavlek, 2019; Hatamleh et al., 2023). Communication and international collaboration are crucial in tourism communities, significantly impacting societal ideas and trends. Tourism activities are regarded as primary motivators for visitors, enabling them to engage in tourism and make informed decisions through appealing media content related to tourism services and facilities. Consequently, the significant and essential function of social media platforms in bolstering the tourism sector becomes evident, facilitated by the application of innovative and effective promotional technologies for tourism (Abdel Aziz, 2023; Eneizat et al., 2023a).

Recent reports indicate that domestic tourism in Jordan needs further development to enhance it. By the end of 2023, domestic tourism in Jordan accounted for nearly 25% of total tourism activity, which necessitates increased efforts from the public and private sectors to enhance the role of domestic tourism in supporting tourism activities in Jordan. The Ministry of Tourism indicates a decrease in the number of foreign tourists visiting Jordan due to the circumstances in the Middle East region (Jordan News Agency, 2024). Therefore, Jordan seeks to boost domestic tourism to compensate for the number of foreign tourists who avoid visiting the country, especially during regional and global crises.

This study aims to ascertain the influence of social media platforms on the promotion of local tourism from the perspective of the Jordanian populace. Recently, relevant governmental and private entities in Jordan have intensified their focus on leveraging social media to encourage domestic tourism, particularly to motivate Jordanians to visit local attractions. This initiative is crucial, given that Jordanians expend 1.6 billion dinars annually on foreign tourism, intending to augment tourism revenue and thereby bolster the national budget, which funds various services for Jordanian society

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(Ministry of Tourism and Antiquities, 2024). Public and private institutions in the tourism sector have executed numerous advertising initiatives and media activities to promote tourist destinations in Jordan via social media platforms.

Study Questions

1. What is the degree of exposure of the Jordanian public to social media platforms?
2. What are the reasons for the Jordanian public's exposure to topics of local tourism in Jordan through social media platforms?
3. What topics related to local tourism in Jordan do the Jordanian public follow on social media platforms?
4. What are the cognitive, and behavioral effects resulting from the exposure of the Jordanian public to topics of local tourism in Jordan through social media platforms?

Research Hypotheses

1. There is a correlation between the cognitive effects of the Jordanian public's exposure to local tourism topics in Jordan via social media platforms and the emotional effects of this exposure.
2. There is a correlation between the cognitive effects of the Jordanian public's exposure to local tourism topics in Jordan via social media platforms and the behavioral effects of this exposure.
3. There is a correlation between the emotional effects of the Jordanian public's exposure to local tourism topics in Jordan via social media platforms and the cognitive effects of this exposure.

The significance of the study

The theoretical importance of this study lies in the fact that it sheds light on the role of social media platforms as a modern and effective tool in the field of promoting local tourism, which contributes to bridging a knowledge gap in the literature related to tourism media in Jordan. The study also provides a qualitative addition to the Arab library by analyzing the relationship between the Jordanian public's use of social media platforms and their impact on enhancing awareness of local tourism. The study focuses on exploring usage patterns and the most prominent topics of interest to the public, which supports the development of more effective strategies for tourism promotion and enhances understanding of the role of digital media in this field. The practical importance of this study is evident in providing practical recommendations that can contribute to enhancing the role of social media platforms in promoting local tourism in Jordan. By understanding the Jordanian audience's usage patterns of these platforms and the reasons for their following tourism topics, tourism establishments and the Jordan Tourism Board can design innovative and effective marketing strategies that directly target the audience. The study can also be a practical reference for decision-makers in the tourism sector to develop awareness programs, workshops and training courses that enhance community awareness of the importance of local tourism, and work to improve public facilities and services to meet visitors' needs and enhance the local tourism experience.

LITERATURE REVIEW

This study (Wilopo & Nuralam, 2025) examines how interactivity, attitudes, and e-promotion affect tourist satisfaction and revisit intention in tourism marketing using social media. This quantitative study employs partial least squares structural equation modelling (PLSSEM) to examine both exogenous and endogenous models to recognise destination marketing organisations' crucial influence in tourist behaviour. Slovin's algorithm was used to identify 271 international tourists who visited Indonesia. Interactivity and attitudes considerably increase tourist pleasure, while e-promotion does not. Tourist pleasure also strongly influences return. Tourist pleasure mediated interactivity, attitudes, and revisit intention, while e-promotion was unimportant. This study highlights interaction and trends as more influential factors in social media marketing, deepening DMO destination branding methods. This study (Chon & Hao, 2025) examines how technological advances have affected tourism from the post–Second World War era to the present and through 2050.

It examines how technology has changed travel experiences and operations, focussing on the metaverse, Web 3.0, and AI and their effects on sustainable and ethical tourism. This hybrid study analyses history and predicts the future. It examines industry records, historical data, and scholarly literature. Commercial aviation, the internet, and AI have all had major impacts on tourism, according to this study. Future trends imply new technologies will revolutionise the sector. Future growth must address environmental, ethics, and inclusion issues.

This study (Stylianou & Pericleous, 2025) examines how technological advances might put Cyprus at the forefront of sustainable tourism from policymakers' viewpoints. The effects, constraints, and prospects of incorporating technology into Cyprus tourism are examined. A focus group of nine Cyprus tourism policymakers was used for qualitative study. A thematic analysis was done on the data. The results showed that Cypriots must pay hefty fees, complete lengthy processes, and use outmoded technology to advance in this profession. The appreciation of technological progress shows that many new concepts aim to overcome these obstacles, such as introducing new technologies in tourism marketing and developing smart systems to facilitate tourism procedures, which promote sustainable tourism and improve visitor experiences.

The study (Al-Shiha, 2024) used a descriptive-analytical approach in the practical and theoretical aspects to examine the relationship between digital marketing strategy and the attractiveness of heritage and cultural tourism in Saudi Arabia, as well as the impact of determining the goal or purpose when applying the strategy. The researcher collected data via computerised questionnaire. The study found that there is a statistically significant effect (goal setting step/marketing content/marketing channel/audience elements) when applying the digital marketing strategy to enhance heritage and cultural tourism in Saudi Arabia, and that each element of the strategy has a positive and noticeable effect. It also found that the digital marketing strategy explains 58.6% of the change in heritage and cultural tourism in Saudi Arabia.

The study (Qawi & Baroud, 2023) aimed to highlight the role and importance of e-tourism marketing by influencing the elements of the tourism marketing mix, through the descriptive analytical approach. The study found that Algerian tourism businesses can best, fastest, and most effectively recover from the Corona outbreak by using current communications technologies. It also determined that e-tourism marketing is essential for any tourist activity due to its dependency on current communications and technology. It determined that the e-tourism marketing mix uses the Internet and IT to satisfy tourists originally. The study (Tajin, 2023) aimed to clarify the impact of e-marketing on improving the quality of tourism services in hotels located in Biskra. The descriptive approach was used, where a questionnaire was distributed to a study sample of 128 hotel customers in the city of Biskra. The study indicates that there is a statistically significant impact of e-marketing on improving the quality of tourism services in hotels in Biskra. It concluded that using hotels as a basic measure for evaluating e-marketing significantly increased the effectiveness of e-marketing in improving the quality of tourism services within hotels.

The study (Basi, 2023) E-marketing's significance in boosting tourism services for Biskra tourism agencies was examined using a descriptive-analytical technique. The study yielded that e-marketing plays a crucial role in enhancing the quality of tourism services offered by agencies and significantly improving the tangible aspects of these agencies through the availability of electronic resources. It also indicated that e-marketing is a crucial method for entities and organizations aiming to disseminate information efficiently and rapidly, while minimizing expenses and facilitating direct communication with clients.

The study (Al-Nawafah, 2022) examined how public relations operators in the tourism sector use social media platforms to promote Jordanian domestic tourism, the most popular social media platforms, and the benefits of using applications to achieve the goals of Jordanian public and private tourism institutions, bodies, and organizations. Comprehensive survey methods were used to survey 220 Jordanian public and private tourist PR practitioners.

The study found that social media platforms are crucial to promoting Jordanian tourist destinations and are a main source of information regarding cultural and therapeutic tourism. It also found that public relations experts use photographs and videos on social media to promote Jordanian tourism.

The study (Jaya et al., 2020) examines how social media influencers affect brand image and how tourism places affect Lake Bratan tourists' purchasing intentions. This convenience sample of 179 foreign tourists may represent the study population. This study found that social media influencers boost tourism destinations' brand image. Brand image has a greater correlation coefficient, the study found. It also revealed that tourist site management must examine quality, reliability, track record, and quality reached in addition to the amount travellers pay for advantages and amenities.

This study (Cholprasertsuk et al., 2020) examined the impact of social media influencers on Thailand's tourism industry, focussing on two main questions: how do social media influencers affect Thai tourist behaviour, and what motivates and marketing factors drive such behaviour. an online questionnaire, interviews was using to gether data form respondetns. the discovery that most travellers seek travel advice from social media influencers to avoid poor experiences. The results demonstrated that platform influencers influence tourism customer decision-making. Participants preferred to get travel advice from experienced and knowledgeable tourism influencers, one of the factors affecting tourist behavior and willingness to travel. It also shows social media influencers have a big impact on tourism consumer decision-making because most visitors seek advice or useful information about vacation arrangements to avoid issues.

Recent studies indicate the significant role played by social media platforms in influencing tourist behavior. Despite the success of these platforms in promoting tourism in many developed and developing countries, studies on their impact in the Jordanian context are still limited. Therefore, this study aims to bridge this gap by exploring the impact of digital platforms on domestic tourism in Jordan. The research seeks to study the mechanisms by which social media platforms affect tourism dynamics in the digital age, and to provide insights that contribute to the development of targeted tourism marketing strategies, which helps in exploiting the potential of digital media to enhance tourism and cultural promotion in Jordan.

MATERIALS AND METHODS

Research design

The present research is categorized as a descriptive study that seeks to attain a precise understanding of issues and events through the examination of their components, variables, elements, characteristics, and influencing factors. It aims to provide adequate information for analysis and interpretation, to identify effects and implications, and to formulate suitable procedures and solutions to address, develop, modify, complete, or forecast their future (Ahmad, 2022; Eneizat et al., 2024).

In the context of descriptive studies, the researcher employed the audience survey method to ascertain the opinions, trends, and perspectives of the public or a specific demographic regarding a particular phenomenon, topic, or issue addressed by the media (Ahmad et al., 2023; Alsharu et al., 2025; Eneizat et al., 2023b). This method was implemented on a sample of the Jordanian public to evaluate the role of social media platforms in enhancing Jordanian domestic tourism.

Population and sample of the study

The study community consists of all Jordanian people. A deliberate sample of (400) individuals was selected from the Jordanian public who rely on social media platforms Facebook, X, and Instagram when searching for travel sites, and tourist and archaeological sites in Jordan. A questionnaire was prepared and delivered electronically to Jordanian social media users who research local tourism. Participant questionnaire responses were graded using the following scale: The degree of Jordanian public exposure to local tourist subjects in Jordan through social media was measured using this three-point Likert scale, which indicates respondents' agreement with the questionnaire axes.

The scale was interpreted as follows: 1.00 – 1.66 = Low, 1.67 – 2.00 = Medium, and 2.34 – 3.00 = High. This five-point Likert scale was used to assess the reasons why Jordanians use social media to keep up with local tourism topics,

the topics they follow, and the behavioral, cognitive, and emotional effects of this exposure. The scale was interpreted as follows: 1 – 2.33 = Low, 2.34 – 3.67 = Medium, and 3.68 – 5.00 = High.

Validity and Reliability tests

Using the method of apparent validity or content validity, the study tool (questionnaire) was presented to several specialized academics from media faculties to determine the validity of its phrases and ensure its ability to measure what it was built for, achieve the objectives of the current study, answer its questions, and be suitable for testing hypotheses.

Moreover, SPSS was used to calculate the stability coefficient (Cronbach Alpha) to assess questionnaire items' internal consistency. A Cronbach Alpha coefficient of 60% or higher is acceptable. The reliability coefficient obtained ranged from 91.1% to 92.5%, as indicated in Table 1, all of which are highly acceptable in social science research.

Table 1. Cronbach Alpha results

Questionnaire	Cronbach Alpha
Cognitive effects of Jordanian public exposure to local tourism topics in Jordan via social media platforms.	%90.1
Affective effects of Jordanian public exposure to local tourism topics in Jordan via social media platforms.	%92.5
Behavioral effects of Jordanian public exposure to local tourism topics in Jordan via social media platforms.	%91.8

Table 2. The degree of exposure of respondents to local tourism topics in Jordan via social media platforms of the respondents

platforms	Mean	SD	Degree
Facebook	2.47	0.468	High
Instagram	2.18	0.512	Medium
X	1.60	0.447	Low
Overall average	**2.08**	**0.476**	**Medium**

RESULTS AND DISCUSSIONS

The degree of exposure of the Jordanian public to social media platforms.

Table 2 shows that respondents are moderately exposed to Jordanian tourism topics on social media, with Facebook being the most popular platform (2.47) and a high degree, followed by Instagram (2.18) and X platform (1.60).

Since Jordan is the oldest Facebook user, these results suggest that the public is highly exposed to Facebook. Since its debut in this century, the Jordanian public has followed this platform more. Many recent media studies have shown that the Jordanian public is highly exposed to Facebook, while X and Instagram platforms are late adopters, but their usage is rising. These findings are consistent with Muhammed & Mathew (2022), which found a big social media user base.

The results of this study show a significant impact of social media platforms in promoting domestic tourism, as they contribute to shaping the public's perceptions and choices regarding tourist destinations. This is consistent with previous studies that have confirmed the role of digital content in building mental images and users' expectations about certain locations (Lam et al., 2020). The active engagement of Jordanians with platforms such as Facebook reflects the potential of these media as effective tools for marketing domestic tourism, by displaying attractive visual content that highlights the beauty of local destinations. This content can motivate the public and influence their decisions to travel within the country, a phenomenon supported by research on the impact of media on tourism (Choe et al., 2023). The correlation between increased engagement with tourism content on these platforms and increased interest in local destinations also supports the idea that the continuous repetition of displaying images and information about certain destinations contributes to enhancing positive perceptions and travel intentions (Wati et al., 2022).

The findings also showed that social media platforms promote local tourism locations by showing users' personal experiences in photographs and videos, which raises audience interest. The rise of Instagram and Facebook demonstrates that compelling visual content influences local travel preferences. This raises problems regarding how local destinations are represented relative to international locations and how stakeholders might use these platforms to promote local tourism. Studies show that investing in high-quality local content can boost tourism, the local economy, and audience engagement. Media influences tourism preferences, as shown by earlier studies (Liu et al., 2021; Kim & Park, 2024).

Table 3. Reasons for respondents' exposure to local tourism topics in Jordan via social media platforms

Reasons	Mean	SD	Degree
To view tourist places in Jordan.	4.37	0.642	High
To view archaeological sites in Jordan.	4.22	0.574	High
Because it is the most interactive among other media in Jordan.	4.01	0.612	High
Because it is the fastest among other media in publishing information related to local tourism in Jordan.	3.77	0.512	High
Because it is the most capable of archiving information related to topics of local Jordanian tourism.	3.64	0.462	Medium
To obtain information about tourist places that can be visited in the winter.	3.49	0.497	Medium
To obtain information about tourist places that can be visited in the summer.	3.33	0.441	Medium
Because it is the most widespread among the Jordanian public.	3.17	0.579	Medium
To obtain information about updates to tourist places in Jordan	3.08	0.543	Medium
Because it is the least expensive among other media to access information related to tourism in Jordan.	3.02	0.551	Medium
Overall average	**3.61**	**0.541**	**High**

Reasons for exposure to local tourism topics in Jordan via social media platforms

Table 3 shows that “to view tourist places in Jordan” had the highest arithmetic mean (4.37) and high score for respondents' social media exposure to local tourism topics in Jordan, followed by “to view archaeological sites in Jordan” (4.22). The least reasons for exposure were “to obtain information about updates to tourist places in Jordan” (3.08) and a medium score, and “because it is the least expensive among other media to access information related to tourism in Jordan” (3.02). These findings suggest that the Jordanian public has tourist reasons and motives to view and learn about tourism topics in Jordan, given the large volume published by official and private tourism agencies on domestic tourism sites for internal affairs, especially viewing tourist and archaeological sites, which the researcher found to be high level. Moreover, the study found that social media platforms are the most effective and fastest at publishing information about local tourism topics in Jordan, so the Jordanian public is interested in following them to learn about tourist and archaeological sites, their visit dates, costs, and updates. The study's results are consistent with Al-Nawafah (2022) and Omeish et al. (2024), which indicated the great importance played by social media in activating the tourism sector. However, this result differed from Al-Rafei's (2019) which showed the medium role of communication platforms in promoting tourism in Jordan in all dimensions.

Table 4. Cognitive effects resulting from the respondents’ exposure to local tourism topics in Jordan via social media platforms

Items	**Mean**	**SD**	**Degree**
Provided me with information about the best Jordanian tourist places to visit.	4.05	0.561	High
Provided me with information that increased my ability to form a positive viewpoint about Jordanian tourist places.	3.84	0.572	High
Provided me with information about Jordanian archaeological sites to visit.	3.71	0.583	High
Provided me with information to form positive perceptions about the developments that have occurred in the Jordanian tourism sector.	3.62	0.577	Medium
Provided me with information that enhanced my mental stock of Jordanian tourist places.	3.55	0.510	Medium
Overall average	**3.75**	**0.561**	High

Cognitive effects of exposure to local tourism topics in Jordan

Table 4 demonstrates that respondents' cognitive impacts from social media exposure to Jordanian tourist subjects were high, in order: The first statement, “Provided me with information about the best Jordanian tourist places to visit” (4.05), was followed by “Provided me with information that increased my ability to form a positive viewpoint about Jordanian tourist places” (3.84). While “Provided me with information to form positive perceptions about the developments that have occurred in the Jordanian tourism sector” had an arithmetic mean (3.62) and a medium degree, and “Provided me with information that enhanced my mental stock of Jordanian tourist places” had an arithmetic mean (3.55) and a medium degree. The cognitive effects of exposure to local tourism topics in Jordan include several aspects, such as promoting local tourism in Jordan from the Jordanian public's point of view by providing the public with the necessary information about the best Jordanian tourist places to visit and archaeological sites increases the ability to form a positive viewpoint about Jordanian tourist and heritage sites.

The items "It provided me with information to form positive perceptions about the developments that have occurred in the Jordanian tourism sector" as well as "It provided me with information that enhanced my mental stock of Jordanian tourist places" were medium. This suggests that different effects affect the provision of information about Jordanian tourism sector developments, which should encourage Jordanian tourism institutions to increase promotional campaigns for tourist site developments to improve public perception of local tourism.

This result is consistent with the study (Kumar et al., 2022), which confirmed that tourism agencies' use of Facebook to market tourism services has a significant impact and that the platform can overcome a large number of marketing obstacles facing places and their information, as a percentage of Jordanians are interested in these details. This differs from Boutgrin (2018), which found a medium cognitive impact of social media use and a statistically significant impact on tourism marketing, offering, service provision, distribution, pricing, promotion, and demand.

Table 5**.** Emotional effects resulting from the respondents’ exposure to local tourism topics in Jordan via social media platforms

Items	**Mean**	**SD**	**Degree**
It increased my desire to visit Jordanian tourist sites.	3.89	0.458	High
It increased my desire to visit Jordanian archaeological sites.	3.78	0.441	High
It increased my awareness of the importance of developing the infrastructure of the tourism sector in Jordan.	3.61	0.432	Medium
It increased my optimism about increasing the percentage of Jordanian tourists visiting tourist sites in Jordan.	3.55	0.494	Medium
It increased my optimism about increasing the tourism sector's contribution to supporting the Jordanian state's general budget.	3.47	0.443	Medium
Overall average	**3.66**	**0.454**	**Medium**

Emotional effects of exposure to local tourism topics in Jordan

Table 5 shows that the respondents' emotional effects from social media exposure to local tourism topics in Jordan were medium, with the following order: “It increased my desire to visit Jordanian tourist sites” (3.89) and a high degree, followed by “It increased my desire to visit Jordanian archaeological sites” (3.78) and a high degree. While, "It increased

my optimism about increasing the percentage of Jordanian tourists visiting tourist sites in Jordan" and "It increased my optimism about increasing the tourism sector's contribution to supporting the Jordanian state's general budget" had arithmetic means of 3.55 and 3.47, respectively and a medium degree.

These results indicate significant confidence in increasing respondents' interest in visiting Jordanian tourist and archaeological sites. This is due to social media promoters' increased persuasion and the Jordanian Ministry of Tourism and Tourism Promotion Authority's efforts to increase public interest in tourist and archaeological sites through appropriate promotional publications and advertisements. The respondents exhibited growing optimism regarding the tourism sector's impact on the Jordanian state budget, the proportion of Jordanian tourists frequenting local attractions, and the necessity for enhancing tourism infrastructure. However, these factors were deemed the least influential, as the Jordanian public struggles that the sector necessitates greater activation and local tourism initiatives.

This is particularly pertinent given the substantial deficit in the Jordanian general budget, which demands diverse revenue streams for mitigation, with the tourism sector being well-positioned to boost the Jordanian economy. This supported the study (Omeish et al., 2024) that found respondents trust social media tourism promotion. The study also found that all respondents utilize social media and that tourism institutions use it as a marketing tool.

Table 6. Behavioral effects resulting from the respondents' exposure to local tourism topics in Jordan via social media platforms

Items	Mean	SD	Degree
It prompted me to visit tourist places in Jordan.	3.88	0.411	High
It prompted me to join groups that coordinate local tourist trips.	3.77	0.453	High
It prompted me to participate with my friends in discussions related to Jordanian tourism topics.	3.38	0.442	Medium
It prompted me to share videos and promotional advertisements for Jordanian tourist places on social media platforms.	3.29	0.438	Medium
It prompted me to share offers provided by local tourism and travel companies on social media platforms to encourage local Jordanian tourism.	3.22	0.429	Medium
Overall average	**3.42**	**0.435**	**Medium**

Behavioral effects of exposure to local tourism topics in Jordan

Table 6 reveals that respondents' exposure to social media for Jordanian tourism topics had moderate behavioral effects in the following order: "It prompted me to visit tourist places in Jordan" with an arithmetic mean (3.77) and a high degree, followed by "It prompted me to join groups that coordinate local tourist trips" (3.54) and a medium degree. Then "It prompted me to share videos and promotional advertisements for Jordanian tourist places on social media platforms" with an arithmetic mean (3.29) and a medium degree, and finally "It prompted me to share offers provided by local tourism and travel companies on social media platforms to encourage local Jordanian tourism" with an arithmetic mean (3.13) and a medium degree. These results can be interpreted as following up on the behavioral impacts of respondents' exposure to local tourism topics in Jordan via social media platforms, which prompted some respondents to take clearer and more detailed positions on local tourism topics and to search for more information to deepen their understanding of everything related to tourism in Jordan. In addition, local tourism topics may be the focus of discussions between friends on social media platforms, and these discussions may encourage some respondents to participate actively in expressing their tourism opinions and share them on their pages on social media platforms. The study's result agreed with the study (Chon & Hao, 2025), which showed that technological development contributed to the emergence of social media platforms that facilitated the tourist's access to all data through the Internet. It also showed that social media platforms play an important role in fulfilling the tourist's desires and satisfying his basic needs.

Hypotheses tests

Hypothesis 1: There is a correlation between the cognitive effects of the Jordanian public's exposure to local tourism topics in Jordan via social media platforms and the emotional effects of this exposure.

Table 7. Hypothesis Testing Results

Cognitive effects of exposure to local tourism topics in Jordan			
Emotional effects	Frequency	Pearson Correlation	Sig
	400	0.610	0.000

Table 7 presents the Pearson Correlation coefficient, which reveals a statistically significant positive correlation between the cognitive effects of respondents' exposure to local tourism topics in Jordan through social media platforms and the emotional effects stemming from this exposure. The Pearson correlation coefficient is (r=0.610) with a significance level of (0.000), indicating statistical significance at the (0.05) level. This suggests that an increase in cognitive effects correlates with an increase in emotional effects.

Social media platforms play an important role in shaping individuals' awareness and feelings towards local tourism. At the cognitive level, exposure to local tourism content enhances knowledge of tourist sites, available activities, and local culture, which increases individuals' perception of the value of these destinations. At the emotional level, this exposure may evoke positive feelings such as enthusiasm, national pride, or a desire to explore these places. This association reflects the close interaction between mental and emotional aspects, where increased knowledge leads to

enhanced positive feelings, which may prompt individuals to adopt behaviors that support local tourism, such as visiting or promoting it. This highlights the importance of digital marketing strategies that target the provision of attractive and influential tourism content on social platforms to achieve comprehensive and integrated effects.

This study supports recent results that social media influences local tourism knowledge and views. Sun et al. (2022) investigated how social media affects tourist behavior and location choices. Majeed & Ramkissoon (2022) found that social media is a mediator between tourists' behavioral goals and destination choices. Another study on Generation Z studied how social media affects destination preference, emphasizing its role in tourist decision-making. These studies emphasize the necessity of digital marketing tactics that supply attractive and impactful tourism content on social platforms for comprehensive and integrated effects.

Hypothesis 2: There is a correlation between the cognitive effects of the Jordanian public's exposure to local tourism topics in Jordan via social media platforms and the behavioral effects of this exposure.

Table 8. Hypothesis Testing Results

Cognitive effects of exposure to local tourism topics in Jordan			
Behavioral effects	**Frequency**	**Pearson Correlation**	**Sig**
	400	0.514	0.000

Table 8 presents the Pearson Correlation coefficient, demonstrating a statistically significant positive correlation between the cognitive effects of respondents' exposure to local tourism topics in Jordan through social media platforms and the resultant behavioral effects. The Pearson correlation coefficient was determined to be r=0.514, with a significance level of 0.000, indicating statistical significance at the 0.05 level. This suggests that an increase in cognitive effects due to exposure correlates with an increase in behavioral effects.

This hypothesis refers to the prominent role that social media platforms play in influencing individuals' perceptions and behaviors towards local tourism. When users are exposed to content related to local tourism, such as photos of tourist sites, cultural stories, or personal experiences shared by others, this content contributes to increasing their knowledge of these destinations and enhancing their interest in them. This exposure is not limited to improving knowledge only but extends to motivating individuals to take actual steps, such as visiting tourist sites or talking about them and promoting them among their acquaintances. The positive relationship between cognitive and behavioral effects means that improving individuals' awareness of tourist sites directly leads to motivating them to make decisions and behaviors that support the tourism sector.

Recent studies support the findings of this study, such as Liu et al. (2021) found that high-quality images and engaging stories on social media platforms significantly improve tourists' perceptions of destinations, increasing their interest and behavioral intentions to visit. Singh et al. (2023) examined the cognitive and behavioral effects of local tourism information on social media. It found that people who frequently connect with such content are more likely to form good opinions and promote local tourism by recommending destinations to friends or discussing their experiences online. Choi et al. (2023) found that tourism-related social media content that emphasizes destinations' cultural and historical aspects strengthens emotional connections and encourages visitors to visit.

Hypothesis 3: There is a correlation between the emotional effects of the Jordanian public's exposure to local tourism topics in Jordan via social media platforms and the behavioral effects of this exposure.

Table 9. Hypothesis Testing Results

Behavioral effects of exposure to local tourism topics in Jordan			
Emotional effects	**Frequency**	**Pearson Correlation**	**Sig**
	400	0.498	0.000

Table 9 shows the Pearson correlation coefficient indicating a statistically significant positive association between the emotional effects experienced by respondents due to their exposure to local tourism topics in Jordan through social media platforms and the behavioral effects resulting from this exposure. The Pearson correlation coefficient value is (r=0.498) at the significance level (0.000), and it is statistically significant at the level (0.05), indicating that an increase in emotional effects is associated with an increase in behavioral effects.

The hypothesis suggests that there is a statistically significant positive relationship between the emotional effects that individuals feel as a result of their exposure to local tourism content in Jordan via social media platforms, and the behavioral effects that result from this exposure. This means that the more intense the emotional effects - such as admiration for natural scenery, pride in local landmarks, or desire to explore them - the more likely these feelings are to be embodied in tangible behaviors, such as visiting or promoting tourist sites. The result demonstrates the impact of digital information on decision-making and behavior, inspiring individuals through emotional engagement, and leading to positive behavioral reactions. This finding emphasizes the need to invest in high-quality digital tourism content to attract public interest and encourage active participation in promoting local tourism.

Recent research confirms that emotional involvement with digital tourism information affects behavioral goals like visiting or promoting tourist places. Tourism digital content marketing research shows that emotional involvement drives trip planning (Cheung et al., 2023). Emotional content influences travel intentions, according to Instagram's impact on young people's travel behavior (Atasoy & Türkay, 2024). Finally, a study on emotional content and consumer engagement shows how emotional engagement affects behavioral decisions like sharing and promoting material (Hollebeek & Macky, 2019). These studies show that emotional engagement in digital tourism marketing can motivate site visits.

CONCLUSION

This study demonstrates that social media platforms are crucial in enhancing local tourism in Jordan, serving as an effective tool for capturing residents' attention and motivating them to discover domestic tourist sites. Engagement with tourism subjects on these platforms was moderate, motivated by individuals' interest in Jordanian tourist locations, particularly the offerings from tourism and travel companies. This study also emphasizes the importance of enhancing the use of social media platforms as a marketing tool to promote local tourism by improving the quality of content and increasing interaction with the public. It also highlights the need to invest more in these platforms to highlight the beauty of tourism in Jordan, which contributes to supporting and revitalizing the tourism sector, which positively reflects on the national economy.

Limitations

The limitations of the study relate to several factors that may affect the research results and limit their generalization on a wider scale. First, the study relied on a purposive sample of 400 individuals who actively use social media platforms, which may limit the sample's representation of all segments of Jordanian society. In addition, the study targeted a specific category of individuals who rely on social media platforms as a primary source of information about local tourism, which may affect the study results for those who do not use these platforms regularly. Second, the study was limited to collecting data using a survey and questionnaire method, which may not allow for sufficient depth in fully understanding the motivations and factors influencing individuals' behavior. Finally, the study focused on local tourism in Jordan only, which makes its results not generalizable to tourism in other countries with different tourism characteristics.

Recommendations

The study recommends conducting future studies that aim to analyze the impact of advertising campaigns via social media platforms on individuals' behaviors regarding local tourism in Jordan. These studies could include examining the impact of psychological and emotional factors on tourism decision-making, in addition to studying the effectiveness of different digital marketing strategies in attracting local tourists. It is also suggested to conduct comparative research on the impact of social media platforms on local tourism in Jordan compared to other countries, to explore the best practices that can be adopted to promote domestic tourism. It is also important to conduct field studies to measure the impact of training programs and awareness events on individuals' behaviors, and how to improve these programs to reach the largest number of citizens.

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SURVIVAL AND DEVELOPMENT: RESEARCH ON CHINESE HIGHER EDUCATION DURING THE WAR OF RESISTANCE AGAINST JAPANESE AGGRESSION (1931-1945)

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Abstract: China's higher education system demonstrated remarkable resilience during the War of Resistance Against Japanese Aggression (1931–1945), a period marked by national crisis, instability, and widespread destruction. Universities and colleges were forced to evacuate from war-torn regions, often relocating to remote and underdeveloped areas in the country's interior. Despite facing immense logistical and resource-related obstacles, these institutions continued to function, embodying the spirit of Higher Education Resilience. This study investigates how Chinese universities adapted under wartime conditions, focusing specifically on how they preserved Educational Quality, aligned with National Defense, and maintained Intellectual Independence in the face of adversity. Drawing on 17 semi-structured interviews with scholars, educators, and individuals closely connected to this historical period, the research employs a qualitative methodology grounded in thematic analysis. The three-step coding process revealed critical themes that capture the multifaceted response of higher education institutions during the war. Among the most significant were the adaptability of academic administration, innovation in curriculum design to support National Defense Alignment, and the maintenance of academic rigor despite the scarcity of materials and infrastructure. A notable outcome of university relocation was the unintentional stimulation of regional development, as academic institutions brought intellectual resources and cultural vitality to inland provinces. Participants also emphasized that universities served as crucial sites for sustaining Chinese cultural identity, promoting national unity, and resisting intellectual repression, thereby safeguarding Intellectual Independence. Despite the physical and psychological toll of war, faculty and students persevered, contributing to both the war effort and the preservation of knowledge. This research contributes new perspectives to the discourse on crisis-era education by highlighting how higher education can remain robust even in extreme conditions. The findings illustrate that Higher Education Resilience is not merely institutional survival, but also the capacity to uphold core educational values and respond to national needs. Ultimately, the study underscores that universities play a vital role in national recovery and development, particularly in times of profound turmoil.

Keywords: Higher Education Resilience, War of Resistance Against Japanese Aggression, Educational Quality, National Defense Alignment, Intellectual Independence

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INTRODUCTION

The War of Resistance Against Japanese Aggression (1931-1945), commonly referred to as the Second Sino-Japanese War, was a pivotal conflict in modern Chinese history that set the stage for profound social, political, and economic transformations (Gordon, 2006). The war began with Japan's invasion of Manchuria in 1931 and escalated into a full-scale war in 1937, culminating in significant hostilities that lasted until the conclusion of World War II in 1945 (Gruhl, 2017). Chinese inhabitants saw everyday instability, civilian crimes, and violent military battles throughout this time. Tens of thousands were killed and many more brutalized in the 1937 Nanjing Massacre. Nanjing was known for its suffering. The complex political environment and the invasion's impact on China's Nationalist government under Chiang Kai-shek and the Communist Party under Mao Zedong affected the public's response (Alitto, 2023).

Chinese higher education was crucial throughout the crisis. Higher education institutions are vital hubs for intellectual, social, and political discourse, shaping national identity and preserving the nation. Universities produced and preserved knowledge during wartime as academics and students upheld academic rigor while fighting foreign invasion (Dryburgh, 2022). Fighting forced several colleges, including Peking and Tsinghua, to move to safer western and southern China (Table 1). This method preserved educational continuity and allowed these institutions to realign their goals with societal needs throughout the crisis (Elman & Woodside, 2023). Higher education also promoted national unity and awareness. Universities were hubs of political mobilization and civic engagement, with students protesting the Japanese and supporting the war via research, propaganda, and community service. Some students joined the military, while others did educational outreach to boost battle spirit. Higher education and nationalistic passion helped develop a collective Chinese identity during a difficult time, spurring tenacity and defiance.

After the conflict, higher education curriculum and teaching methods changed significantly. As the battle worsened, technical and military education increased to meet national needs. To align education with state goals, institutions adjusted their curricula to teach national military, agricultural, and wartime industrial skills (Hu, 2021). This adaptability showed that higher education is crucial to national survival and advancement during a crisis, as well as intellectual development.

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Higher education institutions' resilience throughout the War of Resistance Against Japanese Aggression shows their adaptability (Garver, 2016). Despite resource shortages, dislocation, and political constraints, universities fulfilled their basic goals while supporting national defense and recovery. Chinese higher education's turbulent past shows how educational institutions may stabilize, innovate, and evolve throughout crises (Alitto, 2023).

Table 1. Key historical events impacting Chinese higher education (1931-1945)

Year	Event	Impact on Higher Education
1931	Japanese invasion of Manchuria	Universities in Manchuria forced to close or relocate; increased focus on national defense.
1937	Outbreak of full-scale war between China and Japan	Many universities relocated to western China; disruption of academic activities.
1937	Nanjing Massacre	Major universities in Nanjing shut down or moved; widespread destruction of facilities.
1938	Relocation of Peking University, Tsinghua University, and Nankai University to Kunming	Formation of the National Southwestern Associated University; ensured educational continuity.
1941	Entry of the United States into World War II	Increased international collaboration in education; military training integrated into curricula.
1945	End of World War II and Japanese surrender	Universities begin reconstruction; focus shifts to rebuilding the educational system.

Previous research on violence in schools had some interesting findings. Some scholars have shown that higher education institutions survived and helped national resilience and recovery (Liu, 2023). Colleges helped shape national identity throughout wartime by fostering a sense of community and purpose among students and faculty. Previous studies have highlighted the importance of educational quality during crises, showing how institutions may adapt their curriculum to meet societal needs (Peng, 2023). Despite such contributions to the subject, we still have no idea about how higher learning institutions responded to the war, especially during the Resistance Against Japanese Aggression (WU, 2020). The intellectual independence-national defense alignment-educational quality interrelationship in China has been sparingly researched amid considerable research into educational institutions' conflict resilience (Киселева, 2022). Previous studies tended to lack a comprehensive framework that addressed the various roles of higher education institutions during this momentous era. Intellectual freedom, coping, university migration, quality of education, alignment with national defense, and the function of higher education in regional development during times of war are investigated here to address these challenges. This research endeavors to investigate how higher education institutions adapt and thrive in spite of problems.

This study delves into the resilience of universities during the War of Resistance Against Japanese Aggression, focusing on how they adapted to overcome wartime challenges. It addresses how universities contributed to the development of the region, guaranteed the quality of education, and preserved intellectual independence while keeping up with national objectives. With a qualitative approach, the research employs semi-structured interviews with institutional leaders and educators who directly experienced the conflict, achieving valuable insights into the lived experience of higher education students during the period. Through an examination of the complex nature of educational resilience, the research provides additional insight into the interactive dynamics between education and sociopolitical contexts, achieving lessons for relevance in contemporary higher education institutions facing crises.

Beyond historical analysis, the findings will inform strategies for maintaining academic integrity, adapting to evolving societal needs, and ensuring institutional sustainability in uncertain times. The study offers significant implications for scholars, educators, and policymakers striving to enhance the resilience of modern higher education systems, emphasizing the critical role of education in societal development and crisis response while guiding institutions worldwide in fostering adaptability and long-term stability.

LITERATURE REVIEW

The War of Resistance Against Japanese Aggression (1931–1945) changed Chinese history by causing social upheaval and disaster in various locations (Alitto, 2023). Higher education has several challenges.

Chinese universities and colleges, once intellectual and cultural beacons, had to change after the war. Bombings, mandatory evacuations, and poor infrastructure forced several colleges to shift inside (Киселева, 2022). Chinese higher education has persevered despite many challenges. Paradoxically, the war years saved and advanced higher education, setting the groundwork for future developments. The linked academic conversation shows how higher education maintained national morale and intellectual energy throughout this tough time (Aso, 2024). Many experts believe higher education promotes intellectual inquiry and critical thinking despite external constraints. The move of institutions to impoverished areas during conflict exposed isolated individuals to new ideas and fostered regional prosperity, enabling higher education across China (Yu, 2013). Despite higher education's vital significance in the nation's survival, academic autonomy and integrity were threatened. Several factors emphasize the necessity of understanding higher education now. This significantly enhances crisis understanding of national survival, politics, and education.

Higher Education Resilience

Higher education resilience refers to universities' and colleges' capacity to endure, adapt, and recover from crises while sustaining their core missions of teaching, research, and community engagement (Baker, 2024). It involves the

ability to innovate in response to adversity, ensuring that educational institutions remain functional and relevant. During the War of Resistance Against Japanese Aggression (1931–1945), resilience in higher education was evident in institutions' efforts to sustain operations, safeguard intellectual vitality, and fulfill national needs despite wartime disruptions. Scholars such as (WU, 2020) have analyzed resilience in higher education through the lens of organizational resilience, examining how universities navigate economic, political, and social challenges.

Wei-mu (2021) expanded on this model by highlighting the importance of leadership, managing resources, and working with communities to keep higher education afloat in times of crisis. Chang (2021) also posited that universities, in the past, redefined themselves during wars by utilizing difficulties as drivers of development, as was witnessed during the World Wars in Europe and America. In the Chinese setting, scholars have well-documented the resilience of universities against external limitations, with special focus on the impact of war on education.

These universities not only sustained education provision but also helped in military and societal demands, strengthening their crucial function in national stability. In addition, discussed postwar changes in resilient institutions and maintained that wartime adaptations left an enduring legacy in China's educational system. The authors' research highlights the necessity of incorporating historical experiences into current education, insisting that resilience in higher education transcends crisis management to influence long-term academic and societal development.

University Relocation

University migration may be spurred by conflict, natural disasters, political instability, and economic hardship, frequently compelling institutions to reshape departments, relocate campuses, or transfer staff and students temporarily or permanently, all of which have implications for culture, academic programs, community outreach, institutional mission, and logistics of educational provision (Henshaw, 2024). During the War of Resistance Against Japanese Aggression (1931–1945), Chinese universities had to move in large numbers, heavily influencing education. Institutional mobility has attracted extensive research with studies identifying not only the shortcomings but also advantages of wartime and disaster-induced university relocations. Hu (2021) pioneered research on adapting institutions to climate change, emphasizing the dedication of universities to delivering education in adverse conditions, and Garver (2016) examined how wartime relocations caused schools to conserve cultural and scholastic norms.

The wartime displacement of students and teachers has been recognized as a watershed occasion that ushered in collaboration and creativity in higher education. Detailed studies on Chinese universities during the War of Resistance reveal the transformative power of migration; Hung (2023) argues that resettlement not only saved universities but also led to curriculum expansions in engineering, agriculture, and public health, maintaining education in harmony with national defense and postwar reconstruction work. Perry (2020) highlights how emigrating academics made collaboration and information exchange more possible, making research more efficient and the building of new academics' networks, which persisted far beyond the duration of the war. In addition, psychological and social effects of student and educator migration have been explored, in which Lee (2015) set out to establish that exercise contributed to sustaining resilience and amplified feelings of belongingness among those displaced.

n spite of great disruptions, students and teachers tended to report a greater sense of purpose and belonging, which ultimately enriched their educational experiences and institutional cohesion in times of crisis.

Educational Quality

Educational quality is the amount to which schools effectively teach, encourage critical thinking, and equip students to solve problems in accordance with individual and community needs. It includes educational setting, institutional resources, student support services, learning results, teacher effectiveness, and curriculum relevance. Different academic areas have studied educational quality extensively. The alignment of learning objectives, teaching techniques, and evaluation systems is fundamental to educational success, according to (Liu, 2023). They emphasize constructive alignment, which requires all aspects of education to work together to promote learning. Educational quality is typically examined in historical literature through social variables and pedagogical alignment. A new study highlights the complexity of educational quality throughout the War of Resistance Against Japanese Aggression.

Perry (2020) shows how the struggle forced institutions to change their trajectories to serve government goals. As schools emphasized practical skills throughout the war, educational programs became more important. However, research shows that this adaptation has major drawbacks. Academic quality and depth have sometimes declined due to a lack of experienced instructors, financial constraints, and the challenges of offering relevant education in a rapidly changing context. Quality and relevancy have been debated in modern writing. Studies also demonstrate that institutional support and leadership are necessary for educational quality during crises. Lee (2015) found that higher education institutions with comprehensive support systems for students and staff, including professional development, mental health services, and community engagement, were better at maintaining educational quality during wartime. This shows that academic curricula, institutional environment, and support methods affect educational quality.

National Defense Alignment

National defense alignment strategically aligns educational institutions, especially higher education, with national security interests. It aligns academic programs, research, and institutional resources with a nation's military sector aims and priorities. It discusses mobilizing intellectual resources for military and strategic purposes, creating national security curricula, and university-defense partnerships. During the War of Resistance Against Japanese Aggression (1931-1945),

Chinese colleges evolved to support the nation's military and address important issues (Lowry, 2024). Academics have long been captivated by education and national security. Early efforts, like Lee (2015), considered using education to support national security. This mobilization frequently involves implementing defensive technology research or enlisting educators and students in the military. National defense alignment stems from discussions regarding education's role in nation-building, especially during wartime. Chinese colleges improved national security through curricular changes and research during the War of Resistance (Henshaw, 2024).

Recent research on national defense alignment, notably during the War of Resistance Against Japanese Aggression, have improved our understanding. Universities strengthened national defense by aligning their courses with the government's urgent needs during the fight (Gardner, 2024). This collaboration encompasses defense-related research, student and staff participation in military activities, and military training. Research shows that colleges and government agencies collaborated to solve wartime problems.

Intellectual Independence

Intellectual independence refers to the ability of individuals or institutions to engage in critical analysis, creative thought, and knowledge generation without interference from government, commercial entities, or other external influences, and in higher education, it allows teachers and students to explore diverse perspectives, challenge prevailing paradigms, and develop innovative solutions to complex problems (Mulvey & Lee, 2024).

This is particularly crucial during periods of political or societal unrest when the independence of academic institutions is in jeopardy, for instance, during the War of Resistance Against Japanese Aggression (1931–1945), when Chinese universities struggled to keep up with outside pressures while trying to maintain intellectual independence. Later research has also emphasized intellectual independence across this period, as Suzuki (2021) demonstrates the manner in which Chinese institutions maintained independence by making use of networks of specialists and socially salient studies that enabled them to navigate ideological constraints and maintain academic standards. Liu's work shows that intellectuals then realized their obligations to society and the need for intellectual autonomy, which led many to study warfare and strategic defense so they could contribute to national security without compromising scholarly integrity, showing how universities can balance intellectual endeavor with national interest.

Regional Development

Regional development strengthens economic, social, and environmental systems, improving residents' lives. Infrastructure development, social justice, economic diversification, and environmental sustainability are included. Educational, infrastructural, healthcare, income, and employment factors determine regional growth. Higher education institutions' ability to solve regional challenges, stimulate innovation, and boost local economies affects regional development. Educational institutions changed to better serve their communities throughout the War of Resistance Against Japanese Aggression (1931-1945). Higher education and regional expansion were vital. Regional development research has dominated economic geography and development studies. In studying regional inequality, Myrdal (1957) and others focused on economic and social concerns. Myrdal's cumulative causation theory shows how initial advantages in some places can start a growth cycle that perpetuates inequality, emphasizing the necessity for focused development. Higher education institutions can boost local innovation and economic growth, according to education and regional development studies. Etzkowitz & Leydesdorff (1997)'s "triple helix" model promotes academics, business, and government in regional development. This paradigm states that universities may boost economic growth by studying local needs, cooperating with companies, and teaching residents.



Figure 1. Flow Diagram of Methodology

METHODOLOGY

This descriptive qualitative investigation studied the influence of the War of Resistance Against Japanese Aggression (1931-1945) on Chinese higher education institutions' resilience and development. The use of the descriptive methodology captures depth and variety in participants' experiences and learning, making it possible to develop rich, subtle history narrative. This methodology provides scholars with rich, detailed understanding of how individuals think about and understand the educational impacts of a significant historical event.

Qualitative interviewing was utilized to uncover individual and collective memories of higher education during the wartime to show how resilience and growth had been shaped. Semi-structured interviews were the primary method for data collection used, and the flexibility and scope of the study allowed participant inquiry. Through semi-structured interviewing, participants were able to voice their thoughts openly while providing feedback on research goals. The semi-structured approach urged respondents to discuss and provide relevant stories and commentary that structured questioning would not have generated. The historical context of the study necessitated this tactic since it was possible for the participants to contextualize their modern perspective on higher education in respect to past heritages (Figure 1).

This study recruited 17 participants with backgrounds in Chinese higher education during the War of Resistance, including historians, instructors, and researchers. Exclusion criteria removed individuals with minimal historical knowledge or direct wartime experiences to maintain a focus on historical narratives. Recruitment methods included academic networks, expert referrals, social media, and historical forums to ensure a diverse and knowledgeable sample. This approach facilitated broad outreach and engagement with qualified participants.

Table 2 presents the demographic profile of respondents. The respondent selection criteria were carefully designed to ensure a knowledgeable and relevant sample. Participants were required to have an interest in Chinese history, particularly the educational landscape during the War of Resistance, with backgrounds in academia, historical studies, or personal research. The exclusion criteria were implemented to maintain the study's focus on historical narratives rather than direct wartime experiences, which could introduce bias. The recruitment strategy combined academic referrals, social media outreach, and engagement in historical forums, ensuring a diverse and well-informed participant pool.

Table 2. Profile of Respondents

Respondent ID	Gender	Age	Occupation	Education Level	Relationship to Topic	Experience/Knowledge Source
R1	Male	65	Historian	PhD in History	Expert in Chinese education history	Academic research and publications
R2	Female	58	University Lecturer	Master's in Education	Focus on higher education policies	Academic experience
R3	Male	70	Retired Educator	Bachelor's in Arts	Taught during the post-war period	Personal teaching experience
R4	Female	50	Educational Researcher	PhD in Educational Studies	Research on wartime education	Scholarly articles
R5	Male	73	Historian	Master's in History	Specialized in modern Chinese history	Family accounts and archival research
R6	Female	65	Former Student	Bachelor's in Science	Attended university during wartime	Personal family stories
R7	Male	60	Cultural Critic	PhD in Cultural Studies	Analysis of education's role in society	Research and family narratives
R8	Female	55	Writer	Bachelor's in Literature	Focus on educational reforms	Historical research and writings
R9	Male	68	University Professor	PhD in Sociology	Studies on social impacts of education	Academic publications and teaching
R10	Female	62	Family Historian	Bachelor's in History	Documenting family experiences during the war	Oral histories from family members
R11	Male	67	Policy Analyst	Master's in Public Policy	Analysis of wartime policies on education	Government reports and research
R12	Female	54	Educational Consultant	Master's in Education	Consulted for wartime educational programs	Professional consulting and research
R13	Male	72	Archivist	Bachelor's in Archival Studies	Focus on educational archives during war	Archival work and historical documentation
R14	Female	61	Historian	PhD in History	Research on gender and education in wartime	Scholarly publications
R15	Male	66	Sociologist	PhD in Sociology	Studies on educational resilience	Research studies and publications
R16	Female	59	Journalist	Bachelor's in Journalism	Reporting on historical education	Interviews and historical analysis
R17	Male	64	Documentary Filmmaker	Master's in Film Studies	Documented stories of wartime education	Film projects and interviews

This qualitative study used semi-structured interviews with selected participants to gather their histories and opinions on Chinese higher education during the War of Resistance Against Japanese Aggression (1931-1945). The interviews sought open-ended responses to allow participants to express their opinions while guiding the discussion toward research goals.

An interview guide of open-ended questions was created to obtain participants' views on wartime higher education. The inquiries examined educational institution resilience, conflict education quality, and higher education's role in regional development. The interview guide also suggested additional in-depth discussions regarding participants' experiences or ancestors' stories. Table 3 shows interview protocol of the study.

Table 3. Interview Protocol

Variable	Interview Questions
Higher Education Resilience	1. How did Chinese higher education institutions demonstrate resilience during the War of Resistance?
	2. Can you provide examples of specific institutions or initiatives that adapted to the challenges posed by the war?
	3. In your opinion, what factors contributed to the resilience of these educational institutions?
University Relocation	1. How did the relocation of universities impact the educational landscape during the war?
	2. What were the challenges faced by relocated institutions in maintaining educational quality?
	3. Can you discuss any long-term effects of university relocations on higher education in China?
Educational Quality	1. How did the quality of education change during the War of Resistance?
	2. Were there specific subjects or disciplines that were more affected than others?
	3. What role did faculty and resources play in maintaining educational quality during the wartime period?
National Defense Alignment	1. How did higher education align with national defense efforts during the war?
	2. Can you provide examples of educational programs or curricula that were specifically designed to support the war?
	3. What impact did this alignment have on students and faculty?
Intellectual Independence	1. In what ways did the war influence the intellectual independence of higher education institutions?
	2. How did faculty and students navigate censorship or government influence during this time?
	3. Can you discuss any movements or initiatives that promoted intellectual independence during the war?
Regional Development	1. How did higher education contribute to regional development during the War of Resistance?
	2. Can you identify any specific regions that saw significant changes in educational initiatives due to the war?
	3. What long-term impacts on regional development can be traced back to the wartime education policies?

Interviews were conducted in various formats, including in-person meetings and video conferencing, depending on participants' geographical locations and availability. Each session lasted approximately 60 to 90 minutes, allowing ample time for participants to delve into their thoughts and share detailed accounts. All interviews were audio-recorded with participants' consent to accurately preserve their narratives for future research. The audio recordings were transcribed verbatim after each interview to allow data analysis while maintaining the participants' voices. Field notes from interviews, including contextual observations and nonverbal signals, were added to the transcripts to aid comprehension. Analyzing participants' stories was more comprehensive using transcripts and notes.

A three-step thematic analysis technique by Clarke & Braun (2017) was used to analyze the data. The selection of the three-step thematic analysis by Clarke & Braun (2017) was motivated by its systematic method of finding and interpreting patterns in qualitative data. The approach permits a structured but adaptable analysis, which is particularly appropriate for historical research. Data familiarization started the coding process, where transcripts were read and reread, and initial thoughts were recorded. In the second step, open coding was used to pull out significant segments from the transcripts. For example, mentions of "wartime educational adaptation" were coded under more encompassing themes such as "institutional resilience." The last step was to work on these codes to turn them into overarching themes, making them coherent and in-depth in nature (Braun & Clarke, 2019) (Figure 2).

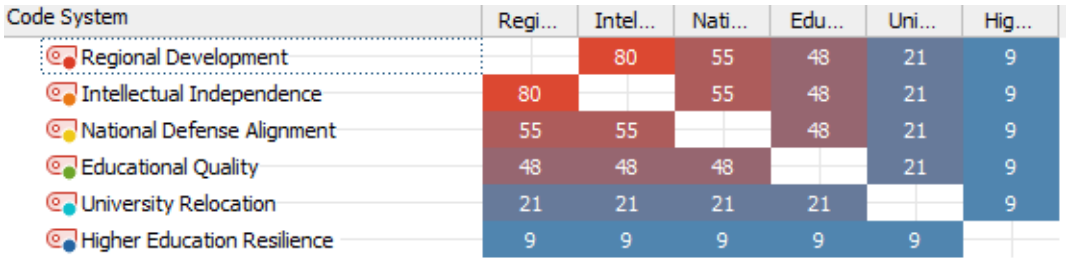


Figure 2. Code Relation Browser

The researcher identified relevant data items, annotated them, and used descriptive labels to summarize the participants' results. The researcher iteratively reviewed transcripts as new codes emerged and refined current codes to reflect patterns. The goal was to create a complete set of codes that accurately showed the data and emphasized the main study issues. In the third step, the researcher categorized the original codes into themes to summarize the study. This included organizing related codes into themes that captured participants' experiences and opinions (Figure 3). Critical analysis of the classified data revealed themes by examining the intricacy of individual stories and the overall trends from the interviews. The themes were tweaked to match the data and the study's goals. The researcher used reflexivity by reflecting on their preferences and biases during the investigation. Reflexivity was essential to ensure that the analysis was based on participants' voices and experiences, not the researcher's theories.

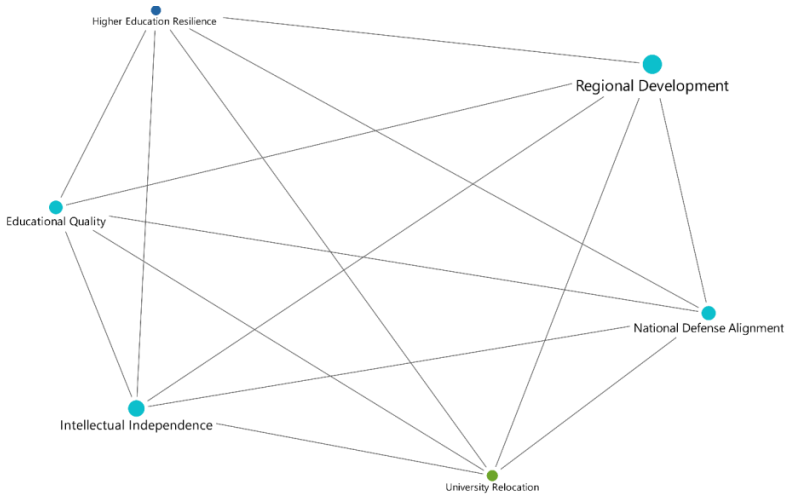


Figure 3. Code Map

Findings

Chinese higher education institutions flourished throughout the War of Resistance Against Japanese Aggression (1931-1945) to promote national survival and attain regional aims. Thematic analysis of 17 semi-structured interviews with historical specialists revealed these organizations' endurance, intellectual independence, relocation, alignment with national security, and regional development function. Institutions' role in defining China's higher education environment during and after the war was highlighted, as were the obstacles and creative solutions used during warfare. Each issue analyzes how higher education institutions meet social and national needs under difficult situations. landscape during and after the war was underscored, as were the challenges and workarounds employed in wartime. Every issue examines how higher education institutions serve social and national interests under challenging circumstances. Table 4 outlines dominant themes and sub-themes based on the research, highlighting the multi-faceted influence of the War of Resistance Against Japanese Aggression on higher education. It depicts how universities showed resilience through institutional adjustment, student mobilization, and management of resources in the face of relocation and academic continuity challenges. The table also highlights the alignment of education with national defense, intellectual independence struggles, and the contribution of universities to regional development. These findings all highlight the long-term impact of wartime education policy on postwar academic and socio-economic frameworks.

Table 4. Themes and Sub-themes

Theme	Sub-theme
1. Resilience of Higher Education Institutions	1.1: Institutional Adaptation
	1.2: Student Engagement and Participation
	1.3: Resource Management
2. Impact of University Relocation	2.1: Displacement Effects
	2.2: Changes in Academic Offerings
	2.3: Community Engagement
3. Educational Quality During the War	3.1: Variability in Educational Standards
	3.2: Subject-specific Changes
	3.3: Student Experience
4. Alignment with National Defense	4.1: Integration of National Defense Themes in Curricula
	4.2: Collaboration with Military Entities
	4.3: Broader Societal Implications
5. Intellectual Independence	5.1: Challenges to Academic Freedom
	5.2: Emergence of Alternative Intellectual Discourses
	5.3: Resilience of Scholars and Students
6. Role in Regional Development	6.1: Education and Regional Development
	6.2: Provision of Vocational Training
	6.3: Long-term Impact on Local Economies and Societies

Theme 1.1: Resilience of Higher Education Institutions: Semi-structured interviews illuminated higher education institutions' resilience throughout the War of Resistance Against Japanese Aggression. These institutions' flexible methods, community support, and excellent resource management ensured educational continuity during this turbulent time, participants said.

Sub-theme 1.1: Adaptive Strategies: Higher education institutions used inventive methods to handle wartime challenges, according to respondents. Many schools focused on practical, relevant courses that addressed social issues. R2 said "We were necessitated to adjust swiftly during the conflict." We prioritized agricultural and military training for the nation. R6 said, "The university was not solely an institution for education; it was converted into a training facility for the war effort." We were driven to solve problems and innovate. Also, many responders stressed teaching technique flexibility.

R5 said scholars must be more creative. They sometimes taught outside or in impromptu classrooms with available supplies. This adaptation allowed education to survive the fighting's physical and logistical hurdles.

Sub-theme 1.2: Community Support:Local support has helped higher education institutions survive. Institutions and communities collaborated to foster solidarity, according to respondents. Communities supported schools: "Individuals contributed resources, organized food drives, and offered shelter for students." Collective action was necessary for survival. R3 said "I recall the townspeople accommodating displaced students and faculty in their residences." Aid strengthened our resilience and connection. This community engagement prioritized education and social well-being with institutional aid.

Sub-theme 1.3: Resource Management: Participants said resilient behavior required effective resource management. Institutions must prioritize vital demands owing to limited resources. R9 said, "We must be exceptionally resourceful." We persisted despite severe supply shortages at certain colleges. In this age, respondents believed institutions used distinct fundraising techniques. R11 says: "Universities requested assistance from alumni and local businesses." Fundraising was vital to starting. Despite their limits, these proactive resource management measures show the institutions' commitment to education. "Institutions routinely exchanged faculty and pooled their resources." R10 stressed academic collaboration. Our pragmatic approach maintains educational quality regardless of situations. University survival throughout the War of Resistance Against Japanese Aggression illustrates a diversified approach to problem-solving. Adaptable curriculum, teaching approaches, and resource management kept education functioning throughout this tough period. Despite limits, responses indicate a sincere dedication to education and Chinese higher education's inventive culture, proving the war's huge influence on institutional survival.

Theme 2: Impact of University Relocation: Semi-structured interviews exposed university relocation's consequences during the War of Resistance Against Japanese Aggression. Respondents discussed relocated institutions' problems, educational offers, and long-term effects.

Sub-theme 2.1: Challenges of Relocation: Institutional relocation produced logistical and operational issues. Responders described their shift problems. R3 said, "Everything was disorganized during our relocation." We lost many supplies, and numerous students and staff had to flee their homes. R7 said, "The endeavor of identifying appropriate space for classrooms and dormitories was substantial." Many people had to learn in improvised classrooms, which was poor (R7). Significant impact on student enrollment. R5 said "The ambiguity of the situation dissuaded numerous students from pursuing their education." Some enroll in the military, while others cannot handle the tumult (R5). Due to low enrollment, institutions received less funding and aid.

Sub-theme 2.2: Changes in Educational Offerings:Participants reported that institution migration changed instructional programs significantly. Courses were modified during the conflict to reflect changing situations. R8 said, "The war necessitated a focus on practical skills." We taught military science, engineering, and agriculture to prepare pupils for future difficulties. This pragmatic change kept institutions relevant during national turmoil. The focus on fundamental needs hurt some specializations, R6 said. This age repressed humanities and social sciences. "Resources were redirected to subjects that could directly support the war effort," R6 said. This tendency affected education quality and students' subject perspectives.

Sub-theme 2.3: Long-term Consequences:As respondents considered the period's effects, university relocations' long-term effects became clear. Migration changed many institutions' identities: "Many universities that relocated were never quite the same." They lost some historical importance and status, requiring years of rehabilitation (R10). R9 also noted how displacement affected postwar educational policies. "The conflict and ensuing displacements profoundly transformed the higher education landscape in China." It started a conversation about flexible, mobile, and disaster-ready schools, according to R9. The essay discusses China's higher education potential and wartime repercussions. Respondents acknowledged their perseverance from these trials. R11 says "Despite the adversities, the experience imparted the significance of adaptability and resourcefulness." These notions remain relevant (R11). A complex combination of obstacles and adaptations results from university relocation during the War of Resistance Against Japanese Aggression. Despite logistical issues and instructional emphasis shifts, institutions gained purpose and resilience. These displacements have changed not only specific institutions but overall China's higher education system, demonstrating the negative effects of war on educational systems.

Theme 3: Educational Quality During the War: The examination of educational quality during the War of Resistance Against Japanese Aggression revealed how wartime situations affected instruction efficacy and methods. Participants noted educational disparities, local challenges, and the impact on the student experience.

Sub-theme 3.1: Variability in Educational Standards:Participants reported significant educational quality differences between urban and rural locations, notably within institutions. So, "Universities in metropolitan areas were able to sustain a certain level of quality due to superior access to resources, whereas those in rural regions faced significant challenges" (R5). This disparity showed wartime educational disparities. R4 stated, "Many professors were conscripted or departed for safety." This caused undertrained teachers, lowering training quality (R4). The loss in staff experience lowered instructional quality, increasing unhappiness among eager students.

Sub-theme 3.2: Subject-specific Changes:The conflict shifted attention to national needs. Multiple fields showed large declines throughout this decade. R2 said "The quantity of humanities courses was markedly reduced." We had to prioritize wartime skills, which left many of us unprepared for academics (R2). Practical classes trimmed a full education, leaving students uninformed. R8 said, "We were necessitated to abbreviate our science curricula to meet the exigencies of wartime." We had to address urgent concerns quickly, sacrificing depth for expediency (R8), making the work difficult. Due to circumstances, teachers had to forego quality and thoroughness.

Sub-theme 3.3: Student Experience: Respondents considered how their education affected their entire student experience during the debate. Many expressed dissatisfactions with their schools. R3 said "The persistent threat of

violence and the scarcity of resources hindered our ability to concentrate on our studies. “We existed in a state of anxiety." (R3). Ambiguity hindered learning and student engagement. R9 also stressed the psychological impact of conflict on students, saying, "We were not merely students; we were observers of a national catastrophe." Stress prevented us from focusing on other issues "(R9). Emotional stress affected pupils' academic performance and motivation, hurting their education. However, other respondents said the difficulties fostered student togetherness. R10 said "We identified methods to support each other despite numerous challenges." Student groups offered a secure space for problem-solving and learning (R10). This camaraderie showed students' resilience and adaptability. Students and institutions struggled during the War of Resistance Against Japanese Aggression, as seen by educational quality. Education, topic matter, and student experiences were altered by wartime situations. Student dedication and solidarity during wartime instability dramatically improved education despite numerous negative repercussions.

Theme 4: Alignment with National Defense: Educational policies and procedures were changed to help the War of Resistance Against Japanese Aggression in higher education and national defense. Participants stressed the alignment's social effects, military engagement, and national security curriculum.

Sub-theme 4.1: Integration of National Defense Themes in Curricula: Wartime respondents stressed the necessity to incorporate national security into the curriculum. R6 says: "Curricula were restructured to include subjects such as military science and national defense strategies." Students needed the skills to complete tasks amid disagreement (R6). Integration made education relevant and connected with national objectives. It also noted that "universities held lectures and seminars focused on patriotic education, emphasizing the importance of national unity and resilience" (R11). These programs promoted national engagement and student responsibility.

Sub-theme 4.2: Collaboration with Military Entities: The increased cooperation between military units and educational institutions showed the link to national defense. Participants discussed their military and educational preparedness collaborations. R4 said "The military and various institutions cooperated to create specialized training programs." We used military resources and experience (R4). This partnership helped military personnel and students share information and skills. The partnership increased student engagement, according to R8: "Military professionals taught pupils actual defense capabilities. It made our fighting training more practical "(R8). Military expertise in academia bridged theory and practice.

Sub-theme 4.3: Broader Societal Implications: The higher education-national security link had major socioeconomic effects. Participants said this approach helped kids build a national identity. R10 said "The focus on national defense imparted a deep sense of purpose within us." "We perceived ourselves as integral to a greater entity" (R10). This sense of connection and loyalty to the national cause fostered friendship beyond individual interests. R7 cautioned against this linkage, saying, "National security was vital, but it often overshadowed other schooling issues. “We risked compromising our objectivity" (R7). This perspective shows the disconnect between national goals and holistic education. Higher education's role in national security during the War of Resistance Against Japanese Aggression shows a smart response to wartime challenges. National security issues in the curriculum, military cooperation, and the societal effects of this alignment demonstrate the relevance of education to the national agenda. This emphasis fostered student solidarity and purpose, but it also raised questions about the balance between national goals and holistic education, which would impact Chinese higher education.

Theme 5: Intellectual Independence: Understanding intellectual autonomy throughout the War of Resistance Against Japanese Aggression showed how universities preserved academic integrity. Participants recognized academic independence, intellectual discourses, and student and teacher goals for autonomous thought.

Sub-theme 5.1: Challenges to Academic Freedom: Participants claimed higher education institutions struggled to retain academic autonomy throughout the crisis. Political conflict and violence can inhibit intellectual progress. R2 said "The political climate impeded our ability to investigate specific themes." Teaching and research need caution (R2). This climate hampered academic debate and analysis. R9 said "Censorship was a widespread occurrence among professors." Due of reprisal, subversive or anti-war emotions were difficult to express (R9). This limited pupils' exposure to other ideas and shaped the curriculum and academic atmosphere.

Sub-theme 5.2: Emergence of Alternative Intellectual Discourses: Despite these limitations, many respondents considered alternative intellectual discourses as a tool to resist influences. R8 adds "We commenced an investigation into alternative paradigms of thought in reaction to the limitations." "A sense of urgency existed in the reclamation of our intellectual freedom" (R8). IP freedom inspired academics and students to experiment and create. R5 investigated how subterranean networks propagate alternative ideas: "We formed study groups that functioned autonomously from conventional academic structures." This connected us to ignored ideas and ideals. These networks gave academic freedom-loving students and academics intellectual autonomy and companionship.

Sub-theme 5.3: Resilience of Scholars and Students:Researchers and students needed intellectual autonomy. Wartime education emphasized autonomous inquiry and critical thinking. R10 noted resilience, "We developed the capacity for critical thinking and the ability to interrogate the narratives presented to us." We needed this expertise to survive. Students felt empowered throughout school by critically interacting with topics. Intellectual freedom was also highlighted by R11: "The conflict taught me to raise challenging questions. Mild resistance to the status quo was liberating "(R11). This inquisitiveness, fostered by difficulties, demonstrated higher education's requirement for intellectual autonomy.

Analysis of intellectual independence during the War of Resistance Against Japanese Aggression reveals a complex relationship between resilience and higher education issues. Despite academic freedom, alternative intellectual discourses and student and faculty resistance showed a dedication to independent thinking. These events substantially affected Chinese higher education and intellectual freedom consciousness throughout national struggle.

Theme 6: Role in Regional Development ;Higher education institutions' contributions to regional development

during the War of Resistance Against Japanese Aggression showed how they adapted to local demands while benefiting society. The participants evaluated the long-term consequences of institutions on local economies and society, vocational training, and education and regional growth.

Sub-theme 6.1: Education and Regional Development: Respondents said institutions helped local residents during the crisis by addressing their concerns. R7 says "Our university assumed a leadership position in the region, coordinating initiatives to assist local farmers and businesses impacted by the war" (R7). The institution's support for the community during difficult times showed its regional development commitment. R4 stressed that "Education was not solely the transmission of knowledge; it also involved the application of knowledge to practical issues." We kept the local economy alive by participating in community events (R4). Aligning educational aims with community needs shows how higher education promotes regional growth and resilience.

Sub-theme 6.2: Provision of Vocational Training: Higher education institutions' regional development strategies now include vocational training. Participants stressed the need of giving pupils conflict resolution tools. R9 stated, "We instituted pragmatic courses to enable students to get skills that were directly useful in the industry." This was vital to our community's survival. This focus on vocational training showed how educational systems may adjust to shifting socioeconomic conditions. Also, "By offering training in fields such as agriculture, mechanics, and healthcare, we successfully developed a workforce equipped to meet the urgent demands of our region during the war" (R8). This approach empowered children, built resilience, and boosted the local economy.

Sub-theme 6.3: Long-term Impact on Local Economies and Societies: Respondents typically noted higher education's long-term benefits on local economy and society. They remarked that wartime efforts aided advancement. R3 claims that wartime relationships with local industries and communities lasted long after the war. The institution has become a regional development player. This long-term partnership between schools and local groups showed the benefits of wartime teamwork. R10 said, "Post-war, a considerable contingent of graduates emerged as community leaders, applying the skills and knowledge gained during their education to foster regional development" (R10). This conclusion stressed higher education's ability to change society and people. The War of Resistance Against Japanese Aggression research shows how higher education institutions helped local communities in many ways. Long-term cooperation, professional training, and higher education helped address regional concerns and build resilience. These experiences and initiatives provide the framework for future progress, demonstrating the importance of higher education in regional economic and social development.

DISCUSSION

This study identifies the salient contribution of higher education toward constructing national and regional identities amidst the War of Resistance Against Japanese Aggression (1931-1945). It investigates the role played by universities in stimulating regional development, adaptability, relocation tactics, academic excellence, intellectual freedom, and national safety throughout this dynamic period. The research aims to highlight the flexibility and resilience of institutions of higher learning in coping with wartime crises, as well as to unveil the lasting impacts of the war on higher education policy in China.

One of the overarching themes from this research is the resilience of universities in the midst of war-related adversity. Interviewees stressed that universities proactively worked to survive and function in spite of the war. Most institutions had modified their curriculum to meet the needs of national security, showcasing their dedication to supporting government initiatives. The long-term impact of this adjustment influenced postwar higher education policy, resulting in the incorporation of national security issues and patriotic education into university courses. Previous research on educational resilience indicates that institutions react to outside limitations by transforming adversity into opportunities for development and applicability. The interviews upheld that education had a central part in building social resilience, since the participants acknowledged gratitude for the wartime assistance of their institutions and educational programs. The resilience theme also indicates emotional and psychological resilience of students and teachers. The participants narrated how teachers and students collaborated in upholding an academic atmosphere amid adversity. This cooperative strategy is similar to other past examples in which schools offered stability and hope in times of national crisis.

The second of these themes, the effect of university migration, discusses how migration offered opportunities and challenges for institutions. Several respondents commented that forced relocations interfered with academic continuity and resource access. However, migration also compelled universities to reexamine operating strategies. The long-term effect of these war-time displacements was the decentralization of Chinese higher education, as campuses established branch facilities and new learning centers in less-affected regions, many of which continued to operate after the war. Previous studies on educational resilience highlight how institutions react to operating and geographical constraints. The migration induced by the war led to innovation, as institutions were compelled to develop new pedagogical and outreach strategies. However, relocation also had profound psychological effects, as students and teachers suffered from emotional trauma due to displacement.

This study also investigates the efforts of institutions of higher learning to maintain academic quality during war. The respondents described how financial constraints, disruption of the academic calendar, and changes in curricular focus affected the quality of education. Despite these setbacks, innovative strategies were implemented to maintain academic integrity. Educators utilized non-formal settings and community-based materials to enhance learning. This period emphasized the importance of educational flexibility in shaping postwar higher education policies, which culminated in the institutionalization of flexible learning environments and interdisciplinarity. Resilience studies of education show that institutions rely on creativity and local resources to endure adversity. Participants emphasized equipping students with the capacity for postwar reconstruction through the promotion of critical thinking and inquiry-based learning. Even in restraint, teachers made efforts to produce an intellectual setting that fostered curiosity and debate.

The fourth, alignment with national defense, describes how the universities played roles in military pursuits in the war. Nationalism, patriotic education, and military education were embedded into the university curriculum, validating the national security agenda. Wartime educational ideology carried through in post-war university curriculum in the sense that political ideology found strong roots within Chinese higher education and impacted the autonomy of faculties as well as students. Nation-building literature indicates that education was crucial in the propagation of national ideology and collective identity. Respondents in this research considered how universities made students feel a sense of national responsibility, placing intellectual communities to the side of the war effort. But this tight connection between academia and national security was at the expense of intellectual autonomy. Respondents complained about stifling dissent and limiting academic freedom (Perez Mena, 2024). The long-term effect of this ideological convergence was the perpetuation of state control over university administration, impacting the autonomy of faculty and ideologically shaping higher education policy orientation.

The phrase "struggle for intellectual autonomy" appears as a motif in historical accounts of wartime education. All the participants in this research recalled struggling to reconcile intellectual curiosity with national responsibilities, but wartime constraints curtailed academic freedom. However, some academics attempted to maintain academic standards and student agency. The war's impact on academic autonomy continued into postwar China as ideological domination of universities continued to influence research priorities and teaching practices. Past studies indicate that universities have an important role in promoting critical thinking and diversity, especially during periods of social turmoil. The implications of this study are consistent with wider discussions of the role of universities in mediating political pressure while upholding academic standards (Lowry, 2024). The last theme, the role of universities in regional development, brings out how the universities played an active role in contributing to local communities during wartime. Interviewees confirmed that several universities put into place vocational training schemes to give local communities skills to recover from the war. Postwar education policy, shaped by this wartime focus on community involvement, encouraged university-community collaborations and regional economic programs. Institutions also cooperated with the local industries and businesses, and funded agricultural training and infrastructure building (Chang, 2021). The cooperation not only served the interests of the local communities but also allowed students to experience learning from practical situations, thus reinforcing the extended role of higher education beyond classroom environments. The emphasis on regional development corroborates the literature on universities as agents of economic and social change. Compared to other nations devastated by the war, such as the United Kingdom and the Soviet Union, other nations also had universities play a significant role in regional reconstruction, with vocational training and labor development being included in postwar education policy. This cross-national comparison demonstrates the overall function of higher education institutions in national reconstruction following wartime dislocation.

A comparative method adds depth to our understanding of how tertiary education systems responded to crises of war throughout the world. For example, in Britain in World War II, universities acted by focusing on scientific research in the interests of national security, as Chinese universities did during the War of Resistance Against Japanese Aggression. Similarly, Soviet universities during World War II were heavily involved in state-sponsored war efforts, and their post-war educational policy carried a very strong taste of ideological training and technical education. These examples serve to illustrate the general trends in wartime education wherein universities follow national agendas but at the cost of intellectual freedom.

This study provides us with significant information regarding how the War of Resistance Against Japanese Aggression shaped Chinese higher education. The Changes brought about by the war impacted post-war higher education policy, intensified national security problems, regional involvement, and ideological control in universities (Alitto, 2023). The continuous integration of ideological education into Chinese universities, decentralization of universities, and the long-term impact on faculty autonomy are all indicative of the long-lasting legacy of this war experience. Universities were proved to be resourceful, adaptable, and able to shape national identity and collective memory. Through its analysis of how educational resilience interacted with regional development and national security, this research adds to the broader understanding of how universities perform during periods of crisis. What happened at Chinese universities between these years provides a valuable lesson for today's debates regarding the social resilience, ideological power, and postwar reconstruction functions of higher education.

Implications

This study has significant theoretical implications for crisis-stricken higher education institutions, stressing the necessity of resilience and accommodation in times of uncertainty. Through an investigation of how higher education leaders and educators responded to the War of Resistance Against Japanese Aggression, the study departs from the conventional view of higher education as solely cerebral and instead proposes its essential engagement with national identity and nation-building. The findings show that universities are not only centers for learning; they become pillars of political authority and social cohesiveness during times of crisis. Analyzing the intersection between education and socio-political movements allows researchers to analyze how institutions navigate nationalist pressures while maintaining their core academic responsibilities. Moreover, the study sheds light on intellectual freedom in academia, demonstrating how members of staff made an effort to uphold academic honesty in the face of external ideological pressures. Their efforts underscore the importance of having an environment welcoming to divergent opinions, particularly in challenging political climates. These findings set the stage for further investigation into how contemporary universities around the world manage academic freedom and socio-political pressure, particularly in regions that face geopolitical tensions or changes in ideology.

In addition to its theoretical contributions, the study offers practical implications to the contribution of higher education to regional development and national security, particularly in the recovery process from war. The study highlights how universities can contribute directly to socioeconomic reconstruction through increased engagement with the community,

encouragement of vocational training, and coordination of academic programs with regional needs. This perspective provides valuable guidance to both policymakers and educators, calling for them to envision colleges as instruments of social change and not independent schools. Through putting great emphasis on community engagement and aligning courses with national purposes, institutions of higher education can enhance both their relevance and their enduring influence. More importantly, the research analysis of national security alignment demonstrates how education can shape crisis response planning. By integrating national defense subjects into the curriculum without sacrificing academic integrity, universities can prepare students to address pressing global challenges.

This information is particularly useful for educational leaders developing interdisciplinary programs that address national needs in addition to intellectual curiosity. In summary, the research points out that universities need to adopt an inclusive approach that goes beyond intellectual excellence to include resilience, intellectual independence, and local development in an effort to be viable agents of national progress in a world that is increasingly complex.

Limitations and Future Directions

This study provides valuable insights into the role of higher education institutions during the War of Resistance Against Japanese Aggression, highlighting their contributions to national identity, resilience, and socio-political stability. However, the findings may have limited generalizability due to the historical specificity of China's wartime experience, which was shaped by unique sociopolitical factors such as foreign occupation and nationalism.

Collecting data through semi-structured interviews as the main source provides in-depth qualitative information but is also essential to introduce subjectivity, as the views of the respondents cannot be fully representative for all higher education stakeholders across time. Subsequent studies should involve a combination of interviews, quantitative questionnaires, and historical records to get a more complete view of the long-term consequences of wartime adjustments on educational institutions. Moreover, although the research is centered on academic leaders and teachers, it does not consider the voices of students, local communities, and governments, whose experiences throughout the war were pivotal in influencing the development of higher education. Student motivations, their response to institutional reforms, and their expectations during conflict would provide a more comprehensive view of the role of higher education in crisis. The report further prioritizes linking more education to national security and regional development but continues to overlook the long-term implications of wartime innovations on postwar education. Examining how universities' war-driven transformations impacted their postwar trajectories, institutional self-perceptions, and policy agendas may better reveal the long-term implications of educational resilience in crises.

Moreover, the study is also beset by the conflict between nationalism and academic freedom, a pertinent issue that emerges from historical backgrounds and into educational contexts of today. With changing political weather and ideological conformity pressures in various regions of the globe, understanding the historical struggle of universities to maintain intellectual freedom can enlighten contemporary discussions on academic freedom.

Future research will require examination of the ways that current academic institutions confront outside influences and preserve their positions as loci of critical discourse and social advance. Comparing conclusions reached based on experiences of the past to today's dilemmas allows scholars to more accurately assess higher education's capacity for promoting resilience, flexibility, and intellectual autonomy within more stormy geopolitics.

CONCLUSION

During the War of Resistance Against Japanese Aggression, higher education institutions demonstrated resilience, adaptability, and social responsibility, playing a crucial role in sustaining national progress and fostering regional development amid crisis. This study identifies six key themes: higher education resilience, university relocation, educational quality during conflict, intellectual autonomy, national security alignment, and regional growth, highlighting how these institutions not only survived but actively contributed to societal stability. Strategic migration by the universities exemplified their ability to adapt within a changing context and reaffirm linkage with host communities and industry to foster constant learning and national advancement. Moreover, aligning programs with national defense initiatives pointed toward the institution's role in the preparation of citizens with a survival level of competency, assisting their broader role within society over intellectual objectives. The study also highlights the challenges that students and teachers face in preserving intellectual integrity under political oppression, as respondents value diversity, critical thinking, and intellectual freedom despite oppression - a basic requirement of higher education and active citizenship. Further, the role of universities in local development was discovered as they reacted to local socioeconomic challenges, initiated community programs, and carried out postwar reconstruction through education-oriented activities. This research underscores that the significance of higher education extends beyond academia; it serves as a crucial mechanism for addressing societal issues, fostering national identity, and promoting economic resilience. The experiences of wartime educational institutions demonstrate how education can be a powerful tool for overcoming adversity, reinforcing the long-term impact of higher education on social cohesion, identity formation, and national stability.

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TRANSPORT AS A FACTOR IN THE DEVELOPMENT OF RURAL TOURISM IN AKTOBE REGION, REPUBLIC OF KAZAKHSTAN

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Abstract: Transport provision is a basic condition for the development of tourism, and in accordance with the country's development plans, tourism has been recognized as one of the priorities of economic development, including the development of rural areas. In the context of growing competition for tourists and taking into account the presence of tourist attractions and developed tourist infrastructure, the transport accessibility of the regions is becoming increasingly important. Despite the obvious importance of transport for all sectors of the economy, including tourism, if we take into account the size of the country, transport conditions for the development of tourism in Kazakhstan, especially rural tourism, have relatively little reflection in research topics, which was confirmed by literature studies on this topic. Therefore, the aim of the research undertaken is to analyze the spatial differentiation of the conditions for the development of tourism in Aktobezhsk Oblast in relation to the location of tourist attractions and transport accessibility. The research material includes data collected on the basis of field studies conducted in 2023-2024. Statistical data on transport in Aktobezhsk Oblast and its districts come from the Akimat of Aktobezhsk Oblast from the Department of Passenger Transport and Roads of Aktobezhsk Oblast. All factual material was verified and supplemented during field research. Using the developed criteria, an assessment of the accessibility of districts of Aktobe region, which have the potential for the development of rural tourism, not only domestic but also international, was carried out. The transport potential of Aktobe region is significant due to its size and geographical location. The region is served by rail, road, air and pipeline means of transport. However, the quality and density of transport infrastructure remain underdeveloped. The underdevelopment of the transport network, as shown by statistical analyses of road, railway and air infrastructure, strongly confirms the hypothesis that the current transport system, despite the abundance of natural resources, actually limits the tourist accessibility of Aktobe region. Similarly, the conducted classification of the number of tourist attractions in the Aktobe region, the ranking of counties and the transport accessibility of tourist attractions. In summary, transport infrastructure plays a key role in the development of rural tourism in Aktobe region. Improving the road network and improving the accessibility of remote areas will help to balance tourist flows and increase the economic impact of rural tourism development.

Keywords: agritourism, Aktobe region, rural tourism, tourist attractions, tourism, transport, transport accessibility

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INTRODUCTION

Tourism in Kazakhstan was becoming more and more popular, which resulted in the interest of numerous researchers (Kantarci, 2007a; 2007b; Smykova, 2015; Tleubayeva, 2019a; Wendt, 2020). Due to its importance, numerous studies were conducted in Kazakhstan, but most of them concerned mountain regions located in the south and south-east of the country (Ziyadin & Takhtaeva, 2014; Chernova & Sukhova, 2017; Aliyeva et al., 2019; Chlachula, 2019; Issakov et al., 2025; Artemyev et al., 2025). However, according to the government's decision (Zhidkoblinova, 2013; State Program for the Development of the Tourism Industry, 2019; Concept for the Development of the Tourism Industry, 2023), tourism is to constitute a rapidly growing sector of the economy (Abubakirova et al., 2016), both at the national and regional level (Aktymbayeva et al., 2020; Kenzhebekov et al., 2021; Tleuberdinova et al., 2022; Makhanova et al., 2022; Dłużewska et al., 2022; Seidualin et al., 2025), as well as rural tourism (Tleubayeva, 2019a; Pashkov, 2021; Wendt et al., 2021a; Saparov et al., 2024).

The Aktobe region was chosen as the object of the study. Aktobe region is one of the most prosperous regions of the Republic of Kazakhstan, with huge economic, cultural and tourist potential. Aktobe region is located in the northwestern part of the republic and borders six regions of the Republic, as well as the Orenburg Region of the Russian Federation in the north and the Karakalpak Autonomous Region of the Republic of Uzbekistan in the south. It is the second largest region in terms of territory (after Karaganda) – 300.6 thousand square kilometers, which is 11% of the state's territory. The average population density in the region is 3.12 people per 1 sq.km. of the territory of the state. Aktobe region has 12 regions (Table 1), each of which has unique potential in terms of tourist attractiveness (Sergeyeva et al., 2021;

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Berdenov et al., 2021; 2023; Khamit et al., 2024; Yakupova et al., 2024).The sphere of rural tourism in Aktobe region is in positive dynamics, the image of the region as an attractive territory for rural tourism is formed.

Table 1. Districts of Aktobe region (Source: Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, 2025)

Administrative unit	Population	Area km^2	Population /km^2	Rural area %	Rural pop. %	Rural pop. /area
1. Baiganin district	22 940	60 200	0.38	100.0	100.0	0.38
2. Uil district	16 088	11 200	1.44	100.0	100.0	1.44
3. Khobda district	15 974	14 000	1.14	100.0	100.0	1.14
4. Martuk district	29 717	6 500	4.57	100.0	100.0	4.57
5. Kargaly district	15 433	5 000	3.09	100.0	100.0	3.09
6. Hromtau district	46 597	12 800	3.64	99.8	35.0	1.20
7. Alga district	43 714	7 300	5.99	99.1	47.8	2.80
8. Mugalzhar district	65 738	29 500	2.23	99.9	24.1	0.50
9. Aitekebi district	20 632	36 800	0.56	100.0	100.0	0.56
10. Irgyz district	13 929	41 500	0.34	100.0	100.0	0.34
11. Shalkar district	42 362	61 000	0.69	99.9	34.0	0.20
12. Temir district	35 761	12 500	2.86	99.8	93.8	2.60
13. Aktobe city	570 475	2 300	248.03	0	0	0
14. Aktobe region	939 360	300 600	3.12	98.7	74.9	0.78

As of January 1, 2025, the population of the Aktobe region totaled 939.6 thousand people (Table 1), including 703.6 thousand urban residents (74.9%) and 235.9 thousand rural residents (25.1%). As we can see from the table, most of the territory of the Aktobe region consists of rural areas. The region has a total of 8 cities (Aktobe, Alga, Zhem, Kandyagash, Temir, Khromtau, Shalkar, Emba). The advantage of the region is that it has an advantageous geographical location, being at the junction of Europe and Asia. Caravans of the Great Silk Road passed through this land, connecting cities and countries. The modern map of the region is crisscrossed by highway lines, the largest of which is the global transport corridor "Western Europe – Western China".

Railway lines stretch in all directions, both to the European and Asian parts of the Eurasian continent. The sky is covered by a network of international air routes. Almost all airlines in the world use the services of a state-of-the-art, regional air navigation control center. A modern international airport can receive aircraft of all types.

The aim of the study is to analyze the spatial differentiation of tourism development conditions in the Aktobe region in relation to the localization of touristic values and transport accessibility. The analysis of the spatial differentiation of tourist attractions in relation to the transport network will allow for the indication of (1) areas with difficult transport access to tourist attractions; (2) the indication of directions of necessary transport investments that may lead to an increase in the volume of tourist traffic, especially in the field of rural tourism. The hypothesis verified in the research is the poor development of the road network, which is characterized by too low density. Which is a barrier to the development of rural tourism.

LITERATURE REVIEW

One of the directions of development of the tourism sector, which is aimed at protecting and developing nature, cultural and historical heritage, attracting people to actively participate in solving their own financial problems, and promoting the employment of the unemployed, is the development of rural tourism. Rural tourism pursues the main goal - to form a new agro touristic product that goes beyond the traditional idea of the tourist offer, and which would consider the natural, historical and cultural specifics of the regions, as well as significantly diversify the traditional offer, which will be of the greatest interest in terms of attracting quite demanding foreign tourists.

World practice testifies to the most important role of tourism, based on the use of elements of the history of folk life, both in terms of generating income and providing conditions for recreating a natural viable historical environment (Hartman, 2023; Moldagaliyeva et al., 2024). Therefore, the cultural and folk-ethnographic aspect are the basis for the development of rural tourism (Deac et al., 2023; Mukatova et al., 2024). The development of rural tourism, which today is considered as a form of recreation for the urban population and as a form of activity of peasants who provide housing and food for vacationers, is a very important resource for the state. The basics of studying rural tourism were considered in foreign literature (Lane, 1994; Garrod, 2006; Wendt, 2020; Rosalina, 2023; Waleghwa, 2025). One of the most valuable competitive advantages of rural areas over urban ones is that they harmoniously combine rural and cultural values in the form of a special harmony of attractions (Trukhachev, 2015; Kadyrbekova et al., 2024).

In recent decades, the development of rural tourism has been growing in developed countries (and more recently in developing countries). The research results of various researchers indicate that the volume of tourist flow to rural areas depends on its territorial location (Mikhaylova et al., 2022; Firstianto et al., 2024; Chin et al., 2025), which means that it is also associated with the effectiveness of providing this complex of information about the material and spiritual culture of the population living in it (Tleubayeva, 2019b; Sergeyeva et al., 2023a; Wang et al., 2023). Rural tourism is a popular topic in the literature on tourism development (Nooripoor et al., 2021; Chen et al., 2022; Liu et al., 2023; Fu et al., 2024). However, a significant part of the research relates to the field of business recommendations, including the questions of whether rural subjects–farmers and other tourism products and services (He et al., 2021; Priatmoko, 2023; Hassan et al., 2024). Special attention is also paid to the study of the interrelationships between the various components

of rural activities (Shaken, 2020; Rakhimberdinova, 2022). It is necessary to pay close attention to the fact that rural tourism is an ideal springboard for the development of small and medium–sized businesses, which are characterized by some features – an orientation towards preserving environmental potential and a social component.

In addition, doing business in the field of rural tourism is directly interested in preserving the environment. This is objectively since an ecologically clean area, untouched nature, the availability of recreational resources such as forests, rivers, cultural and historical, architectural and archaeological sites are key conditions for the successful development of rural and sustainable tourism in the region in the long term (Aktymbayeva, 2017; Peira et al., 2021; Gao et al., 2023; Wendt & Bógdał-Brzezińska, 2024). In this regard, the active participation of an entrepreneur in environmental protection activities, restoration of cultural and historical monuments will become one of the indispensable conditions for the formation of permanent tourist flows, and consequently, increasing the incomes of individual citizens, regions and the state. This fact means that the entrepreneur is directly interested in the protection and reproduction of existing natural and cultural resources. Another conceptual feature of small business in the field of rural tourism is its pronounced social orientation. This is manifested in the activation of the comprehensive development of human capital, that is, in rural areas, the conditions necessary for proper rest are created (Tulla et al., 2017; Dong et al., 2025). Considering the above, it can be argued that in modern conditions rural tourism can become a significant source of additional and sometimes basic income for the rural population. This is especially true for depressed regions characterized by extremely low socio-economic development (Uskelenova & Nikiforova, 2024).

Rural tourism in Kazakhstan is a new socio–economic phenomenon focused on the use of natural, cultural, historical and other rural resources to create and offer a tourist product to a wide range of people (Kenebayeva, 2014; Zhenskhan et al., 2014; 2017). In this regard, it is necessary to proceed from the fact that the strategic priorities of regional policy aimed at stimulating the tourism sector in rural areas should be the concentration of tourist resources. This is necessary for the organization of rural tourism by creating destinations that include anchor tourist centers with a high potential for the formation of rural tourism tours and border areas to them (Shaikin et al., 2021).

The intensification of rural tourism will allow the development of territories that do not have promising industrial and agricultural organizations and thereby improve the socio-economic situation of the region. The resource potential of rural tourism is a set of interrelated and interacting opportunities that are used in tourism, as well as new ones formed in this activity and the use of factors of production in rural areas. Currently, with the development of tourism in Kazakhstan, more attention is required to search for tourist opportunities in the territory.

Rural tourism creates new jobs and brings real income to the regions, as well as allowing you to find means and ways to preserve nature. In many countries, the development of this type of sustainable tourism has become the main focus of protecting and recreating national rural landscapes. At the same time, industry has a serious multiplier effect and has a high social significance for the development of rural areas. Now, with the development of tourism entrepreneurship in Kazakhstan, a more careful attitude is required to search for tourist opportunities in the area and to detail the assessment of potential. In this regard, it is planned to obtain a methodology based on an analytical approach to real statistics.

This would help to identify new tourist advantages of the districts, find implicit advantages, and pay attention to those territories that were “in the shadow” of the tourist development process.

Research limitations in the work undertaken result from the adopted assumptions. Due to the availability of data, an analysis of the diversity of types and transport networks was undertaken. However, the full picture of the diversity of rural tourism shows the size of tourist traffic. Unfortunately, due to the lack of data showing tourist traffic, this is not possible. An additional limitation in rural tourism research is the problem of separating rural tourism from family trips, which are natural in each of the cases studied. In Kazakhstan, research is additionally hampered by strong family relations, a traditional way of life and the fact that most city dwellers came to them as part of the processes of migration and urbanization development. And traditional Kazakh society is still strongly connected with rural areas. However, research on the diversity of tourist attractions and transport accessibility shows the potential for the development of rural tourism.

MATERIALS AND METHODS

The research material includes data collected based on field research carried out in the period 2023-2024. Statistical data on transport in the Aktobe region and its districts come from the Akimat of Aktobe region from the Department of Passenger Transport and Highways of Aktobe region. All the factual material was verified and supplemented during field research (Sergeyeva et al., 2016; Kubessova, 2016; Sergeyeva et al., 2023b; data of the Department of Passenger Transport and Highways of Aktobe region and Agency for Strategic planning and reforms of the Republic of Kazakhstan, 2024).

Mathematical and statistical methods, valuation method, classic for research in the geography of tourism (Veal, 2017; Wendt & Bógdał-Brzezińska, 2018), were used to analyze the research results and the characteristics of rural tourism and transport net in the Aktobe region. Statistical methods were used for the analysis of spatial differentiation broken down into administrative units of the region. Administrative regions were subjected to a comparative analysis using quantitative methods (Creswell, 2003; Cheia, 2010) (Figure 1).

A simple ranking method was used to classify tourist attractions. For each group of tourist attractions (natural, geopolitical, historical, cultural), a ranking of Aktobe region districts was created, assigning 12 points to the first district in the ranking, and 1 point to the last one. It should be emphasized here that the weak point of this method is the adoption of the number of attractions in each group to determine the place of the district in the ranking. However, the choice of this approach allows for indicating the districts of Aktobe Region with the largest number of attractions. A similar solution was adopted for the classification of districts according to transport accessibility.

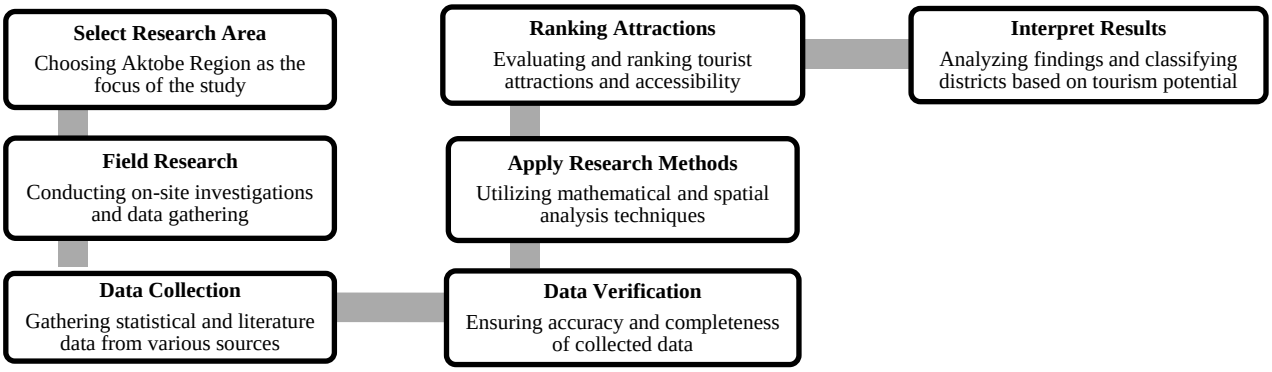


Figure 1. Stages of data collection, analysis, and interpretation for tourism research in the Aktobe Region (Source: Compiled by the authors)

Study area

Aktobe Region is located in the north-western part of Kazakhstan, between 51 and 45 degrees north latitude and 49 and 64 degrees east longitude. To the north, the region borders the Orenburg Region of the Russian Federation; to the west, it borders the West Kazakhstan and Atyrau regions; to the south-west, it borders the Mangystau Region; to the south, it borders the Republic of Uzbekistan; to the south-east, it borders the Kyzylorda and Ulytau regions; and to the east, it borders the Kostanay Region. The area of the region covers 300.6 thousand km². The length of the region from north to south is approximately 700 km, and from east to west, it is about 800 km. Aktobe Region consists of 12 administrative districts, with the regional center being the city of Aktobe (Figure 2).

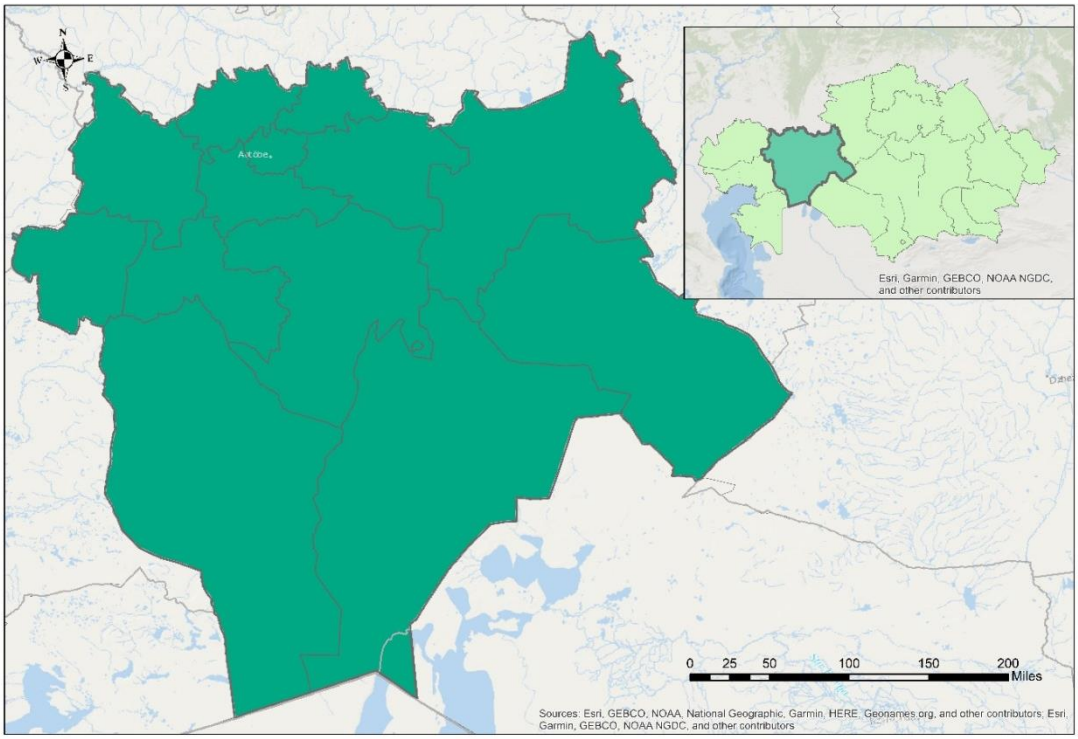


Figure 2. Study area – Aktobe Region, Kazakhstan (Source: compiled by the authors based on data from Esri, GEBCO, NOAA, National Geographic, Garmin, HERE, Geonames.org, and other contributors)

RESULTS

Tourism values in the Aktobe region

The Aktobe region is characterized by the diverse landscapes of river valleys such as the Ural, Zhem, Elek, Uil, Sagyz, Ebeity, Torgay, Irgyz, Khobda, and others. These areas feature beautiful intrazonal landscapes and include steppe, semi-desert, and desert environments, each with its unique flora and fauna.

The main tourist sites for visiting the Aktobe region can be divided into several categories:

- Historical and cultural sites
- Natural sites

Natural tourist attractions represent a broader category that encompasses not only geological features but also biological, climatic, and landscape elements of interest to tourists. These attractions may be associated with ecosystems, flora and fauna, water resources, climatic zones, and protected areas. They are commonly used in ecological and recreational tourism. Examples include nature reserves, national parks, waterfalls, lakes, and forested areas.

In the Aktobe region, natural monuments are classified into geological, paleontological, landscape, and botanical types. There are 33 natural sites of local significance and 33 cultural and historical sites in the districts of Aktobe region, including 7 of national significance and 26 of local significance (Figure 3).

One of the most significant in historical and cultural terms is the mausoleum of Abat–Baytak. The Abat–Baytak necropolis dates to the 14th century and is located in the Khobda district, 12 kilometers from the village of Taldysai. The monument has more than 200 memorial architectural structures, mainly stone–cutting steles-kulpytas. It is an outstanding monument of medieval architecture and the only portal–domed tent mausoleum preserved on the territory of Kazakhstan.

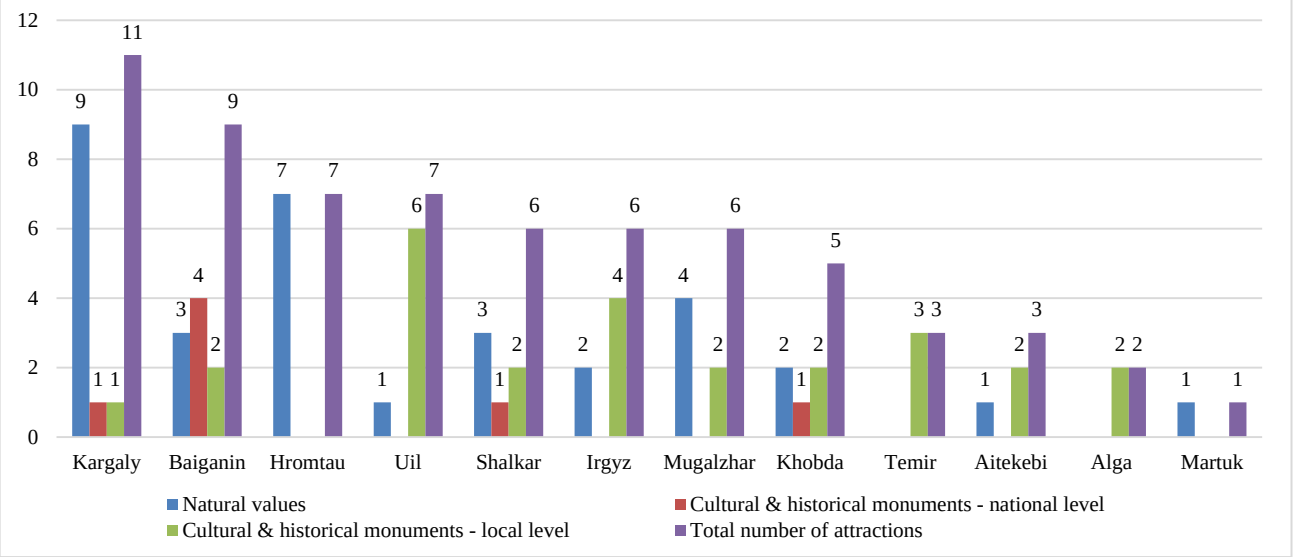


Figure 3. Classification of number of touristic values in Aktobe region and ranking of districts (Source: Author's elaboration based on Sergeyeva et al., 2016)

Koblandy Batyr Memorial Complex - The memorial complex consists of a mausoleum where the remains of Koblandy are buried (Koblandy Batyr is a famous historical figure who lived in the XIV–XV centuries.), a Hall of Fame and an obelisk. The top resembles a helmet with a shield and a bow placed next to it. The main wall of the mausoleum is about 7 meters high and is built of Russian-made red burnt bricks. The mausoleum was built in the form of a batyr's helmet, to which 15 supports are adjacent along the perimeter.

Historical and architectural complex "Keruen-saray". Shopping malls – Located in the Wilsky district in the village of Uyl. the main provisions of the Kokzhar Fair were approved on September 7, 1866, by the Minister of Internal Affairs of Russia. The Kokzhar Fair officially opened in 1867 in the Kazbek parish of the Ural region.

Yeset Kokiuly Memorial Complex - Location: Aktobe region, Alga district, 3 km away. east of the village of Bestamak. Date of the monument: 1667-1749 the memorial complex of Yeset batyr Kokiuly was built in 1992 on the site of the destroyed mausoleum. On the territory of the necropolis there are also mounds of the VI–V centuries, stone fences of the XIX century, a house for pilgrims. The mausoleum of Daribai – the mausoleum of Yeset batyr Kotybaruli, who lived in the nineteenth century, was built in 1890 from raw and burnt bricks.

The mausoleum was rectangular in shape, had a dome and painted walls. However, under the influence of natural factors, this mausoleum was destroyed. In 1993, the mausoleum was reconstructed in accordance with modern architecture, using elements of the national style. Khan Molasi Necropolis. The burial place of Abilkayir Khan. – located in Aktobe region, Aitekebi district, 77 kilometers southeast of Tolybai village, 4 kilometers 400 meters southwest of the confluence of the Ulkayak and Kabyrga rivers. The Khan Molasy burial site contains about 1,000 graves. As a result of many years of research to establish the historical identity of Khan Abilkair Kazhysultanuly (1693-1748), the remains found at the Khan Molasi necropolis were reburied, and in 2011 an obelisk was erected at this place.

The interaction of rural tourism with the environment determines the overall comfort of the region for the development of rural tourism, especially sustainable tourism. Natural and recreational resources are natural conditions, natural phenomena, create comfortable conditions for recreational and tourist activities and contribute to the organization of recreation and wellness. The main ones among them are climate, water areas, landscape, as well as some natural objects with cognitive and attractive properties. The steppe zone of Aktobe region has a unique combination of natural and recreational resources that cover a variety of natural landscapes. We offer a brief overview of the natural heritage of the districts. The interaction of rural tourism with the environment determines the overall comfort of the region for the development of rural tourism. Natural and recreational resources are natural conditions, natural phenomena, create comfortable conditions for recreational and tourist activities and contribute to the organization of recreation and wellness. The main ones among them are climate, water areas, landscape, as well as some natural objects with cognitive and attractive properties. The steppe zone of Aktobe region has a unique combination of natural and recreational resources that cover a variety of natural landscapes. We offer a brief overview of the natural heritage of the districts. The most striking natural landmark of the region is the Aktolagai plateau.

Aktolagai is a mountain range with a length of 90 km on the territory of Bayganin district, Aktobe region. It is a geological and geomorphological object of the state nature reserve fund, which has national and international significance. The peculiarity of the landscape of these places is the extremely thin cover of the Cretaceous mountains. In places, nature has created entire labyrinths of sheer walls, columns, niches, ledges, terraces, landslide amphitheaters of isolated outliers. Aktolagai is the former bottom of the world ocean.

Akkum (kaz. ak - bely, kum - sand) is a sandy valley located on the right bank of the Sagyz River in the Altai Batyr village of Bayganin district. Length 40 km, width 15 km. Here, the sands are fine-grained, loose, and little affected by the soil formation process. The state nature reserve "Ebita" (complex) is located on the territory of the Kargaly district. It is one of seven reserves of local importance. The motives of the organization are the preservation of reference areas of grass–grass steppes; unique kolochny forests of the steppe zone of birch, alder, poplar; habitats of red-book species of flora and fauna, picturesque areas in the valleys of the Zhaiyk, Ebita, Terekla Rivers. The picturesque coastal area of the Kargaly reservoir, located in a depression between the mountains, attracts with its unique beauty and the spirit of harmony. At the moment, the Qargaly Eco Resort recreation area is being built on the shore of the Kargaly reservoir.

Aschylysai waterfall is one of the most attractive tourist spots in the Aktobe region, located at a distance of 120 km. from the city of Aktobe. Located in a picturesque gorge among mountain rocks, hills, forests and lakes, it is in the heart of the Kargaly district. The waterfall was created by man in the 70s of the last centuries, when it was decided to build a special diversion of waters from the Great Aschylysai Sea in the gorge of the Ebita River, in other words, to create an artificial drain of water from melting glaciers. The Ebita River then flows into the Urals. The best time to visit the waterfall is from the end of April to the end of June, then the waterfall dries up. There is not much time for big water, but it encourages tourists not to postpone the trip for a pleasant adventure. Barkyn Sands is one of the few places where you can take therapeutic sand baths, useful for diseases of the musculoskeletal system, neuritis and sciatica.

This technique has scientific evidence behind it. It is believed that the sea used to overflow at this place. Now the water has drained away, leaving extraordinary hills of sand with an area of 35 thousand hectares. Irgyz-Turgai State Natural Reserve with an area of 763.5 hectares is located on the territory of Irgiz district.

The biodiversity of this territory is unique. There are 29 species of mammals, 250 species of birds, 14 species of reptiles, 4 species of amphibians and 10 species of fish on the territory of the reserve.

The Irgiz-Turgai State Natural Reserve is one of the largest and almost the only strictly protected steppe territory created for the purpose of preserving and restoring natural complexes, protecting habitats (wintering grounds, lettings, lambing), and migration routes of the saiga, a representative of the Betpakdal population.The Orkash Nature Reserve is a tract located near the village of Karakol in the Mugalzhar district of the Aktobe region of Kazakhstan. The tract was formed because of the weathering of the sandstone massif. It consists of extensive lowlands with sections of birch-aspen spikes located in them, between which there are bumpy sands, as well as a section of sand dunes.

Among the many types of tourism, it is worth paying attention to geotourism, which has been developing rapidly over the past few years. In its most general form, it involves visiting unique geological and geomorphological sites in order to satisfy one's own interest in natural phenomena. All geological objects in the Aktobe region are located in rural areas. The main objects of a geological nature include the Zhamanshin meteorite crater and the Aidarliasha geological section. Zhamanshin (kaz. zhaman shyn — zhaman — bad; shyn — peak, glassy brittle rock) is an impact crater in the Irgiz district of Aktobe region. It was in these places that a huge meteorite (possibly an asteroid or a comet nucleus) with a diameter of 200 to 400 meters fell about a million years ago. The diameter of the crater (along with the shaft), according to recent data, is about 13 kilometers, and its depth today is about 300 meters. In fact, Zhamanshin is a unique place where fossilized mollusks and corals can be found, and also, in fact, the first on the structure and composition of the tektites of the Zhamanshin crater are divided into two independent groups: zhamanshinites and irgizites (after the name of the Irgiz river).

Geomorphological section "Aidarlyasha" - at the beginning of the 20th century, scientists discovered clam shells frozen in stone on the banks of a steppe river in Kazakhstan. whose age was estimated at 350 million. This indicated that there was a sea here hundreds of millions of years ago instead of the Kazakh steppe. There are also several sanatoriums in the region for recreational and health purposes. Pantotherapy clinic "Zaru" is a modern sanatorium-pantotherapy, maral breeding farm "Zaru", located in the village of Kazanka in the Martuk district of the Aktobe region. Antler baths, phyto barrels, panto inhalations, massages – all procedures are based on natural medicinal raw materials given by marals. They were imported from East Kazakhstan Region in the amount of 150 heads.

Antlers are cut off from animals once a year. Antlers are used for diabetes mellitus, nervous disorders, mental and physical exertion. The course of treatment lasts from 5 to 10 days. The cost of the stay includes accommodation, four meals a day with eco-products from your own farm.

The Shipager Sanatorium is located in the Alga district. Since 2001, the sanatorium has been accepting vacationers for treatment, prevention and rehabilitation. It offers such services as mud treatment, bischofite baths, coniferous baths, pearl baths, phyto barrel, etc. Figure 4 shows the popular attractions of the region.

Also, in Aktobe region, there is great potential to develop rural tourism in the field of saumalotherapy and koumiss treatment, shubatotherapy specializing in the production of koumiss (fermented milk product made from mare's milk and saumal (fresh mare's milk, has medicinal properties, shubata (fermented milk product made from camel milk) providing sightseeing and tourist services within the framework of enterprises. The functioning of enterprises that produce koumiss and saumal lies in the fact that the family enterprise produces small amounts of high-quality koumiss, selling products mainly for sale. The owners of the production are constantly searching for outlets to a paying audience through the sale of koumiss and saumal through dairy stores, dairy boutiques and direct sale to tourists and tourists (Sergeyeva et al., 2024).

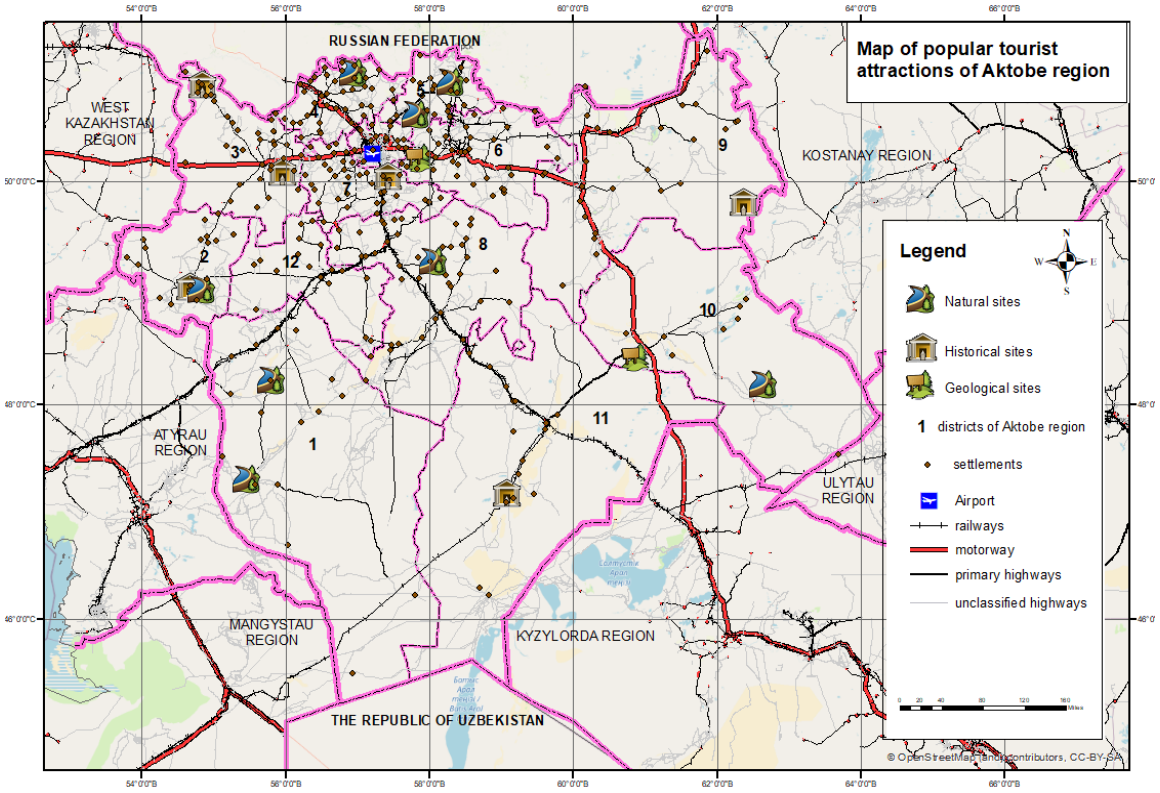


Figure 4. Map of popular tourist attractions of Aktobe region. 1. Baiganin district; 2. Uil district; 3. Khobda district; 4. Martuk district; 5. Kargaly district; 6. Hromtau district; 7. Alga district; 8. Mugalzhar district; 9. Aitekebi district; 10. Irgyz district; 11. Shalkar district; 12. Temir district (Source: Map compiled by the authors based on data from Visit Aktobe, 2024)

Transport net in Aktobe region

The total length of the road network in the Aktobe Region is 6,553 km, including 1,893 km of national roads, 1,057 km of regional roads, and 3,602 km of local roads. Aktobe Region is connected to the West Kazakhstan and Kyzylorda Regions via the Samara-Shymkent highway, to the Atyrau Region via the Aktobe-Atyrau-Astrakhan highway, and to the Kostanay Region via the Aktobe-Astana highway. Additionally, through the Aktobe-Martuk-Russian border, Aktobe-Orsk, Karabutak-Komsomol-Severnoe-Ushkatty highways in the north, and the Shubarkuduk-Uil-Kobda-Sol-Iletsk highway in the northwest, the region has direct access to the Russian Federation (Figure 5).

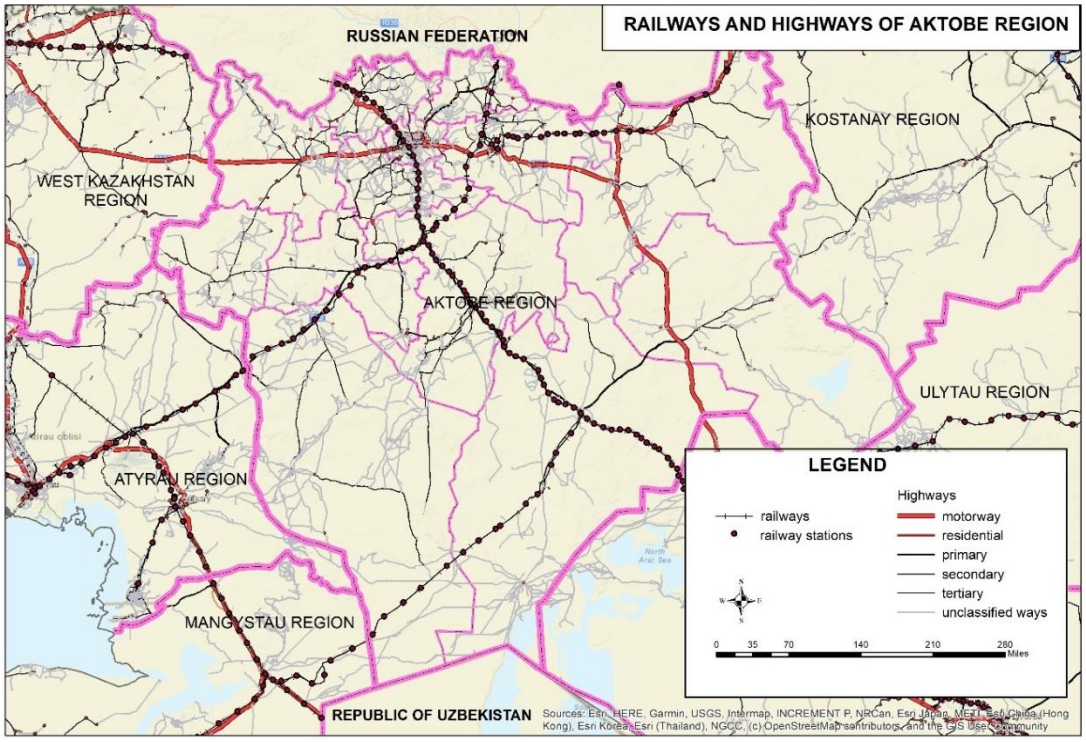


Figure 5. Road and railway system in Aktobe region (Source: OpenStreetMap; Compiled by the authors)

The international investment megaproject “Western Europe – Western China” has been successfully completed in the Aktobe Region. The total length of this corridor is 8,445 km, including 2,787 km across Kazakhstan. Of this, 621 km of the transport corridor pass through the Aktobe Region. It also facilitates the transportation of tourists, as it is located in the very center. The total length of the railway network in the Aktobe Region is 1,514.4 km, featuring 29 railway stations and 23 passenger platforms. At Aktobe station, 10 passenger trains operate, including 4 transit routes and 6 domestic routes within Kazakhstan. Currently, railway connections from Aktobe cover eight destinations, including: Kyzylorda Region via Sekseul station; Atyrau Region via Sagyz station; Kostanay Region via Aiteke Bi station; West Kazakhstan Region via Jaysan station; Southern Ural and Russian Federation via Nickeltau station.

Within the boundaries of the Aktobe railway division, there are six junction points: Zhaisan, Orsk – Novy Gorod, Aiteke Bi, Sagiz, Sekseul, and Tassai. Among them, Orsk – Novy Gorod is an interstate junction and is part of the South Ural Railway (RZD, Russian Federation). The remaining junctions connect as follows: Sekseul with the Kyzylorda railway division; Sagiz with the Atyrau railway division; Zhaisan with the West Kazakhstan railway division; Aiteke Bi with the Kostanay railway division and Tassai with the Mangystau railway division. The railway network includes 96 control points, comprising 54 stations, 36 passing loops, and 6 block posts.

The aviation potential of the region significantly contributes to the development of transport and logistics. The Aliya Moldagulova International Airport meets all the necessary requirements for establishing an aviation hub in the region.The airport's designed capacity allows for the handling of 400 passengers per day; however, during peak periods, three to four flights can serve up to 2 000 passengers simultaneously.The airport continues to increase its volume of aircraft and passenger services annually. Currently, flights operate to nine destinations, including five domestic routes (Astana, Almaty, Aktau, Atyrau, and Turkestan) and four international routes (Istanbul, Sharm El-Sheikh, Doha, and Phuket) (Figure 6).



Figure 6. Airport Aktobe and fly connection (Source: Department of Passenger Transport and Highways of Aktobe region, 2025a “Transport indicators of Aktobe region” Unpublished report. Compiled by the authors)

By the end of 2024, the airport handled over 900,000 passengers, ranking sixth among national airports, following Almaty, Astana, Shymkent, Aktau, and Atyrau. In 2024, the airport aims to serve 1 million passengers and enter the top three national airports. Additionally, new flight routes are planned, including: Kazan, Russia (twice a week);

Tbilisi, Georgia (twice a week); An increase in flight frequency to Sharm El-Sheikh, Egypt, from two to three times per week. The road network development in Aktobe Region is uneven, with well-maintained national highways contrasting with less developed local roads. The Aktobe region has 314 settlements. Mugalzhar district leads in the number of settlements with 34 followed by Martuk, Shalkar, and Khobda districts. In terms of road density, Martuk, Kargaly, Hromtau, and Alga districts have the highest indicators, while Shalkar and Temir districts have the lowest density of transport roads. Regarding the number of railway stations, Mugalzhar and Shalkar districts are leading. Meanwhile, Irgyz, Uil, and Khobda districts have no railway network. The airport is located in the regional center, Aktobe city. The fastest travel time from a district to the airport is 2 hours from Alga district. Martuk, Kargaly, Khobda,

and Khromtau districts are also relatively closer to the airport, with an estimated travel time of 2.5 to 3 hours. The most remote districts from the airport are Shalkar and Irgyz districts, with a travel time of 7.5 to 8.5 hours (Table 2).

Table 2. Ranking of the district of Aktobe region by road density and access to railway stations and travel time to the airport (Source: Department of Passenger Transport and Highways of Aktobe region, 2025b. Transport indicators of Aktobe region. Unpublished report; Compiled by the authors)

Administrative unit	Road density	The number of railway stations	Travel time to airport (hour)	Number of points
1. Baiganin district	14.1	6	5	24
2. Uil district	25.3	*	4.5	22
3. Khobda district	17.5	*	2.5	31
4. Martuk district	47.9	10	2.2	32
5. Kargaly district	51.64	2	3	15
6. Hromtau district	24.3	6	2.46	27
7. Alga district	35.5	7	2	29
8. Mugalzhar district	15.1	19	2.31	34
9. Aitekebi district	14.1	8	5.5	27
10. Irgyz district	6.64	*	7.5	18
11. Shalkar district	5.3	21	8.5	32
12. Temir district	7.3	4	3	23
Aktobe region	264.68	80		314

DISCUSSION

Aktobe region from the point of view of tourism, as it is shown (Figure 1; 2), is rich in natural values that enable the development of sustainable tourism and rural tourism. The results of research conducted in other regions of Kazakhstan (Sergeyeva et al., 2022; 2024; Kubessova, 2016), in North Kazakhstan (Dmitriyev et al., 2021a; 2021b; Wendt et al., 2021a), West Kazakhstan (Aktymbayeva et al., 2017) or in the Altai Mountains (Chernova & Sukhova, 2017; Chlachula, 2019) confirm our results. Transport accessibility, as an economic and geographical category, is defined differently in scientific literature: in relation to the transport complex as an industry indicator, to social development as a factor of population mobility, and to economic development as a factor of economic connectivity efficiency. A precise definition of this indicator and a formalized approach to its calculation have significant practical importance. A considerable number of scientific studies, both foreign and domestic, have been dedicated to transport accessibility (Khadaroo & Seetanah, 2008; Virkar & Mallya, 2018; Samková & Navrátil, 2023; Rohini & Meenakshi, 2024). Many of these studies focus on transport networks as key elements shaping accessibility (Michniak et al., 2015; Dinu, 2018; Pellegrino, 2021).

They also highlight that transport accessibility is largely associated with indicators of transport development (provision) in a given territory or city (Wendt et al., 2021b; Sánchez-Rivero et al., 2024; Syzdykbayeva et al., 2025). The development of rural tourism in the region depends on the accessibility of key attractions from major transport roads, railway stations, and travel time to transport hubs (Sergeyeva et al., 2022; Saparov et al., 2024).

The transport potential of the Aktobe region is considerable. The region operates railway, road, air, and pipeline transportation modes. However, the quality and density of the transport infrastructure remain underdeveloped. It is worth noting that, due to its favorable geographical location, the region has a well-developed transport infrastructure. The length of major railway routes such as Uralsk – Mangystau and Central Asia – Europe exceeds 1,000 km. The international highway "Western Europe – Western China" also passes through the region. An analysis of table 2 reveals the influence of these factors on the tourism potential of rural areas.

In 2025, the average population density of the Aktobe region was 3.1 people per square kilometer. The territory of the Aktobe city administration had the highest population density in the region, where the regional center, the city of Aktobe, is located. The Alga, Martuk, and Hromtau districts had population density above the regional average.

In the other ten administrative districts of the Aktobe region, population density varied from 0.3 to 3.1 people per square kilometer. The largest districts, such as Irgyz (41 500 km²), Baiganin (60 200 km²), and Shalkar (61 000 km²), are characterized by low population density (less than 1 person per km²) and limited transport accessibility, making them less favorable for rural tourism development.

Conversely, areas such as Martuk (6 500 km²) and Kargaly (5 000 km²) feature higher population density (4.57 and 3.09 people per km², respectively) and a more developed road network, making them more suitable for tourism (Table 1). Geographical diversity of population density and transport accessibility with relatively low domestic demand for agritourism services (Tulbayeva et al., 2017; Saparov et al., 2024) may result in low level of utilization of the region's tourist potential, which is confirmed by other studies on the development of rural tourism in Kazakhstan.

The analysis of data on natural resources and historical landmarks shows that the most attractive districts for rural tourism development are Kargaly, Hromtau, and Mugalzhar. These areas are rich in natural landscapes and cultural sites, making them appeal for rural tourism. However, the success of tourism in these districts will depend on the efficiency of the transport infrastructure. For instance, Mugalzhar district has 19 railway stations, facilitating travel for visitors. Meanwhile, Irgyz and Baiganin districts possess natural attractions but lack railway stations, which may hinder tourist influx (Figure 5 and Table 2). A well-developed road infrastructure is crucial for the growth of the tourism industry and the enhancement of its overall potential (Dmitriyev et al., 2021b; Wendt et al., 2021b).

A vast steppe territory requires a reliable and extensive road network to ensure connectivity between settlements. The density of roads is a key criterion for assessing the state of road infrastructure. The leader in road density in the Aktobe region is Kargaly district (51.64 thousand km/km²), followed by Martuk district (47.9 thousand km/km²) and Alga district (35.5 thousand km/km²). Above-average transport infrastructure development is characteristic of Uil, Hromtau, Mugalzhar, Aitekebi and Baiganin districts. The lowest road density is observed in Shalkar (5.3 thousand km/km²), Irgyz (6.64 thousand km/km²) and Temir (7.3 thousand km/km²) districts.

CONCLUSION

The transport potential of the Aktobe region is considerable. The region is served by rail, road, and air transportation systems. However, the quality and density of transport infrastructure necessary for the development of rural tourism remain insufficiently developed. Based on data analysis, several patterns can be identified. The conducted research and data analysis covering the diversity and geographical distribution of natural assets indicates the presence of numerous tourist attractions in the Aktobe region. Many of these can be incorporated into the region's tourism offerings to enhance rural tourism development. The study has achieved its goal of analyzing the conditions for tourism development in the Aktobe region through spatial differentiation, based on the distribution of tourist attractions and their transport accessibility.

It enabled the identification of areas with limited transport access to tourist sites (Shalkar, Irgyz and Temir districts), as well as the determination of priority areas for investment in transport infrastructure that could foster an increase in tourist flows, particularly in the rural tourism sector. The highest road density is observed in the border districts of Kargaly, Martuk, Alga, as well as in the city of Aktobe, with figures ranging from 24.3 to 51.64 km/km². The lowest road density is recorded in the Shalkar district — 5.3 km/km². A comparative analysis of the current state of the transport network in the Aktobe region reveals an overall lack of well-developed road infrastructure.

More than 60% of roads in the region are in poor condition. Priority infrastructure development is needed in districts with high tourism potential— Kargaly, Martuk, Alga, Mugalzhar. Meanwhile, areas with average transport accessibility, such as Mugalzhar and Baiganin, may be promoted as destinations for niche tourism (e.g., ecotourism, adventure tourism), but this requires the expansion of the road network and the establishment of logistics hubs.

Since all districts in the Aktobe region are rural, and tourist attractions—particularly natural monuments—are scattered throughout the region, air transport is not a viable option for most tourists. The only airport is in the city of Aktobe. Additionally, the absence of railway stations in the Irgyz, Uil, and Khobda districts restricts access to these areas by rail. Therefore, road transport remains the most viable means of reaching tourist destinations. The use of railway routes for tourism is also promising. Districts with well-developed rail networks, such as Mugalzhar and Shalkar, can be considered as hubs for organizing tourist excursions.

Developing tourist routes based on accessibility is critical for attracting visitors. Routes should consider not only natural and cultural attractions but also convenience of transportation access. The underdevelopment of the transport network, as shown by statistical analyses of road, rail, and air infrastructure, strongly supports the hypothesis that the current transport system, despite the abundance of natural assets, limits the tourism accessibility of the Aktobe region.

To stimulate demand, it is important to recognize that despite the variety of tourist attractions, the lack of developed transport infrastructure, telecommunications, and basic public services undermines the region's competitiveness in the tourism market. Therefore, improving the accessibility of tourist sites and developing tourism infrastructure is essential. This requires the implementation of phased activities, including construction or major repair of roads leading to tourist attractions, installation of road signs and informational boards for tourist sites and improvement of surrounding areas, particularly through the development of camping zones. Enhancing the road network and improving the accessibility of remote areas will help balance tourist flows and increase the economic impact of rural tourism development.

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HOW TOURISM, GLOBALIZATION, AND EDUCATION DRIVE WOMEN'S EMPLOYMENT IN SERVICE SECTORS? EVIDENCE FROM THE INDO-PACIFIC COUNTRIES

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Abstract: The primary aim of this study is to investigate the significance of tourism, globalization, foreign direct investment (FDI), exports, and education on women's employment in the service sectors in selected Indo-Pacific countries. This study uses balanced panel data from 1991 to 2022 in its methodology. To achieve the results, the fixed and random effect models were applied as a baseline model, and the GLS model was used to check for robustness. The findings suggest that enhancing the tourism industry significantly impacts women's employment in service sectors; fostering globalization and increasing FDI can also considerably improve women's employment. Tourism significantly influences women's employment in the service industries of Australia, India, Japan, the Philippines, and Thailand. Globalization has exerted a substantial and beneficial influence in eight countries. Foreign direct investment has a beneficial impact on just three countries: China, Singapore, and Vietnam. Foreign direct investment (FDI) impedes female employment in the service industries of India and Thailand. Exports enhance female employment in Australia, Japan, Thailand, and Vietnam. Education has a positive impact on women's employment in China, Japan, the Philippines, and New Zealand. The quality of education adversely affects women's employment in Thailand. The adverse effect of exports on female employment warrants further investigation to understand underlying causes and develop targeted policies. The study also examined the performance of individual countries, finding that tourism and globalization positively influence women's employment in Australia, Indonesia, India, the Philippines, Thailand, Vietnam, and New Zealand. This research contributes and provides precious insights for policymakers to promote comprehensive economic growth and women's empowerment in the Indo-Pacific region.

Keywords: women's employment, tourism, service sector, Indo-Pacific, globalization, gender equality, economic development

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INTRODUCTION

The diverse economies of the Indo-Pacific region are essential for the global economy. In these regions, tourism, globalization, foreign direct investment (FDI), and export expansion are the dynamic service industries that significantly impact the labor market, particularly for women's employment. As the region integrates more and more into the global economy, the positive impacts of these economic forces on women's employment in the service sectors are becoming important. Due to this expansion, women now have more work options and play a more significant role in tourism, education, and service industries (Alrwajfah et al., 2020). In 2024, LinkedIn data indicated that women's presence in the workforce continues to lag behind that of males in almost all industries and economies, with women comprising 42% of the global workforce and 31.7% of senior leadership positions (World Economic Forum, 2024). The service industry, a significant driver of the global economy, has contributed to boosting Gross Domestic Product (GDP) and employment, particularly in the Indo-Pacific region (Bajo-Rubio & Zhou, 2024). Many countries in this region have experienced rapid growth in services, creating jobs at a rate faster than traditional industries, such as manufacturing and agriculture. Women, who comprise a significant share of the workforce in the service industry, have been essential to this growth, particularly in information technology, tourism, education, and healthcare (Zhang et al., 2022).

Tourism, one of the most dynamic industries in the Indo-Pacific region, significantly boosts employment and economic growth. According to UN Women. (2022), women comprise approximately 54% of the global tourism industry workforce. This percentage is particularly notable in specific countries within the Indo-Pacific region. In Thailand, the participation rate of women in the labor force is 59.86% on average compared to 68% in the tourism sector (WEF, 2024; Ramirez et al., 2023). The industry provides various career options, from tourism and hotel services to the cultural and creative sectors. These alternatives give women more economic power, especially in rural areas with fewer traditional job options. However, regarding women's employment, not all areas benefit equally from tourism. Furthermore, the nature of work in the tourism industry often entails low-paying, informal positions with limited

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opportunities for career progression, which can exacerbate gender inequality rather than alleviate it (Dikilitas et al., 2022; Araújo-Vila et al., 2021). Due to globalization, the Indo-Pacific region's economies are part of global value chains. This has had a significant impact on women's employment. The expansion of service industries, especially in metropolitan areas, has been fueled by the opening of markets and the influx of international goods and services. For example, globalization has enabled the expansion of Information Technology (IT) services, retail, and banking sectors in countries like Malaysia, Thailand, and Vietnam, giving women more work options (Dewi et al., 2023). Globalization does have drawbacks. The increased need for highly trained labor has favored individuals with access to high-quality education and training, which frequently disadvantages women, especially in rural and underprivileged areas. For instance, in Indonesia, women who live in urban areas have more employment options in the service industry. In contrast, women living in rural areas are disadvantaged due to differences in education and training (World Bank, 2021).

Foreign Direct Investment (FDI) is essential to economic growth in the Indo-Pacific region. FDI inflows have generated employment opportunities in the banking, retail, and telecommunications sectors. Developing Asia, comprising China, India, and Singapore, was the leading recipient of over $621 billion in FDI in 2024 (UNCTAD, 2024). Since they now comprise a sizable portion of the workforce in industries such as retail and finance, women have benefited from FDI by creating new job opportunities in these areas.

For example, women comprise 49.2% of Singapore's financial services industry workers, a figure that has been continuously increasing as Foreign Direct Investment (FDI) expands (Singapore Business Review, 2022). The benefits of FDI vary among countries, indicating variations in how states attract and use overseas investments. While some countries have successfully utilised FDI to stimulate innovation, enhance infrastructure, and offer high-quality employment opportunities, others require assistance in attracting desirable investments, resulting in a reliance on low-wage, low-skill jobs. The Asian Development Bank (2022) highlights that variations in regulatory frameworks, political stability, and workforce capabilities across the Indo-Pacific *countries* result in disparate consequences from FDI.

The expansion of export-oriented economic activities in the Indo-Pacific *countries* has significantly impacted on women's employment, particularly in the IT, tourism, and education service industries. Many women are employed in the IT and industrialization outsourcing (BPO) industries, led by the Philippines and India. For instance, in the Philippines, women comprise 70% of the workforce in the BPO industry, which has expanded rapidly due to increased export demand (Oxfam International, 2022). The development of the export sector has also drawn attention to the problems associated with gender segregation in the workforce, despite providing women with new opportunities (Raihan & Tuspekova, 2022). There is a concentration of women in service-related fields, often in lower-paying and less secure jobs. In India, for instance, women are disproportionately represented in the IT services industry. However, they are more likely to be found in entry-level jobs with little room for growth than their male colleagues.

Enhancing women's employment prospects in the service sectors of the Indo-Pacific *countries* depends primarily on education. Education significantly impacts women's employment in the service sectors across this region, influencing their ability to benefit from tourism, globalization, FDI, and export activities. Higher levels of educational attainment typically correlate with better job opportunities and higher wages for women (UN Women, 2024). Women with higher education tend to have greater economic freedom, higher incomes, and better career opportunities. Significant female engagement has been observed in service sectors like education, healthcare, and professional services in countries like South Korea and Japan, where women's educational attainment is high (OECD, 2023). In the Philippines, female CEOs are gradually rising; women currently comprise 40% of the executive leadership team (ELT) in publicly Listed Companies (PLCs). Although female CEOs remain underrepresented at only 13%, the proportion of women on boards of directors has continued to rise (PBCWE, 2024). The low percentage of women in management roles in Japan's labor sector limits chances for advancement. A Ministry of Health, Labor and Welfare report indicates that, among industrialized nations, the proportion of women in managerial roles was just 13.2%, one of the lowest (McKinsey & Company, 2025).

Additionally, the service sectors in the Indo-Pacific region are experiencing rapid growth and expansion, making them a key driver of economic development in the area. This research focuses on the service sector in the Indo-Pacific region. Among various drivers, these are essential indicators highly related to service sector jobs.

Previously, various research happened in BRICS (Pandey & Sergeeva, 2022), G7 (Çil & Guzey, 2024), Latin America (Braunstein & Seguino, 2018), and many regions. Indo-Pacific countries are overlooked and underexplored in the research on women's employment in the service sectors.

The objectives of this study are:

i. To examine the specific effects of tourism, globalization, FDI, exports, and education on women's employment in the service sectors across selected Indo-Pacific countries.

ii. To determine the effect of these drivers on women's employment in the service sectors in specific countries.

iii. To suggest some policy recommendations for enhancing tourism, globalization, FDI, exports, and education to support and improve women's employment in the service sectors across the Indo-Pacific zone and specific countries.

Section 2 presents the literature review, and Section 3 of this study represents the theoretical and conceptual framework. The methodology used in this study is discussed in Section 4. Section 5 presents the results and discussion, and Section 6 concludes with the recommendations. Appendix A shows the list of countries, and Appendix B shows abbreviations.

LITERATURE REVIEW

1. Tourism and women's employment

This study critically evaluates the existing body of literature on the impact of tourism on women's employment in the

Indo-Pacific region. Several studies emphasize that tourism has substantial employment prospects for women, especially in hotel administration, tour coordination, and cultural enterprises (Zhang & Zhang, 2020). Although tourism is often praised for its ability to empower women economically, research suggests that it has both long-term benefits and enduring challenges (Zhang & Zhang, 2020). The International Labor Organization (ILO, 2022) has conducted a recent study highlighting how these conditions increase employee turnover rates and hinder career advancement opportunities for women in the tourism industry. The literature also emphasizes how tourism gives women access to entrepreneurial opportunities. Women-owned tourist enterprises have experienced significant growth in this region, enhancing women's financial independence, self-determination, and contributing to the local economy (Pécot et al., 2024). As a result, tourism benefits women's economic empowerment through entrepreneurship and provides jobs (Alrwajfah et al., 2020; Tegegne et al., 2024).

Women in the tourism industry are disproportionately impacted by the unstable conditions of tourism jobs, which frequently involve seasonal employment, and a lack of job stability (Toanoglou, 2018). The COVID-19 pandemic has worsened these issues, with women being more susceptible to job loss and lower working hours compared to men (Zhang et al., 2022). Social and cultural restrictions significantly limit women's participation in the tourism industry, particularly in specific *countries*. Traditional gender roles in numerous Indo-Pacific countries limit women's employment prospects, particularly in professions that require public engagement, which may be considered unsuitable according to societal norms. Based on the literature review, this study developed the first hypothesis that the tourism industry can significantly empower women.

H_1: Women's employment in service sectors, especially in the tourism sector, has increased due to the growth of the tourism and hospitality industry in a few Indo-Pacific regions.

2. Globalization and female employment

The Indo-Pacific region's economy has experienced economic transformation due to globalization, which has expanded markets for products and services and integrated them into global value chains. In the service enterprise, this economic integration has substantially influenced women's employment patterns (Das & Ray, 2020; Rahman et al., 2024). Globalization has a more significant impact on economic rights than social rights in empowering women (Husain et al., 2024). The expansion of service sectors, such as IT, BPO, retail, and finance, is responsible for increasing female participation in the Indo-Pacific region. For example, the rise of these industries is a vital source of employment for women in the Philippines and India because it provides them with generally well-paying jobs and contributes to their economic empowerment. This development has had a positive impact, as the new opportunities approach to reducing gender inequality uses the positive effects of economic globalization to give women more significant employment opportunities and more robust professional networks. Economic globalization also facilitates access to economic opportunities (Akbar et al., 2020). The advancements of regional economies into global markets correlate with the emergence of female entrepreneurship. Women have successfully established enterprises by utilizing international networks and market opportunities, particularly in the retail and e-commerce sectors (Asongu et al., 2020). The emergence of digital platforms has also bolstered entrepreneurship's expansion by reducing obstacles for women and increasing their access to a worldwide consumer base. The second hypothesis was developed based on the literature reviewed.

H_2: Higher levels of globalization are positively related to increased women's employment in service industries in Indo-Pacific countries.

3. FDI and female employment

Foreign Direct Investment (FDI) serves as an essential revenue stream for governments and a vital source of capital for private firms, acting as a powerful engine of economic growth (Fazaalloh, 2024). Driving labor demand and boosting household incomes can influence women to engage in the service sector through various transmission channels (Rahman & Kim, 2023). FDI can lead to the expansion of industrialization and enhance government revenues, which in turn can create more employment opportunities and improve economic conditions, potentially impacting gender dynamics within the workforce. A sizeable portion of FDI is directed toward sectors that employ a female workforce, and, in that case, the demand for female labor will rise more sharply than male labor, reducing the labor participation rate gap (Achmad, 2024). The benefits of FDI are not uniformly distributed. Women often find themselves in lower-skilled and lower-paid positions with limited prospects for career advancement (Mari, 2024). Even with the possible advantages, FDI does not always have a favorable effect on women's employment. Women's access to resources significantly influences the impact of FDI inflows and exacerbates gender disparities in contexts where women have limited access to land, non-land assets, and financial resources. Additionally, the positive effects of FDI on gender equality are diminished in countries where women face more bureaucratic hurdles than men when starting industrialization. While FDI may create numerous jobs, it can also lead to poorly paid occupations, substandard working conditions, and a lack of job security (Kucera & Tejani, 2014). Substantial portions of the female population may not be able to benefit from FDI-driven growth due to this spatial imbalance, which has the potential to exacerbate already existing disparities.

H_3: Increased FDI inflows resulted in a notable rise in women's employment in the Indo-Pacific regions.

4. Export and women's employment

In the Indo-Pacific area, the growth of export-oriented industrialization has given women significant job prospects, particularly in labor-intensive industries like textiles, apparel, electronics, and agriculture (ADB, 2022). In Bangladesh, Vietnam, and Cambodia, women comprise a large part of the labor force in the export-oriented manufacturing industry

(Karim et al., 2024). These positions have contributed to the economy's growth, providing women with income and financial independence. Export-led growth has also increased women's engagement in non-traditional industries, such as BPO and IT services. Compared to traditional industrial professions, export industries typically offer better job security and provide opportunities for skill improvement in the emerging job market. One of the primary issues is the prevalence of women in low-skill, low-wage positions within the export industry (World Bank, 2020). Although women now have more employment in exports, these occupations frequently come with low pay, lengthy hours, and unfavorable working conditions. Women are disproportionately employed in low-paying, unstable occupations with limited prospects for advancement in numerous export-oriented industries, such as electronics and textiles. Women's employment has increased significantly in some countries and industries but not in others. Export-driven job possibilities are less likely to benefit women in rural areas or with lower education and skills, exacerbating existing disparities (Ghosh & Ghosal, 2020).

H_4: In Indo-Pacific countries, there is a positive relationship between exports and increasing women's employment.

5. Education and women's employment

Education is universally acknowledged as a fundamental instrument that helps women enter the job market and supports women's empowerment, strengthening their society and autonomy. The Indo-Pacific region's diverse economic, environmental, and cultural variations make the relationship between education and women's employment vital. In the workplace, education is essential because it influences women's job positions, salary levels, and career advancement (Garibaldi, 2014). The increase in tertiary education has typically reduced disparities in the workplace due to increased enrollment and attainment of educational degrees (Pasek & Ratkowski, 2021). The literature on the impact of education on women's employment in the Indo-Pacific region has been thoroughly reviewed, focusing on key trends, challenges, and knowledge gaps. Increased labor force participation, better employment chances, higher earnings, and greater economic empowerment for women are highly connected with higher educational attainment (Kabeer, 2018). Countries like Australia, New Zealand, and Singapore in the Indo-Pacific region have demonstrated how investing in education can lead to improved job outcomes for women. In Australia, for instance, women who have completed their higher education are more likely to hold high-paying, high-skilled positions, particularly in service industries such as banking, healthcare, and education (Riaz & Pervaiz, 2018). Based on the literature review, Hypothesis 5 was developed.

H_5: In the Indo-Pacific countries, women's higher educational attainment has a positive relation with increasing employment in the service sector.

Although numerous studies examine the influence of these variables on economic development and total women's employment, research on how they specifically affect women's employment in the service sector is limited. The lack of targeted studies in this sector creates a gap in understanding the gender-specific implications of these economic drivers. Most existing literature concentrates on developed Western countries or other global regions, overlooking the Indo-Pacific countries. Because of the tourist hub, a highly globalized area with some export centers, and FDI-led economic activities, it is essential to focus on the Indo-Pacific countries. More research is needed to explore the impact of tourism, globalization, FDI, exports, and education on women's employment within these diverse and rapidly rising countries.

Various research studies have been conducted on the total employment of women, but they do not specify the subsectors of employment. Among the three sectors (agriculture, industry, and service sector), the service sector is increasingly recognized for its importance in providing employment opportunities for women. There needs to be more analysis on how the impact on women's employment in the service sectors is expanding, specifically in the Indo-Pacific. Many studies examine the combined effect of selected variables on regions like BRICS, G7, SAARC, and ASEAN, but ignore the impact of specific countries. This study utilizes several theories such as feminization of tourism employment theory, human capital theory, and the capability approach, to contribute to the academic field. Overall, this research aims to fill existing literature gaps by focusing on the Indo-Pacific countries and conducting country-specific analyses, examining a unique combination of variables and their specific impact on women's employment in the service sector.

THEORETICAL BACKGROUND AND CONCEPTUAL FRAMEWORK

1. Theoretical background

The tourism industry is a labor-abundant industry that has become a significant economic driver in the Indo-Pacific countries. As per the "feminization of tourism employment theory (FTET)," women are destined to be utilized in the tourism industry related help jobs, like accommodation, housekeeping, retail, and social services, because of their orientation to providing care and administrative support services. The feminization of the tourism industry business hypothesis holds enormous pertinence for understanding orientation elements in the working market, especially regarding creating and rising economies (Srivastava et al., 2024). It highlights the tourism industry as a key driver of women's economic empowerment, extending to positions in ventures typically associated with hospitality, caregiving, and customer service. This hypothesis offers a framework for examining how cultural norms and economic development influence women's employment in the tourism industry.

From a developmental perspective, the feminization of the tourism industry business shows that the area's capability to advance orientation fairness for women is strengthening. By opening doors, the tourism industry empowers women to achieve economic freedom. The hypothesis results in social and economic changes commenced by the tourism industry, especially in male-centric social orders where the women's labor force has generally been limited. Nonetheless, the feminization of the tourism industry in business additionally uncovers difficulties, for example, gender wage gaps,

work-related isolation, and restricted professional success. It investigates how customary orientation standards might bind or limit women to low-wage and low-expertise jobs, propagating an imbalance even as women enter the labor force. Economic theories, including human capital theory, labor market segmentation theory, and the capability approach, explain the labor market dynamics and gender differences in employment. These theories analyze the impact of globalization, education, and public policy on gender disparities and explore the reasons behind women's potentially distinct experiences in the job market compared to men. Amartya Sen's capability approach also focuses on improving an individual's capabilities to attain the desired outcome. By focusing on the freedom and opportunities available for women in the labor market, these theories can also be used to analyze gender disparity.

Sen (1999) emphasized the importance of women's capabilities, including education, health, and training, in achieving gender equity in the job market. The framework of the study is presented in Figure 1.

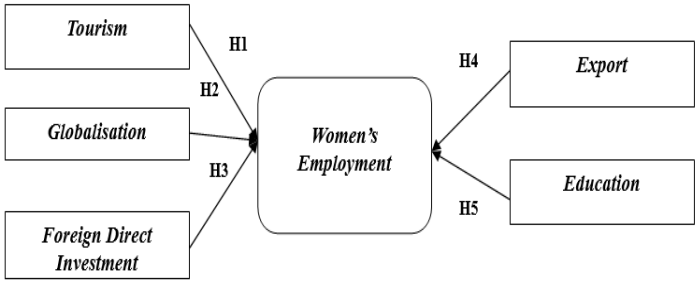


Figure 1. Conceptual framework based on different drivers of women's employment in service sectors

2. Conceptual Framework

Women are involved in hospitality, healthcare, education, retail, customer service, and administrative sectors. Women are also engaged in the service sector because of their interpersonal, communication, and cognitive skills, which make them emotionally intelligent and help build their connections with others. The restructuring of the economy reinforces the comparative advantage and reverses the labor demand curve for services (Kratochwill & Teixeira, 2024). In several service industries, such as nursing, childcare, and teaching, women comprise most workers. In other service sectors, women are equally well-represented in high-paying positions and leadership responsibilities (Ahmad et al., 2024).

When assessing economic growth, it is crucial to consider women's employment in the service industries, as it is a significant factor. It guarantees gender parity by fostering economic growth. According to the UN Women (2024) report, economic growth and higher productivity can be stimulated through women's employment in the service sector. Employment opportunities for women in the service sector foster the development of new entrepreneurs, creating a more innovative and job-oriented environment. Additionally, Mari et al. (2024) underscored the significance of female entrepreneurs in market development. They demonstrated that greater gender diversity in leadership positions leads to increased productivity and enhanced employment opportunities. The increased participation of women in the service sector reinforces gender equity. Women with specialized skills and education are predominantly employed in the tourism industry, constituting a significant portion of the service sector. According to Rahman et al. (2024); Dikilitas et al. (2022), tourism favors women's employment in the service sector, namely in the hospitality and service industries. Globalization typically fosters the growth of IT industries, which rely on a skilled workforce. Globalization has led to a boom in work prospects for educated women and has also played a role in reducing gender disparities by creating additional possibilities for women. Fazaalloh (2024) explains that FDI has a favorable effect on both economic growth and the development of human capital in developing countries. Utouh and Kitole (2024) argued that education has improved work prospects for women, particularly in the service sector, as education is essential for acquiring the necessary skills and knowledge. Almutairi (2024) has found substantial returns on investment in education. Their research emphasizes that education is a significant factor in women's employment, especially in the service industry.

METHODOLOGY

1. Data and Variables

Table 1 provides an overview of the variables used in this study, detailing their names, short names, descriptions, and sources. The dependent variable, the female labor force in service, is the percentage of female employment in services, modelled by ILO estimates. Independent variables include tourism, globalization, FDI, export, and education. The four variables, tourism, female service in the labor force, FDI, export, and education data, were collected from World Development Indicators (WDI). Globalization data was collected from the KOF Swiss Economic Institute. In this paper, all variables were transformed using the natural logarithm (ln) transformation to normalize the data. The natural log transformation helps address potential non-linearity and heteroskedasticity in the data, stabilizes the time series variance, and makes the relationships between variables more linear. Figure 2 outlines the research process in a step-by-step manner. It starts with the introduction and literature review, progressing through the research aim and framework, study zone, and variable selection. The theoretical background and empirical framework are presented below. It then proceeds to robustness checks and specific country findings, including discussion, conclusion, and policy recommendations. This diagram provides a clear, step-by-step roadmap of the entire research process.

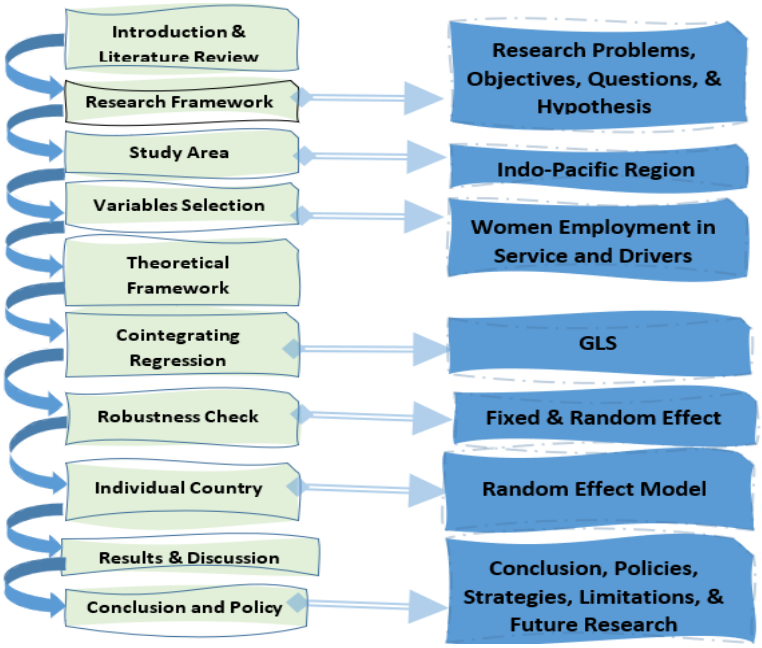


Figure 2. Methodology and Workflow Diagram

In the context of this study, the research utilizes a combination of interpolation and extrapolation techniques to manage missing data. Particularly, the research employed linear interpolation to estimate missing values within the data range, ensuring continuity in the dataset without introducing bias or shock. Extrapolation was used cautiously for data points outside the observed range to extend known patterns while minimizing potential errors. These methods confirmed that our data set remained robust and consistent, and provided a complete basis for further research.

The study examines empirical evidence explicitly about the factors that influence women's employment in the service sector in the Indo-Pacific countries. The model of the relationship between the dependent variable (women's employment in service) and the independent variables (Tourism, Globalization, FDI, Export, and Education) is shown in the following Equation (Voumik et al., 2023):

$$FemServ = f(TOUR, GLOB, FDI, EXP, EDU) \quad (1)$$

Here the variables are denoted by *GLOB*, *TOUR*, *FDI*, *EXP*, and *EDU* that means globalization, tourism, foreign direct investment, exports, and education, respectively. The measurement unit of those selected variables are presented in Table 1.

The theoretical framework representing the relationship is written as follows in Equation (Voumik et al., 2023):

$$FemServ_{it} = \alpha_0 + \alpha_1 TOUR_{it} + \alpha_2 GLOB_{it} + \alpha_3 FDI_{it} + \alpha_4 EXP_{it} + \alpha_5 EDU_{it} + \mu_{it} \quad (2)$$

FemServ indicates female employment in the service sector; *GLOB*, *TOUR*, *FDI*, *EXP*, and *EDU* denote globalization, tourism, foreign direct investment, exports, and education, respectively. Furthermore, α_0 is the constant term, α_{1-5} are coefficients, i illustrates the cross-section units; t is the time dimension, and μ_{it} is the error term.

Table 1. List of variables and sources

Variables Name	Short Name	Measurement Unit Details	Sources
Female Labor Force in Service	FemServ	Employment in services, female (% of female employment) (modelled ILO estimate)	World Development Indicators (WDI)
Tourism	TOUR	International tourism, number of arrivals	WDI
Globalisation	GLOB	KOF Globalisation Index	KOF Swiss Economic Institute
Foreign Direct Investment	FDI	Foreign direct investment, net inflows (BoP, current US$)	WDI
Export	EXP	Exports of goods and services (% of GDP)	WDI
Education	EDU	Government expenditure on education, total (% of GDP)	WDI

Table 2. Summary statistics of the variables

	FemServ	GLOB	TOUR	FDI	EXP	EDU
count	384	384	384	384	384	384
mean	3.958	4.157	15.808	21.946	3.578	1.311
std	0.519	0.204	1.067	4.677	0.764	0.32
median	4.164	4.17	15.614	22.821	3.395	1.282
skewness	-0.984	-1.271	0.876	-4.003	0.604	-0.703
kurtosis	0.013	1.848	0.699	16.314	-0.185	1.952

Table 2 presents the summary statistics for the variables used in this study. The sample consists of 384 observations for each variable. The mean value for the female labor force in service is 3.958, with a standard deviation of 0.519, while

globalization has a mean of 4.157 and a standard deviation of 0.204. Tourism has a mean of 15.808 with a higher variability, indicated by a standard deviation of 1.067. Notably, FDI shows significant variation with a mean of 21.946 and a standard deviation of 4.677. FDI and its distribution are highly skewed, as indicated by the skewness and kurtosis values. All variables show significant p-values for the Jarque-Bera test, indicating non-normal distributions.

2. Econometric framework

Before applying any regression analysis, it is crucial to use a unit root test, as this prevents erroneous conclusions. Unit roots guarantee that all variables are stationary. This study will employ the Augmented Dickey-Fuller (Dickey & Fuller, 1981) and Phillips-Perron test (Phillips & Perron, 1988). According to Dickey & Fuller (1981), the ADF test is more robust and applicable to complex models. Both the ADF test and PP test handle serial correlation. ADF test is formulated in the following Equation (Dickey & Fuller, 1981):

$\Delta Y_{it}=\alpha i + \gamma i Y_{it-1} + \sum_{K=1}^{P} \beta ik\, \Delta\, Y_{it-k}+\varepsilon it$ (3)

Here, t denotes the time series and I denotes cross-section units, ΔY_{it} presents the first difference of the variable, αi is the intercept term, Y_{it-1} is the lag value of the variable, γi is the coefficient of the lag variable, K is arbitrary constant, P is the number of lag, βik is the coefficient of the lag differences and εit is the error term.

The PP equation is constructed in the following Equation (Dickey & Fuller, 1981):

$\Delta Y_{it}=\alpha i + \gamma i Y_{it-1}+\varepsilon it$ (4)

The PP test does not include lagged differences in the dependent variable. Here, t denotes the time series and i denote cross-section units, ΔY_{it} presents the first difference of the variable, αi is the intercept term, Y_{it-1} is the lag value of the variable, γi is the coefficient of the lag variable. After analyzing the unit root test, the research will examine the Johansen Cointegration test to examine the cointegrating relationship among the time series.

After examining the diagnostic tests for unit roots and cointegration, the paper will proceed with the long-run regression analysis. To determine how tourism, globalization, FDI, exports, and education impact women's employment in the service sector, the paper employs GLS regression. GLS is more appropriate because this method deviates from the traditional assumption of homoscedasticity. GLS is a more robust and unbiased estimator because it does not imply either homoscedasticity or autocorrelation (Wooldridge, 2010). The GLS alters the estimation method to account for heteroscedasticity or autocorrelation by transforming the original data or employing weights to the observations. Even if the error terms show heteroscedasticity or serial correlation, then the GLS transformation and adjustment also guarantee unbiased and efficient estimates and ensure the validity of the estimation (Gujarati & Porter, 2009). The GLS regression is explained in the following Equation (Voumik et al., 2023):

$FemServ_{it} = \alpha_0 + \alpha_1 GLOB_{it} + \alpha_2 TOUR_{it} + \alpha_3 FDI_{it} + \alpha_4 EXP_{it} + \alpha_5 EDU_{it} + \mu_{it}$ (5)

FemServ indicates female employment in the service sector, GLOB shows globalisation, TOUR reflects tourism, FDI demonstrates foreign direct investment, EXP indicates exports, and EDU indicates education. Moreover, $\alpha_0$is the constant term, α_{1-5} are coefficients, i illustrates the cross-section units; t is the time dimension, and μ_{it} is the error term. The logarithmic transformation of the variables is demonstrated in the following Equation (Voumik et al., 2023):

$lnFemServ_{it} = \alpha_0 + \alpha_1 lnGLOB_{it} + \alpha_2 lnTOUR_{it} + \alpha_3 lnFDI_{it} + \alpha_4 lnEXP_{it} + \alpha_5 lnEDU_{it} + \mu_{it}$ (6)

According to Majeed and Ozturk (2020) and Siddique and Kiani (2020), the log transformation is a tool for interpreting the coefficients of the variables because it can manage skewed data and nonlinear relationships, making the regression interpretation more efficient and robust. Consequently, panel data econometric models (fixed effect and random effect) are implemented to account for unobserved effects, including country-specific effects. In contrast, a fixed effects model permits a correlation between explanatory factors and the unobserved effect μi for a cross-section and does not make this assumption. Another reason for applying the fixed effect and random effect models exists. The fixed-effects and random-effects frameworks are beneficial for analysing missing data because they allow for linking the missing data to any of the other variables in the model. Wooldridge (2010) uses random and fixed effect models to resolve the potential problem of missing variables in panel data analysis.

Equation by (Wooldridge, 2010) can be used to express the fixed-effects model.

$y_{it} = \alpha_i + \lambda_t + \beta'_{xit} + \mu_{it}$, i= 1, 2……N; t= 1, 2……..T (7)

Where it denotes the time series and cross-section units; y_{it} represents the dependent variable (women employment in the service sector); xit denotes the explanatory variables; the vector of coefficients is denoted by β '; αi represents the individual-specific concept; λt is the period-specific intercept; and $\mu_{it} \sim N(0, \sigma_u^2)$.

The following Equation ((Wooldridge, 2010) expresses the random-effects model:

$y_{it} = \alpha_i + \lambda_t + \beta'_{xit} + \mu_i + \varepsilon_{it}$ i= 1, 2……N; t= 1, 2……..T (8)

Where the measurement unit explain that, individual-specific error component is indicated by μi and $\mu_i \sim N(0, \sigma_u^2)$; the period-specific error component is narrated by λt and $\lambda_t \sim N(0, \sigma_\lambda^2)$; the idiosyncratic error component is illustrated by εit and $\varepsilon_{it} \sim N(0, \sigma_\varepsilon^2)$.

RESULTS ANALYSIS AND DISCUSSIONS

Figure 3 shows the correlation matrix of the variables. The female labor force in service strongly correlates positively with globalization, and the value is 0.79. Export and education also positively correlate with female in service. The correlation value of the female labor force and education is 0.29. Tourism and FDI show negative correlations with female employment, suggesting an inverse relationship. Table 3 presents all independent variables' Variance Inflation Factor (VIF) values. All VIF values are below the common threshold of 10, indicating no severe

multicollinearity in our variables. The highest VIF is observed for globalization at 1.400, while FDI has the lowest at 1.090. The overall VIF and 1/VIF tests suggest low collinearity among the independent variables.

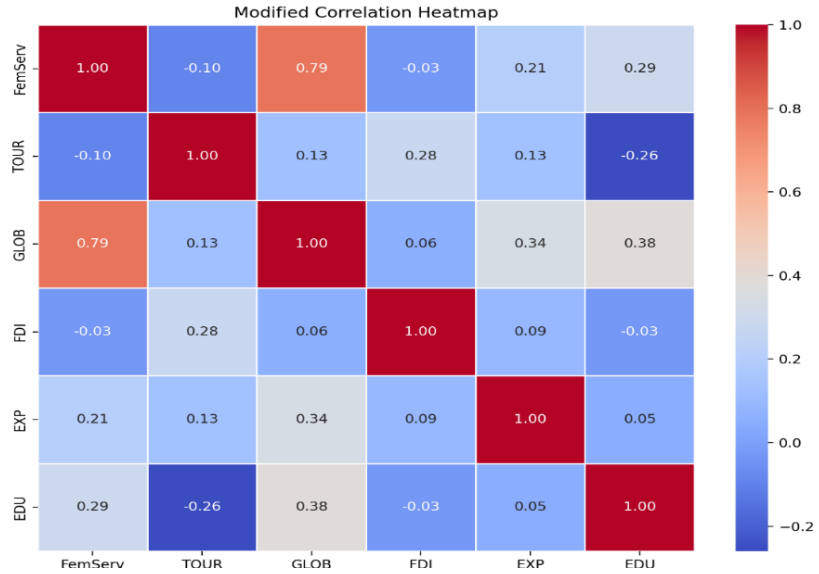


Figure 3. Correlation heatmap of female service employment and economic indicators

Table 3. Multicollinearity tests

Variable	VIF	1/VIF
const	581.368	0.002
TOUR	1.241	0.806
GLOB	1.400	0.714
FDI	1.090	0.917
EXP	1.150	0.870
EDU	1.329	0.752

Table 4. Unit root test (ADF & PP)

Variable	Test	ADF Statistic	ADF p-value	PP Statistic	PP p-value	Critical value (1%)	Critical value (5%)	Critical value (10%)
FemServ	Level	-2.9158	0.0435	0.2848	0.1	-3.4475	-2.8691	-2.5708
	1st Difference	-19.6822	0.001	0.0579	0.1	-3.4476	-2.8691	-2.5708
TOUR	Level	-3.2645	0.0165	0.3845	0.0838	-3.4475	-2.8691	-2.5708
	1st Difference	-18.8417	0.001	0.0516	0.1	-3.4476	-2.8691	-2.5708
GLOB	Level	-4.5851	0.0001	0.1659	0.1	-3.4477	-2.8692	-2.5708
	1st Difference	-9.9798	0.001	0.0174	0.1	-3.4477	-2.8692	-2.5708
FDI	Level	-4.6218	0.0001	0.2926	0.1	-3.448	-2.8693	-2.5709
	1st Difference	-8.0903	0.001	0.0459	0.1	-3.4482	-2.8694	-2.571
EXP	Level	-2.6581	0.0816	1.4796	0.01	-3.4475	-2.8691	-2.5708
	1st Difference	-20.3565	0.001	0.0616	0.1	-3.4476	-2.8691	-2.5708
EDU	Level	-4.2871	0.0005	0.3248	0.1	-3.4476	-2.8692	-2.5708
	1st Difference	-17.9986	0.001	0.0352	0.1	-3.4476	-2.8691	-2.5708

Table 4 presents the results of the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests, respectively. Both tests indicate that all variables, except for exports (EXP), are stationary at the 5% significance level, as their p-values are below 0.05 and their test statistics exceed the critical values. These results suggest that most of the series do not contain a unit root problem and are suitable for regression analysis.

Table 5. Johansen cointegration tests

Variables	Eigenvalues	Trace Statistic	Critical Values (90%)	Critical Values (95%)	Critical Values (99%)
FemServ	0.204586	170.8377	91.109	95.7542	104.9637
TOUR	0.098093	83.40083	65.8202	69.8189	77.8202
GLOB	0.042987	43.9615	44.4929	47.8545	54.6815
FDI	0.038096	27.17704	27.0669	29.7961	35.4628
EXP	0.020179	12.33997	13.4294	15.4943	19.9349
EDU	0.011847	4.552576	2.7055	3.8415	6.6349

The Johansen cointegration test in Table 5 identifies the presence and number of cointegrating relationships among multiple time series. If the trace statistic exceeds the critical values at given significance levels (90%, 95%, 99%), it

indicates the presence of cointegration. It uses eigenvalues and trace statistics to evaluate the null hypothesis of no cointegration against the alternative of at least one cointegrating relationship.

Table 6 demonstrates the fixed and random effect findings to check the robustness. In the fixed and random effects model, tourism, globalization, education, and FDI are significant and positive determinants of female employment in the service sector, with considerable p-values, respectively. A positive coefficient value for variable tourism indicates a positive relationship between women's employment and tourism in the chosen panel group. The coefficient values are 0.037 and 0.340, suggesting that a one per cent rise in tourism leads to a 0.037 and 0.034 per cent increase in women's employment in the service industry. The findings are similar to those of Bolukoglu & Gozukucuk (2024). The tourism industry in Indo-Pacific countries is related to the hospitality, retail, transportation, food, and entertainment sub-sectors, generating more job demand in these sub-sectors. Tourism offers more flexible jobs in these countries, such as part-time and seasonal jobs. Part-time and seasonal jobs are flexible for women in every country.

Furthermore, the coefficient value of variable globalization is positive, indicating a positive relationship between employment and globalization. The coefficients are 0.992 and 1.009, indicating that a one per cent rise in globalization leads to a 0.992 and 1.009 per cent increase in women's employment in the service industry. The results of Hossain et al. (2022), and Ayenagbo (2022) also concluded that globalization enhanced women's employment in different regions. Globalization has increased labor demand across several sub-industries, such as hospitality, information technology, export-import-related sectors, and finance. These sectors provide part-time job options and flexible working circumstances, particularly attracting women. The coefficients of FDI are positive and statistically significant, indicating a positive correlation between women's employment and FDI. An increase in FDI contributes to the rise in women's employment. The research of Nica et al. (2023) and Kucera & Tejani (2014) also highlighted that FDI enhanced women's employment in the service sector, however, as FDI is related to building new industrializations, many job opportunities can be generated.

The positive coefficient value of education indicates a positive correlation between women's employment and education in the chosen panel group. The coefficient values are 0.0476 and 0.0472, indicating that a one per cent increase in schooling contributes to a 0.0476 and 0.0472 per cent rise in women's employment in the service industry. Education is critical to advancing women's abilities and capabilities and acquiring essential information and mastery in service. The education level of women in the Indo-Pacific region is increasing, and their participation in the labor market is increasing (Koch & Kuckertz, 2024). Khan et al. (2024) support that education helps increase women's employment and living standards. Only exports show negative coefficients, meaning that as exports rise, the decrease in women's employment due to lack of skill and expertise that is required by the export-oriented firms and industry.

The null hypothesis of the Hausman test shows that the Random Effects model is appropriate, while the alternative hypothesis suggests that the Fixed Effects model is more suitable. The test statistics are negative (-13.0653), which is unusual and can occur due to small sample sizes or model misspecification. In practice, we typically interpret the absolute value of the test statistics. Based on these results, we fail to reject the null hypothesis. This means that the Random Effects model is preferred over the Fixed Effects model for our data. According to the Hausman test results, the random effect model is preferable. The Random Effects model assumes that the individual-specific effects are uncorrelated with the independent variables, which appears to be the case in our data.

Table 6. Fixed and random effect (Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1)

Variables	**FE**	**RE**
TOUR	0.0373***(0.00969)	0.0340***(0.00977)
GLOB	0.992***(0.0549)	1.009***(0.0550)
FDI	0.00325***(0.00113)	0.00319***(0.00115)
EXP	-0.0515*(0.0271)	-0.0513*(0.0267)
EDU	0.0476*(0.0262)	0.0472*(0.0265)
Constant	-0.706***(0.158)	-0.724***(0.179)
Observations	384	384
R-square	0.721	
Hausman Test		
Test Statistic	Degrees of Freedom	Probability
-13.0653	6	p>0.10

Table 7 demonstrates the long-run estimation findings of the GLS regression. GLS is used to check the robustness of the results. The GLS results match the baseline regression FE and RE findings.

Table 7. GLS regression

	Coefficients	**Std. Error**	**T-Statistic**	**P-Value**
const	-0.724	0.179	-4.052	0.001
TOUR	0.034	0.01	3.479	0.001
GLOB	1.009	0.055	18.337	0.001
FDI	0.003	0.001	2.769	0.006
EXP	-0.051	0.027	-1.919	0.056
EDU	0.047	0.027	1.78	0.076

Table 8. Impacts on individual country (*** p<0.01, ** p<0.05, * p<0.1)

	const	TOUR	GLOB	FDI	EXP	EDU
Australia	3.694***	0.014*	0.009	-0.000	0.141***	0.067
China	-1.042	-0.084**	1.094***	0.091**	-0.250***	0.203*
India	-2.308***	0.370***	0.529**	-0.117***	0.106	-0.156
Indonesia	1.797*	0.005	0.780***	0.001	-0.380***	-0.014
Japan	1.923***	-0.003	0.388***	0.000	0.185***	0.275***
Korea, Rep.	0.712***	-0.009	0.741***	0.016	0.034	0.074
Malaysia	0.258	-0.003	1.045***	0.005	-0.107	-0.108
Philippines	-0.105	0.033*	0.933***	0.007	-0.095**	0.129**
Singapore	1.497***	-0.001	0.341***	0.051***	0.061	-0.123
Thailand	-2.046***	0.258***	-0.052	-0.005*	0.518***	-0.262***
Viet Nam	-0.699***	0.008	0.414**	0.054**	0.272***	0.015
New Zealand	4.078***	0.049***	0.083	-0.001	-0.271***	0.114***

Table 8 illustrates the coefficients of different variables and represents how these variables impact women's employment in the service sector across the Indo-Pacific regions. In Australia, tourism slightly impacts female employment in the service sector, while exports have a more significant positive effect. Globalization, FDI, and education do not significantly impact FemServ statistically. The positive coefficient value of the variable tourism indicates a positive relationship between women's employment and tourism in Australia. The coefficient value is 0.014, suggesting that a one per cent increase in tourism contributes to a 0.014 per cent rise in women's employment in the service industry. The coefficient value of globalization is 0.009, indicating that a one per cent increase in globalization raises 0.009 per cent of women's employment in the service industry. On the other hand, the coefficient value of exports is 0.141, indicating that a one per cent increase in exports raises 0.141 per cent of women's employment in the service industry in Australia.

Conversely, in China, FDI and globalization exhibit notable positive impacts on FemServ, whereas tourism has a slight negative effect. In addition, the coefficient of FDI is 0.091, significant at the 5% level, and the coefficient of education is 0.203, which is important at a 10% level. Export impacts are negative, albeit not statistically significant, and education shows a neutral effect. Indonesia experiences positive impacts from globalization and FDI on FemServ, with significant effects noted for tourism as well. Meanwhile, Japan shows positive impacts from FDI and globalization, with tourism also exerting a positive but minimal influence. South Korea has revealed positive impacts from globalization and FDI, with tourism, exports, and education showing slight positive effects. The coefficient values in South Korea are 0.741, 0.016, -0.009, 0.034, and 0.074, respectively.

The Philippines exhibits significant positive impacts from globalization and tourism on FemServ, with mixed effects from other variables. Singapore experiences positive impacts from FDI and globalization, while tourism and education show minor positive effects. Thailand, Vietnam, and New Zealand each display distinct patterns of impact from these variables on FemServ, reflecting varying economic contexts and policy environments influencing female employment in their service sectors. The positive coefficient value of the variable tourism indicates a positive relationship between women's employment and tourism in Australia. The coefficient value is 0.049, suggesting that a one per cent increase in tourism contributes to a 0.049 per cent rise in women's employment in the service industry. The coefficient value of globalization is 0.083, indicating that a one per cent increase in globalization raises 0.083 per cent of women's employment in the service industry. On the other hand, the coefficient value of education is 0.114, indicating that a one per cent increase in education raises 0.114% cent of women's employment in the service industry in Australia.

CONCLUSION AND RECOMMENDATIONS

Tourism is essential in increasing women's employment in the service sector worldwide, particularly in the Indo-Pacific countries, as tourism plays a crucial role in employment opportunities in the service sector. The main objective of this research is to focus on how tourism, globalization, FDI, exports, and education impact women's employment in the service sector in the selected Indo-Pacific countries. The listed countries are Australia, New Zealand, India, China, Vietnam, Thailand, Malaysia, Indonesia, South Korea, the Philippines, Singapore, and Japan.

By analyzing the data from 1991 to 2022, the research concluded how various social and economic indicators impact women's participation rate in the service sector. For the baseline regression, the researchers used the GLS approach. According to the GLS regression, tourism, globalization, FDI, and education positively impact women's participation in service sectors. As tourism grows, women's job opportunities in the service sector widen.

This research area, making a significant contribution to enhancing employment opportunities for women. The research also employed fixed and random effects models to assess robustness. The robust findings of FE and RE proved the validity of the GLS regression. The study also applied random effects to check a specific country's performance. Tourism has a positive and significant impact on women's employment in the service sectors of Australia, India, Japan, the Philippines, and Thailand. Globalization has had a significant and positive impact on nine countries such as, India, China, Vietnam, Thailand, Malaysia, South Korea, the Philippines, Singapore, and Japan.

At the same time, FDI has a positive effect only on three countries (China, Singapore, and Vietnam). Foreign direct investment (FDI) hinders female employment in the service sector in India and Thailand. Exports increase female employment in Australia, Japan, Thailand, and Vietnam. Education has a positive and significant impact on women's employment in China, Japan, the Philippines, and New Zealand.

Policy Recommendations

The tourism industry has a significant impact on women's employment in the Indo-Pacific countries, making it essential for public authorities to promote women-driven tourism businesses. This can be achieved by granting licenses to organizations encouraging women to take leadership roles and offering incentives such as low-interest credit to women starting businesses in tourism-related sectors. To ensure women participate fully, it is crucial to create safe workplaces, provide dependable transportation, and establish protective measures against workplace harassment. Additionally, globalization positively affects women's employment, and policymakers should foster platforms for women entrepreneurs in international markets. It is important to enforce fair trade regulations that guarantee equal pay for women and ensure that multinational companies adhere to gender equality principles.

FDI plays a crucial role in boosting women's employment, especially in retail, healthcare, and hospitality industries. Governments should offer tax incentives to attract FDI into these sectors while ensuring that women's rights are protected through strict labor laws. Similarly, while exports have shown a minimal positive impact on women's employment in the service sector, policies should promote women's participation in export-led industries, particularly textiles and education services. Education is key to expanding opportunities for women, especially in science, technology, engineering, and mathematics (STEM), where countries like Japan and Singapore have already made significant progress. Public authorities must prioritize STEM education and improve literacy rates for women to enhance their involvement in the service sector.

Limitations and Future Research

This study needs more data for specific countries and years. Future data should address the data limitations by filling in the gaps in missing data. Additionally, the research is based on secondary data, which may limit the depth of understanding of local demographic, cultural, social, and policy influences on women's employment. This study considered significant factors such as tourism, globalization, FDI, exports, and education to measure the impact on women's employment in the service sector of Indo-Pacific countries.

Further study may consider other factors, such as technological innovation, urbanization, and uncertainty, such as political, economic and natural disasters. The research focused on the Indo-Pacific region, but there is an opportunity to research other panel groups such as N-11, D-8, G-7, and others. Future researchers will also examine how similar variables affect women's employment in different continents, such as Latin America, Europe, and Africa.

Appendix A. List of Countries

Australia, New Zealand, India, China, Vietnam, Thailand, Malaysia, Indonesia, South Korea, Philippines, Singapore, and Japan

Appendix B. List of Abbreviations

Abbreviations	Details
ADB	Asian Development Bank
ADF	Augmented Dickey-Fuller
ASEAN	Association of Southeast Asian Nations
BRICS	Brazil, Russia, India, China, and South Africa
BPO	Business process outsourcing
FDI	Foreign Direct Investment
G 7	Group Seven
GLS	*Generalised Least Squares*
GDP	Gross Domestic Product
IT	Information Technology
ILO	International Labour Organisation
PP	Phillips-Perron
N-11	*Next Eleven Countries*
OECD	*Organisation for Economic Co-operation and Development*
SAARC	*South Asian Association for Regional Cooperation*
UNCTAD	United Nations Conference on Trade and Development
UN	United Nations
VIF	Variance Inflation Factor
WDI	World Development Indicators

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PERCEPTIONS OF TOURISM IMPACTS AND COMMUNITY RESILIENCE TO NATURAL DISASTERS IN TANGUARHAOR, SUNAMGANJ

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Abstract: Tourism contributes to economic growth and social development. It also poses challenges to disaster-prone regions. The tourism sector in Bangladesh, particularly Sylhet region, is rapidly growing. This study examines residents' perceptions of tourism's impact and its relationship with community resilience in Tanguar Haor, Sunamganj and explores how does tourism influence on economic opportunities, social cohesion, and environmental sustainability while assessing the community's ability to adapt to natural disasters. In this study, a mixed-method approach was used, incorporating surveys and interviews with 360 residents from Tahirpur and Dharmapasha upazilas (an administrative unit). The data collected from the survey was systematically encoded, processed, and analyzed using SPSS version 25.0 to ensure accuracy and reliability. The study indicate that tourism positively impacts the local economy by generating employment and improving infrastructure, yet it also exacerbates economic inequality. While tourism promotes cultural activities and environmental awareness, residents expressed concerns about cultural erosion, social issues, and ecological degradation. Statistical analysis revealed a strong correlation between tourism's environmental impact and community attachment ($r = 0.975$, $p < 0.01$), suggesting that positive environmental perceptions enhance community ties. Additionally, economic benefits from tourism were significantly linked to adaptive response ($r = 0.755$, $p < 0.05$), indicating that tourism-driven economic stability improves disaster preparedness. However, economic gains were also associated with heightened environmental fragility ($r = 0.749$). The study highlights the need for sustainable tourism policies that integrate disaster risk reduction strategies, ensuring a balance between economic benefits and community resilience for long-term sustainability in vulnerable regions.

Keywords: perception, tourism impact, community resilience, natural disaster, community attachment, disaster prevention, adaptive response

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INTRODUCTION

Tourism is defined as the practice of individuals journeying to and residing in locations beyond their habitual surroundings for recreational, professional, or alternative motives (Tribe, 2009). The phenomenon of tourism is a highly complex one. Due to its nature, it carries significant ramifications in various domains such as social, political, cultural, and economic activities (Gössling et al., 2013). It can offer vital financial support, facilitating recovery in communities after calamities. Sustainable tourism practices may improve local economies while promoting resilience (Zapanti & Constantina, 2024). It generates substantial foreign exchange earnings for many nations while promoting growth through job creation and business creation. Infrastructure improvements, the conservation of the environment and cultural heritage, and the reduction of poverty and inequality are all made possible by this industry (Best & González, 2021a).

Nowadays, it is acknowledged that tourism is a significant global economic activity. It needs economic, social, cultural, and environmental involvement. The tourism support more than 70 million people directly (Bott, 2023; Lickorish & Jenkins, 2007). The World Travel and Tourism Council Annual Updates state that travel and tourism directly boosted the world economy in 2012 by creating 101 million jobs and contributing US$ 2.1 trillion (Parveen, 2013; Rahman et al., 2010). About 5% of the global gross domestic product (GDP) is generated by tourism, making it the fourth largest economic sector after food, chemicals, and fuels (Aramberri, 2009). It undoubtedly stands as one of the most significant social and economic phenomena in contemporary society. According to Bofulin et al. (2016) tourism in developed countries has evolved significantly over time. Tourism in these nations was initially limited to the wealthy. Touring became more affordable for the middle class as transportation improved, especially with railways in the 19th century. (Jenkins, 1980; Yfantidou & Matarazzo, 2017). This led to the development of tourist destinations such as seaside resorts, national parks, and historic landmarks, which catered to the growing demand for leisure travel.Tourism is seen as one of the key pillars of economic development for numerous developing countries, especially those that are least developed (Parveen, 2013).

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Gössling (2000), finds in his study that for many poor nations, especially small island governments, tourism is a major source of income. Sadler & Archer (1975) concluded that just a small minority of developing nations rely primarily on tourism. It gives people the chance to earn foreign currency and build a source of income. Furthermore, developing economies are currently requiring better infrastructure due to the rise of tourism. The global tourism sector is highly vulnerable to environmental hazards and has faced significant impacts from recent crises and disasters (Aliperti et al., 2019). Many tourist destinations rely on natural features such as beaches, mountains, forests, and biodiversity, which attract visitors but are often prone to natural disasters (Hall & Gössling, 2006). Due to its exposure to natural and man-made risks, the tourism industry has suffered extensive damage over the past decades, emphasizing the need for resilience (Pforr & Hosie, 2008). Building resilience involves addressing gradual and abrupt changes through stability, response, and adaptation (Prayag, 2018). Socio-ecological resilience is vital for sustainable tourism development, particularly in resource-dependent areas prone to natural disasters (Cohen, 1978; Ruiz-Ballesteros, 2011). Incorporating resilience into tourism planning enhances sustainability and ensures better disaster management (Gössling, 2000). By embedding disaster management principles into destination strategies, tourism areas can better withstand and recover from natural calamities (Filimonau & De Coteau, 2020).

The literature extensively documents the impacts of tourism, with studies by Alcoriza & Policarpio (2023), Best & González (2021), Liu et al. (1987), Prentice (1993), Cecil et al. (2010) and Tsai et al. (2016) highlighting positive effects such as increased business activities, higher income, and contributions to local culture. However, less attention has been given to benefits like increased opportunities for selling local agricultural products and enhancing the area's image, which residents of disaster-prone regions greatly value. These benefits play a significant role in accelerating recovery efforts (Zhang et al., 2024). In a study Clark et al. (2024) applied human ecology theory to examine community resilience and adaptive capacity in nature-based tourism destinations, highlighting the importance of sustainable practices and community engagement in mitigating environmental hazards. Similarly, research on tourism community responses to the COVID-19 pandemic introduced the Tourism Community Resilience Model, emphasizing the need for diversified economic activities and robust health infrastructures to withstand global crises (Praptika et al., 2024). However, community perceptions are not static, and these perceptions may change over time (Halim et al., 2022), depending on the individual location, societal standards, rules and traditions (Stoffelen & Ioannides, 2022). For that reason, community perception is always a key issue in tourism development due to the dynamism in the relationship between tourism and community people. Bangladesh, a developing nation, is rich in scenic beauty, featuring rivers, beaches, hills, forests, waterfalls, historical sites, and tea gardens. These attractions draw numerous local and foreign visitors annually (Roy & Roy, 2015). The tourism sector contributes 3% of the country's GDP, supporting approximately 1.3 million jobs, both directly and indirectly. Despite its potential, Bangladesh has yet to fully capitalize on its tourism opportunities. The nation is home to several unique attractions, including the Sundarbans, Cox's Bazar, the Royal Bengal Tiger, the Rangamati highlands, and the Sylhet tea gardens (Alauddin et al., 2014). However, the underdeveloped tourism industry limits its growth and revenue potential (Parveen, 2013).

Tourism in Sylhet is growing faster in Bangladesh. It is known for its tea plantations, tropical forests, unique tribal populations, natural water falls, and lakes with crystal-clear water surrounded by lush hills, haors, etc. TanguarHaor is a large wetlands habitat in Tahirpur, Sunamganj District, Bangladesh, and one of the most important in South Asia. It is known worldwide for its position, size, biodiversity, flora and fauna, heart of migrating birds, and economic importance as one of the most beautiful bodies of water (Muneem & Avi., 2017). The Meghalaya mountains in the distance, the glistening springs and rivers, the innumerable birds, and the spectacular splendor of the Koroch-Hijol forest are some of the reasons TanguarHaor is such a popular tourist destination. The area’s tourism-driven economy employs about 50,000 people overall (Sultana, 2016). Bangladesh's tourism sector faces numerous challenges, including inadequate communication and transportation infrastructure, poorly planned lodging, dining, and entertainment optionsthat serve a variety of tourist types (Rahman et al., 2010). But the people live in this area often experience different natural calamities including flash floods, cyclone and tidal Surge, heavy Rainfall, river erosion, thunderstorms as a regular basis (Khan et al., 2021).

This poses enormous threat to the vulnerable community of this region. For reducing the risk of disaster, the resident developed many disasters prevention measure and adaptive response to mitigate the disaster risk to the community (Ara & Islam, 2019; Ranjan & Abenayake, 2014). A recent study focuses on local community perceptions of tourism impacts in Sylhet, Bangladesh, highlighting positive views towards future tourism development (Halim et al., 2022). Another study emphasizes on community-based adaptation initiatives and strategies (Mahmud, 2023). However, these studies did not specifically address community resilience to natural disasters. Tourism in disaster-prone areas presents unique challenges, particularly in regions like TaguarHaor (Rahaman et al., 2016), where frequent flooding and natural disasters threaten tourism-dependent economies. While many studies have examined community perceptions of tourism impacts and responses to natural disasters, gaps remain in understanding the interplay between tourism and community resilience in such vulnerable areas.

This study aims to critically assess residents' perceptions of tourism's economic, socio-cultural, and environmental impacts in Tanguar Haor, Sunamganj, Bangladesh. It seeks to analyze how these perceptions influence community resilience and adaptive capacities in the face of natural disasters. The main objectives of this research are a) to explore residents' perceptions of tourism's social, economic, and environmental impacts and b) to understand the relationships between tourism perceptions and community resilience. By providing insights into these dynamics, the research aims to inform sustainable tourism planning and resilience strategies to address contemporary weather and climate challenges effectively.

2. Study Area

TanguarHaor, located in northeastern Bangladesh, is a Ramsar-designated wetland of national and international significance (Ara & Islam, 2019). Spanning approximately 9,727 hectares, it lies within the Surma-Kushiyara river

basins and is geographically positioned between 25.1615° N and 91.0778° E (Figure 1). Declared an Ecologically Critical Area in 1999 due to overexploitation (Ara & Islam, 2019; Raihan & Hossain, 2021).

Administratively, TanguarHaor is divided between Dharmapasha and Tahirpur sub-districts. Two-thirds of the area lies in Dharmapasha, while Tahirpur hosts one-third, including most tourist attractions, which draw higher population densities (Sultana et al., 2022). The socio-demographic profile of TanguarHaor reflects significant challenges. Approximately 60,000 people across 10,000 households depend on the wetland for their livelihoods (Sultana et al., 2022). Residents engage in agriculture, fishing, and secondary activities like duck farming and bamboo trading, demonstrating their dependence on the wetland's resources. Ecologically, TanguarHaor supports 141 fish species, rare wetland trees like *Barringtonia acutangula*, and hosts 200 bird species annually (Alam, 2012).

Residents of TanguarHaor are afflicted by three categories of inundation during the rainy season.Addressing these challenges is critical to ensuring the long-term resilience of this ecologically and economically significant region.

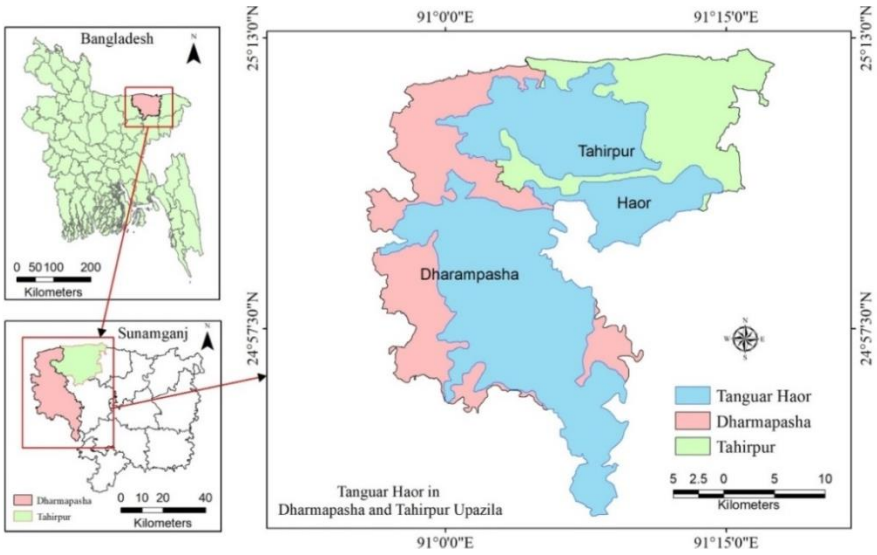


Figure1. Location of TanguarHaor

METHODOLOGY

1. Data collection

Primary data were used to conduct the study. Some secondary data were also used for better analysis and interpretation of the study and also for the preparation of the questionnaire. Individual respondent surveys, in-person field trips, interviews, and observation were used to gather the primary data.

2. Questionnaire

A semi-structured questionnaire was designed to collect data from respondents in the Haor region. The questionnaire was organized into three sections (Figure 2). Part 1 focused on the socioeconomic profile of respondents. Part 2 examined perceptions of tourism impacts. Part 3 addressed community disaster resilience, categorized into four dimensions: environmental fragility, community attachment, disaster prevention awareness, and adaptive response. The questionnaire primarily featured closed-ended questions with predefined response options. A five-point Likert scale, with 1 denoting "strongly disagree" and 5 denoting "strongly agree," was used to gauge perceptions of the effects of tourism and community resilience.

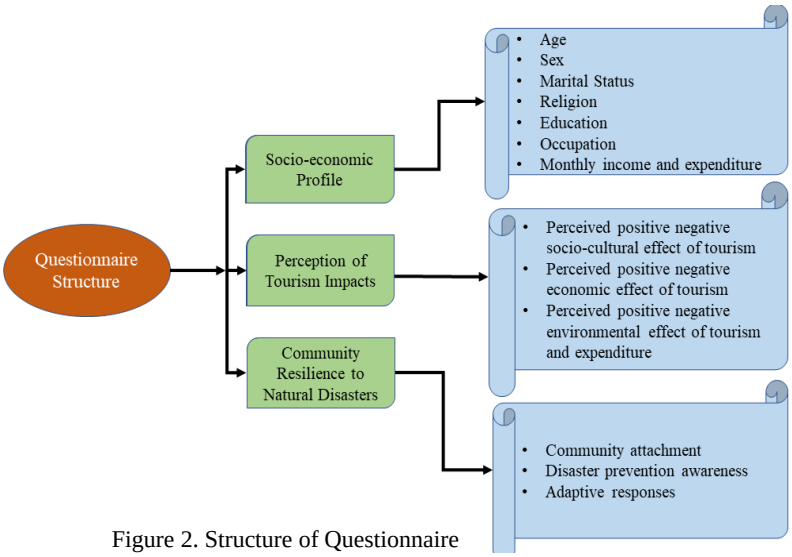


Figure 2. Structure of Questionnaire

3. Sample size calculation

In order to determine the sample size from a population, Yamane (1967) proposed an additional simplified formula. The formula is: $n = N/(1 + Ne^2)$

Where N = Known population size; e = margin of error

For this study, a 95% confidence interval was used to describe a 5% margin of error. After removing incomplete questionnaires, a total of 360 questionnaires were used to collect data from the respondents. The questionnaires were then divided equally to collect data from the two upazilas of TanguarHaor.

4. Selection of Respondents

The respondent was selected from the selected village and the age of the respondent was above 18. Both men and women participate in questionnaire survey and the people who were working in tourism sector was preferred. 180 of respondents from each village (Tahirpur and Dharmapasha) were selected randomly.

5. Secondary Data

Secondary data was needed in this study to identify the research gap, selection of affected community, formulation of questionnaire, methodology and study area map creation etc. Secondary data was gathered from Wikipedia, newspapers, and other publications.

6. Analyzing and Processing Data

The IBM Corporation's Statistical Package for the Social Sciences (SPSS) software, version 25, Word, and Microsoft Excel were used to process and analyze the gathered data independently. The text, tables, and graphs all included the data that had been analyzed. To understand the respondents' opinion towards the socioeconomic status, perception of tourism impact and community resilience different analytical processes, normal frequency (n) and percentage (%) distribution and mean and standard deviation are calculated. To discover if different perceptions exist regarding tourism impact and community resilience among the upazila, t-test was conducted. To explore the relationship between perceptions of tourism impact and community resilience, a correlation was conducted using SPSS.

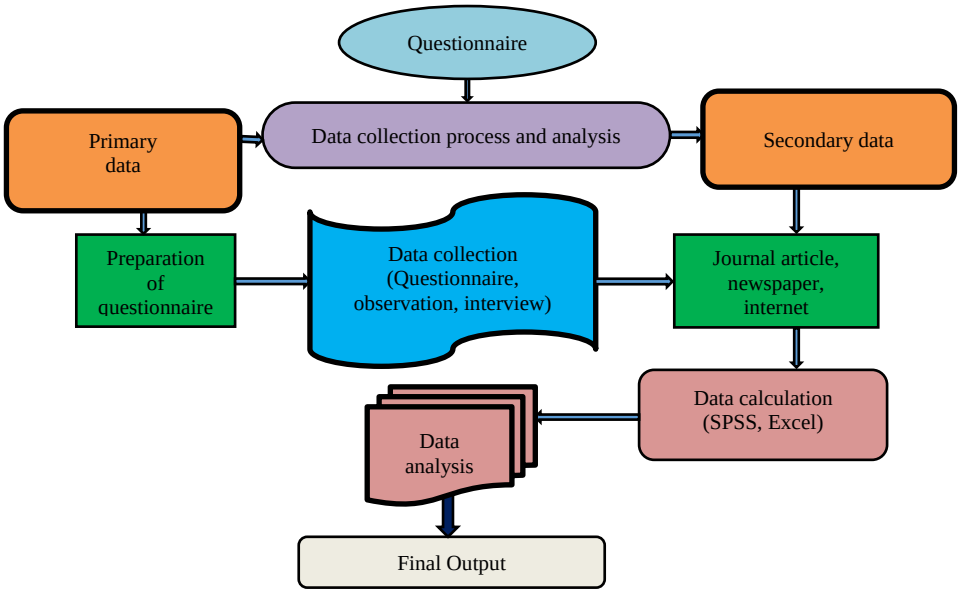


Figure 3. Flow chart of the study

The flowchart (Figure 3) summarizes the overall process of the study. The research was started with problem identification and according to problems study area was selected. After that the sample size was determined and according to the sample size the questionnaire was made with the help of secondary information. Again, the obtained data was calculated via different means and then the data was analyzed and then the final output is presented in this paper.

RESULTS

1. Participants' demographic characteristics

A total of 360 respondents participated in the survey, with 41.1% in the 28–37 age group, and a significant decline in representation for the 38+ age group. In terms of gender, 72.2% were male and 27.8% were female (Figure 4). Regarding income, 33.6% earned between BDT 7,000-9,000, and only 1.1% earned BDT 13,000-15,000, which is significantly below the national average of BDT 26,000. Many respondents live in poverty, with annual flooding exacerbating their challenges. The largest occupational group was housewives (18.1%), followed by day laborers (12.5%), farmers (11.9%), boatmen (11.7%), and fishermen (11.1%). Smaller groups included small business owners (8.1%), tourist guides (7.5%), and singers (4.7%). Approximately 33.1% of the population is involved in tourism-related activities, primarily as boatmen, tourist guides, or in small businesses. A notable portion (7.2%) is unemployed.

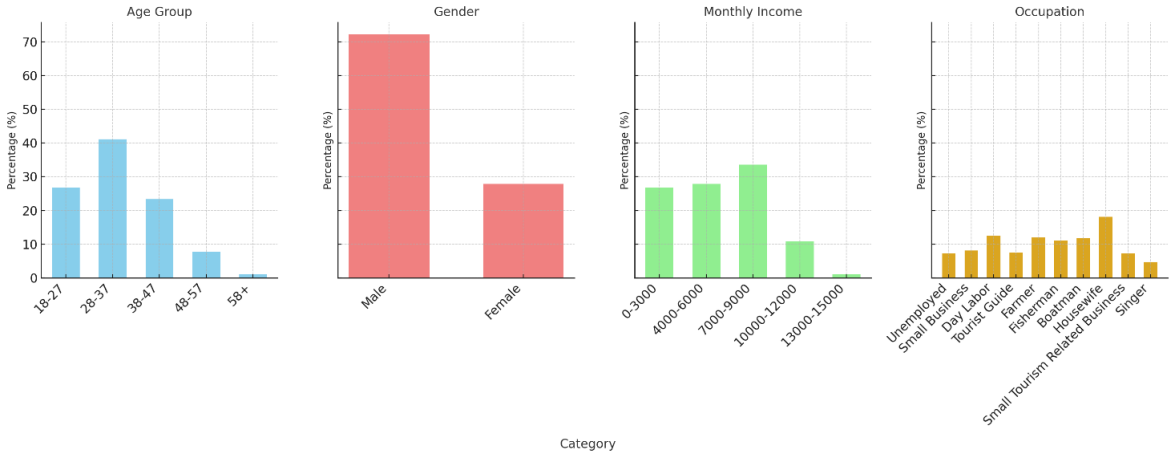


Figure 4. Demographic and Economic Distribution of Respondents

2. Perception of Tourism Impact in TahirpurUpazila

Approximately forty years ago, tourism scholars began to focus on economic, social, and environmental issues (Islam, 2015).Tourism has a wide and varied social influence that is linked with other tourism-related effects. The economy and tourism are interconnected; tourism has been the primary driver of regional development and stimulates startups.

Table 1. Residents Perception of Tourism Impact in TahirpurUpazila (Source: Field Survey, 2024)

Items	Strongly agreed		%		Strongly disagreed	Mean	SD
Perceived Socio-cultural impact of Tourism							
1. It ensure the development of cultural activities	7.8	47.8	26.1	13.3	5.0	3.40	.984
2. It increase the quality of life of the local people	23.9	62.2	10.0	2.8	1.1	4.05	.742
3. Local image and popularity promote	28.3	54.4	12.8	2.8	1.7	4.05	.821
4. It negatively affect the attitude and behaviors of local people	11.7	55.6	20.0	9.4	3.3	3.63	.928
5. It cause the cultural value to disappear	8.6	56.3	17.4	8.0	9.7	3.63	.940
6. Cause social problem such as crime, Prostitution, drugs and vandalism	10.6	50.0	25.6	10.0	3.8	3.53	.950
7. Tourist flow annoy residents and cause stress	16.1	40.0	23.3	10.6	10.0	3.42	1.176
Perceived Economic impact of Tourism							
1. It create new job opportunity for local people	3.9	69.4	20.0	3.3	3.3	3.67	.754
2. It improve the overall quality of life of the resident	31.7	42.2	20.0	3.3	2.8	3.97	.951
3. Investment, Development and Public Construction will improve	15.0	57.8	20.0	5.0	2.2	3.78	.841
4. It increase the consumption of local product and service	14.4	50.6	29.4	4.4	1.1	3.73	.804
5. Due to tourism amenities, different type of product and services are better available	12.2	53.3	25.0	7.2	2.2	3.66	.866
6. Torism support the education and vocational; training	8.3	47.2	28.3	13.9	2.2	3.46	.911
7. It create economic inequalities among local people	30.0	32.2	19.4	11.7	6.7	3.67	1.20
Perceived Environmental impact of Tourism							
1. Tourism support the protection and development of the natural environment and historical structure	9.4	57.8	25.6	4.4	2.8	3.67	.819
2. It improves in Env. quality for future generation	33.3	47.2	15.0	2.8	1.7	4.08	.862
3. Increase environmental awareness	20.0	48.9	22.8	7.2	1.1	3.79	.882
4. Tourism cause pollution of Env. components	13.9	44.4	25.0	13.3	3.3	3.52	1.00
5. The increase number of tourists result disturbance and destruction of flora fauna	12.2	39.4	26.1	15.0	7.2	3.34	1.10
6. Create problem such as crowding, noise, traffic congestion	9.4	30.0	23.3	22.2	15.0	2.97	1.228

5=Strongly agree, 4=Agree, 3=Neutral, 2=Disagree,1=Strongly Disagree

Residents perceived both positive and negative impacts. Most agreed that tourism increased the local quality of life (62.2%) with a high mean score of 4.05 (see table 1). Other positive aspects included the development of cultural activities and the promotion of local image, with mean scores above 3.4. However, negative impacts were also noted. The highest percentage (58.3%) of respondents felt that tourism led to the disappearance of cultural values, due to cultural mixing. Additionally, 55.6% believed tourism negatively affected local attitudes and behaviors, and 50% cited social problems like crime and vandalism. Tourism was viewed positively in terms of economic development. A significant 69.4% agreed that tourism created new job opportunities. The highest mean score for economic impact (3.97) was associated with improvements in the overall quality of life due to better healthcare, public spaces, and recreational opportunities.

However, economic inequalities were noted, with 30% of respondents strongly agreeing that tourism exacerbated disparities. Standard deviations for some items, such as economic inequalities (1.20), indicated a higher variation in responses. Tourism's environmental effects were mixed. While 33.3% (Figure 5) felt tourism improved environmental quality for future generations, concerns were also raised about pollution, the disturbance of flora and fauna, and traffic

congestion. Respondents also agreed that tourism increased environmental awareness (48.9%). However, the negative environmental impacts, such as pollution and crowding, had a high variability in responses.

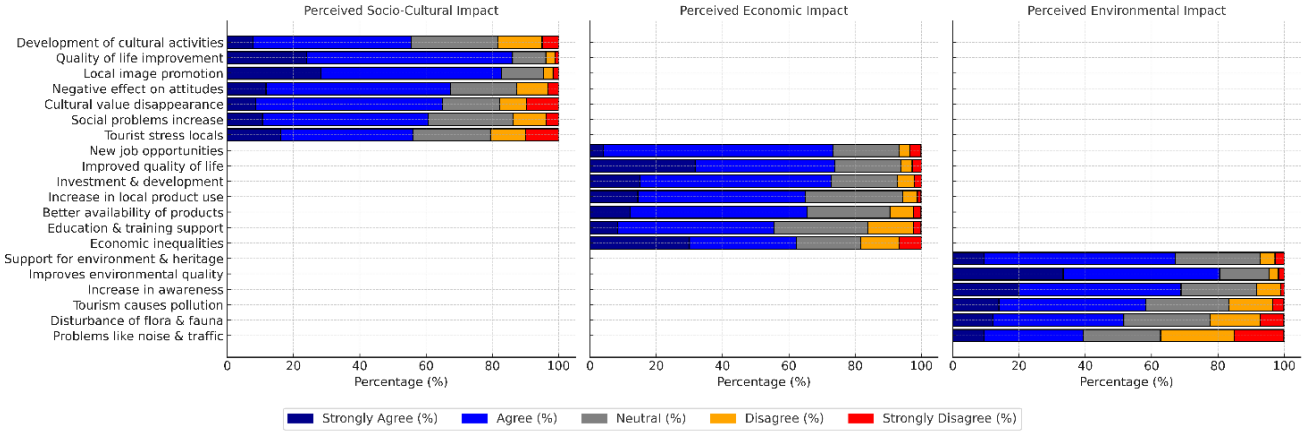


Figure 5. Perceptions of the socio-cultural, economic, and environmental impacts of tourismin TahirpurUpazila

3. Perception of Tourism Impact in DharmapashaUpazila

Dharmapasha is another Upazila of Sunamganj district. Tahirpur and Dharmapasha are adjacent upazila that's why data was collected from those two upazila to compare the Tourism perception among residents.

Table 2 presents the residents' perceptions of tourism's socio-cultural, economic, and environmental impacts in DharmapashaUpazila. Respondents generally perceived tourism positively, with the highest mean score of 4.01 for the improvement of local residents' quality of life, suggesting significant agreement.

However, there were concerns about negative effects, such as tourism's impact on local attitudes and behaviors (mean score 3.62) and the potential disappearance of cultural values (mean score 3.86). Despite the positive impacts on cultural and local image promotion, a sizable portion of respondents expressed concerns about tourism-induced social issues like crime, prostitution, and stress from tourist flow, though these perceptions were somewhat neutral.

The economic benefits of tourism were more strongly acknowledged. A majority (64.4%) (Figure 6) of respondents agreed that tourism created new job opportunities (mean score 3.83). Tourism was also seen as improving the overall quality of life (mean score 4.06), with the lowest variability in responses. Investment, public construction, and consumption of local products were all perceived positively, with mean scores above 3.7. However, economic inequalities were a concern for 31.1% of respondents, showing a moderate impact on income distribution (mean score 3.74).

Table 2. Residents Perception of Tourism Impact in DharmapashaUpazila (Source: Field Survey, 2024)

Items	Strongly agreed		%		Strongly disagreed	Mean	SD
Perceived Socio-cultural impact of Tourism							
1. It ensure the development of cultural activities	10.0	45.6	28.9	11.7	3.9	3.46	0.959
2. It increase the quality of life of the local people	23.9	61.7	8.3	3.9	2.2	4.01	0.825
3. Local image and popularity promote	28.9	51.7	13.3	2.8	3.3	4.00	0.915
4. It negatively affect the attitude and behaviors of local people	13.3	48.3	27.8	8.3	2.2	3.62	0.894
5. It cause the cultural value to disappear	10	57.8	21.7	6.7	3.9	3.86	3.21
6. Cause social problem such as crime, Prostitution, drugs and vandalism	13.9	43.3	24.4	12.2	6.1	3.47	1.070
7.Tourist flow annoy residents and cause stress	16.1	35.6	17.2	15.6	15.6	3.21	1.320
Perceived Economic impact of Tourism							
1. It create new job opportunity for local people	13.9	64.4	16.1	2.2	3.3	3.83	0.815
2. It improve the overall quality of life of the resident	30.0	50.0	16.7	2.8	0.6	4.06	0.792
3. Investment, Development and Public Construction will improve	21.7	56.7	18.9	1.7	1.1	3.96	0.758
4. It increase the consumption of local product and service	20.6	48.9	25.0	3.9	1.7	3.83	0.858
5. Due to tourism amenities, different type of product and services are better available	15.6	50.0	22.8	8.9	2.3	3.93	3.215
6. Torism support the education and vocational; training	15.0	45.0	23.3	12.2	4.4	3.54	1.032
7. It create economic inequalities among local people	31.1	33.9	20.6	7.2	7.2	3.74	1.182
Perceived Environmental impact of Tourism							
1. Tourism support the protection and development of the natural environment and historical structure	10.0	56.9	19.4	8.5	5.2	3.75	.783
2. It improves in Env. quality for future generation	27.8	51.1	16.7	2.8	1.7	4.01	.842
3. Increase environmental awareness	25.0	52.2	18.9	2.8	1.1	3.97	.808
4. Tourism cause pollution of Env. components	17.8	47.8	24.4	8.9	1.1	3.72	0.897
5. The increase number of tourists result I disturbance and destruction of flora fauna	11.1	42.8	22.8	17.8	5.6	3.36	1.072
6. Create problem such as crowding, noise, traffic congestion	8.3	32.2	21.7	23.3	14.4	2.97	1.214

5=Strongly agree, 4=Agree, 3=Neutral,2=Disagree,1=Strongly Disagree

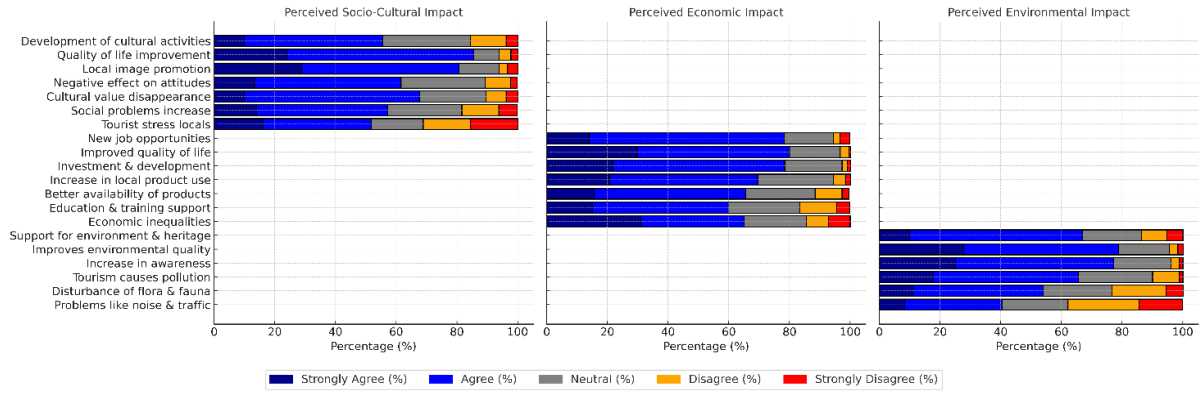


Figure 6. Perceptions of the socio-cultural, economic, and environmental impacts of tourism in DharmapashaUpazila

On the environmental front, positive perceptions included tourism's support for the protection of natural and historical structures (mean score 3.75) and its role in improving environmental quality for future generations (mean score 4.01). Despite these benefits, respondents were concerned about pollution (mean score 3.72) and the potential damage to local flora and fauna (mean score 3.36). Overall, while Dharmapasha residents recognized both the positive and negative impacts of tourism, the overall perception was largely balanced, with stronger agreement on its positive economic and quality of life improvements, alongside concerns about socio-cultural and environmental challenges.

4. Comparison of perception of the residents towards tourism impact between two upazila of Tanguarhaor

As mentioned above, data was collected from two upazilas, namely Tahirpur and Dharmapasha to compare their tourism perceptions between the residents of those two upazilas. Residents of those TanguarHaorupazilas' perceptions of the social, economic, and environmental effects of tourism were compared using an independent sample t test.

The comparison of mean perception scores of tourisms impacts between Tahirpur and Dharmapasha Upazilas reveals that Tahirpur had a mean score of 3.651 (SD = 0.27083), while Dharmapasha scored slightly higher at 3.715 (SD = 0.29874). The Levene's test for equality of variance produced an F value of 0.551 with a significance level of 0.462 (Table 3), indicating no significant difference in variability between the two upazilas.

Table 3. Independent sample test (tourism impacts) (Source: Field Survey, 2024)

				Levene's Test for Equality of Variance		t test for equality of means			95% Confidence Interval of the Difference	
Upazila	N	Mean	SD	F	sig	t	df	Sig. (2-tailed)	Lower	upper
Tahirpur	180	3.6510	.27083	.551	.462	-.710	38	.482	-.24653	.1185
Dharmapsha	180	3.7150	.29874							

5. Community resilience to natural disaster

The concept of resilience is becoming significant in national and international initiatives aimed at enhancing individual and community abilities to prepare for and respond to disasters.

Table 4. Environmental Fragility (Source: Field Survey, 2024)

Items	Strongly agree	%			Strongly Disagree	Mean	Std.
1. This community's land use rate has increased due to tourism development.	33.7	48.9	16.4	2.8	0.3	4.09	0.781
2. The community is situated in a unique topography	30.3	58.6	8.3	2.2	0.6	4.16	0.708
3. The community is located in a disaster-prone area.	27.2	56.4	13.1	2.5	0.8	4.06	0.758
4. The community has a large number of vulnerable group (child less than 6 years, women, older than 60 years)	28.6	57.2	10.3	2.5	1.4	4.20	2.194

5=Strongly agree.4=Agree.3=Nutral,2=Disagree,1=Strongly Disagree

5.1. Environmental Fragility

Fragility denotes that minor hit result in significant harm. Here the environmental fragility indicator of community resilience consists of four items to assessed the environmental fragility of TanguarHaor. Community resilience to disasters is strongly influenced by environmental fragility, as shown by statistics in Table 4, which examines resilience indicators in Tanguar.The community reported a significant increase in land use due to tourism, with 33.7% strongly agreeing and 48.9% agreeing, resulting in a mean score of 4.09 and a standard deviation of 0.781, indicating relatively low variability. The item "community situated in a unique topography" received a mean score of 4.16, with 58.6% agreeing, as residents perceive their low-lying location makes them prone to annual flooding.

5.2. Community attachment

Community attachment in TanguarHaor reflects strong ties and positive attitudes, with 58.3% of respondents highly valuing their community and a mean satisfaction score of 4.10. A majority (56.7%) showed willingness to engage in

disaster prevention activities, with a mean score of 3.90, emphasizing collective well-being. For disaster preparedness, 78.6% agreed to participate in community exercises, achieving a mean score of 3.97, though 16.4% were neutral, suggesting weaker ties for some. In disaster response, 56.7% were willing to assist vulnerable individuals, with a mean score of 3.84, indicating moderate agreement but varying levels of engagement.

6. Relationships between perception of tourism impact and community resilience

The impact of tourism is defined by three dimensions: economic, sociocultural, and environmental, comprising a total of 20 items. Community resilience has four dimensions: environmental fragility, community attachment, disaster prevention awareness, and adaptive responses, total 24 items. The average score of elements was computed to represent each dimension. Correlation analyses were employed to examine the links between perceptions of tourism impact and the aspects of community catastrophe resilience. The correlation analysis in TanguarHaor reveals a positive relationship between tourism impacts and community resilience (Table 5). Stronger environmental impacts from tourism significantly correlate with higher community attachment ($r = 0.975^{**}$, $p < 0.01$), as positive perceptions of environmental improvements foster emotional ties. Disaster prevention awareness shows a positive correlation with sociocultural ($r = 0.777^{*}$, $p = 0.05$) and economic impacts ($r = 0.814^{*}$, $p = 0.05$), where perceived benefits like cultural enhancement and economic opportunities align with increased disaster preparedness. Economic impacts also positively correlate with adaptive responses ($r = 0.755$, $p < 0.05$), reflecting tourism's role in enhancing adaptability. However, stronger economic impacts are linked to higher environmental fragility, indicating vulnerability. Additionally, positive perceptions of tourism's environmental impacts correlate with greater environmental resilience ($r = 0.649$), underscoring the need to mitigate negative impacts to strengthen overall resilience.

Table 5. Relationships between perception of tourism impact and community resilience

Community Resilience	**Perceived Tourism Impacts**		
	Socio Cultural	Economic	Environmental
Environmental Fragility	.495	.749	.649
Community Attachment	.608	.180	.975**
Disaster Prevention Awareness	.777*	.814*	.486
Adaptive Response	.744	.755*	.485

* Correlation is significant at the 0.05 level (2-tailed)**; significant at the 0.01 level (2-tailed)

DISCUSSION

Extreme climatic events pose significant challenges for residents of scenic tourism areas. Tourism perceptions and community resilience in TanguarHaor, is examined in this study. Residents recognize tourism's pros and cons. They mention economic and social benefits include increased local agricultural product sales, new jobs, and regional awareness and popularity. The area's commercial potential has increased due to tourism demand for hotels, restaurants, food, handicrafts, and other local products. Residents also like having more access to rare amenities, products, and services.Beyond socio-cultural and economic benefits, communities see improved environmental quality, environmental awareness, and natural resource protection. Despite its positive impacts, respondents also identified several negative effects of tourism, including social issues, resident discomfort, economic inequalities, environmental pollution, and the destruction of flora and fauna. These challenges impede sustainable tourism development in the region. However, residents generally place less emphasis on these negative impacts, likely due to the high levels of instability and insecurity caused by natural disasters. Their strong desire to restore their pre-disaster livelihoods (Nuntaboot et al., 2020)and long-term adaptation to recurring crises may make them less sensitive to the comparatively minor adverse effects of tourism development.

TanguarHaor, prone to floods and natural disasters, often exceeds the community's coping capacity, requiring external aid, especially for vulnerable groups. These calamities impact tourism, resources, and livelihoods, but tourism can support recovery. Disaster-stricken areas attract tourists, underscoring the need to assess tourism's environmental impacts and disasters' effects on local populations. Community resilience involves measures like property relocation, environmental monitoring, and emergency training. With similar economic and cultural contexts, Tahirpur and Dharmapasha Upazilas showed no significant differences in tourism impact perceptions.

The study highlights pre-disaster training, emergency systems, and medical plans as crucial. Tourism's positive environmental impacts, such as improved transport and awareness, boost resilience, while disasters heighten environmental vulnerability. Strong resilience in high-risk tourism areas requires an integrated approach.

Beyond addressing individual dimensions of tourism impact—environmental, sociocultural, and economic—it is essential to incorporate tourism into broader community development efforts (Ap, 1992). The case study aligns with the findings of Pelling (2012), Sugiura et al. (2021) and Sarker & Sujauddin (2020) on disaster preparation and risk reduction. Respondents acknowledge the value of external assistance, including from government agencies, but emphasize the importance of self-help and mutual community support. Similarly, Bornilla et al. (2023) observed in the Philippines that communities transitioned from reliance on assistance to self-management.

The capability for self-help is critical in minimizing damage during the initial moments of a disaster.Full recovery often requires external support and extended timeframes. However, when coordinated with external aid, self-help capabilities act as a stabilizing force, facilitating effective recovery. Cultivating independent relief capabilities is thus a long-term priority for communities (Ahmed et al., 2016). Active participation in disaster risk reduction (DRR) activities significantly reduces disaster losses, as communities become first responders (Bali, 2022). Promoting disaster prevention awareness is a key component of building long-term community resilience, equipping communities with the knowledge

required to respond effectively during disasters. Communities should engage in mutual aid during disasters, focusing on supporting vulnerable groups. Local governments must implement disaster prevention measures and collaborate with communities to enhance resilience. Investments in infrastructure, such as evacuation facilities and prevention projects, are essential, along with capacity-building efforts like training and youth employment initiatives. Emphasizing cultural preservation and environmental sustainability can further strengthen resilience in disaster-prone areas.

CONCLUSION

This study examines perceptions of tourism and disasters in TanguarHaor, a disaster-prone region. Despite its vulnerability, residents show strong community attachment and satisfaction. Self-help, disaster prevention, and adaptive capacity are vital for effective disaster response. Tourism contributes to employment, local demand, and infrastructure, supporting socio-cultural, economic, and environmental stability. Promoting these benefits while minimizing economic inequality, social issues, and environmental degradation can enhance well-being and sustainable tourism.

Strengthening community participation in disaster prevention and promoting eco-friendly tourism improve resilience and environmental awareness. Leveraging tourism's economic benefits for job creation and investment, along with agricultural adaptation and job diversification, reduces disaster impacts and boosts preparedness.

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THE ROLE OF SPIRITUAL VALUES IN TOURISM: INSIGHTS FROM SLOVAK TOURISTS

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Abstract: Tourism is a multifaceted phenomenon encompassing a wide range of cultural, historical, recreational, and spiritual dimensions. One such aspect, the pursuit of spiritual values, plays a significant role in shaping travel motivations. Spiritual tourism extends beyond traditional religious tourism to include opportunities for personal reflection, meditation, and visits to sacred sites. Spiritual tourism incorporates a diverse range of tourism activities such as pilgrimages, festivals, visits to sacred spaces and explorations of religious and cultural heritage. This study examines whether Slovak tourists actively seek spiritual values during their holidays and identifies the demographic groups which are most interested in different types of religious tourist sites. A questionnaire survey was conducted among 752 Slovak respondents to assess their preferences for spiritual experiences while traveling. The collected data was analyzed using descriptive statistics and non-parametric statistical methods, including Spearman's rank correlation, the Mann-Whitney test, and the Kruskal-Wallis test. The results offer valuable insights into the motivations of Slovak tourists. Although Slovakia remains a strongly religious country, only about 22% of respondents viewed the pursuit of spiritual elements as an important factor when selecting their holiday destinations, with respondents who rated spiritual values as important in their everyday lives seeking out such experiences more frequently during their vacations. However, religious sites and events attracted both religious and non-religious tourists, although generational differences were identified in terms of the forms which this participation took. Older travelers preferred traditional religious activities, whereas younger travelers were more inclined toward concerts and cultural events with spiritual themes. The study highlights the growing appeal of intangible cultural heritage and the integration of spiritual elements into tourism services. The results offer practical implications for destination marketing and tourism development, suggesting that travel agencies and policymakers should consider the diverse motivations of tourists when formulating tourism products.

Keywords: religious tourism, spiritual tourism, pilgrimage sites, travelers, destination marketing, spiritual values

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INTRODUCTION

Tourism is characterized by a deliberate departure from everyday life, providing individuals with the opportunity to encounter new stimuli and situations. This experience has the potential to transform the unfamiliar into lasting and memorable moments (Agapito & Sigala, 2024; Carvalho & Alves, 2023; Bernaki & Mars, 2023) have suggested that the tourist experience is a complex interplay of cognitive, emotional, sensory and behavioural interactions, and the careful management of these interactions throughout a tourist's journey can enhance their satisfaction and foster the creation of lasting memories. The management of experiences in tourism destinations has been a topic of research for over two decades but, as has been noted by the UNWTO (2023), recent years have seen a growing interest in spiritual heritage, often at the expense of more tangible forms of heritage.

Spiritual values are a key component of cultural heritage, and their integration into tourism strategies can help to enhance the overall visitor experience. This shift has been attributed to the expansion of tourism consumption into areas such as contemporary culture, creativity and cultural experiences derived from local lifestyles, traditions and gastronomy (OECD, 2008; Cordova-Buiza et al., 2024; Chaigasem & Kumboon, 2024).

Despite global trends toward secularization (Jirásek & Štěrbová, 2023; Bachimon & Thery, 2021; Marine-Roig, 2015) and the rise of consumerism (Dimitrovski et al., 2020), there has been a notable increase in demand for tourism activities that incorporate spiritual values, particularly in the realm of religious tourism (Qiu et al., 2022; Iliev, 2020; Collins-Kreiner, 2020; Darabos et al., 2024). As is apparent in Durán-Sánchez et al. (2018) in their bibliometric analysis and more recently in a review by Qiu et al. (2022), religious tourism is now the focus of considerable research within the

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broader context of intangible cultural heritage, in addition to ecotourism, gastrotourism and festival tourism. Several studies have also explored the motivations of pilgrims, revealing that the motivations of such travellers are not only religious but also secular (Jirásek & Štěrbová, 2023; Marine-Roig, 2015). The exploration of spiritual elements in tourism is significant not only within the context of religious tourism but also in terms of the broader products and services which individual destinations can offer. Spirituality is a natural human desire which has long served as a motivation for travel and the search for meaningful experiences (Soares et al., 2024). Furthermore, spirituality in travel is frequently linked to benefits in mental health and well-being, reinforcing its continued importance in contemporary tourism (Heintzman, 2010; Warfield et al., 2014; Kainthola et al., 2023; Klimiuk & Moriarty, 2021).

Although travel with purely spiritual motivations is a less common phenomenon, tourists are often driven by a combination of secular and spiritual interests (Brumec et al., 2023). Major spiritual destinations such as Compostela, Lourdes and Via Francigena attract visitors from around the world, but many spiritual sites of local or national significance are becoming increasingly important, particularly in the changing tourism landscape of the post-COVID era (Olsen & Timothy, 2020; Mróz, 2021). While these smaller pilgrimage sites might not enjoy the global appeal of major pilgrimage destinations, they nonetheless play a crucial role in destination management and the development of sustainable tourism practices (Guriță & Scortescu, 2023; Notarstefano & Gristina, 2021).

The demand for intangible cultural heritage in tourism is also on the rise within the specific context of Slovakia. This Central European country is a still highly religious, and it would therefore be useful to explore the importance of spiritual experiences for Slovak travellers during their holidays. The objective of this paper is thus to investigate whether Slovak tourists seek out spiritual values during their holidays and to identify which demographic groups are most interested in various types of religious tourism sites.

Theoretical Framework

The 1990s saw a significant shift in research into tourism trends with the emergence of discussions into the changing nature of religious travel and the increasing relevance of tourism for religious purposes. Seminal works such as "Forms of Religious Tourism" by Rinschede (1992) and "Religious Sites as Tourism Attractions in Europe" by Nolan and Nolan (1992) laid out the foundational theoretical framework for understanding religious tourism. Rinschede (1992) defines religious tourism as any journey undertaken for religious reasons, either in part or fully, a category which encompasses visits to sacred places, pilgrimage sites or religious ceremonies, festivals and performances.

One particular area of scholarly interest is the motivation and behaviour of religious travellers. Some authors distinguish between pilgrims and tourists, both of whom engage in religious tourism, a distinction which has evolved as secular pilgrimage has developed alongside traditional religious pilgrimages. Hyde & Harman (2011) explored the motivations of non-religious individuals who visit pilgrimage sites in search of personal meaning, while Smith (1992) proposed the "sacred-profane continuum" of acts of pilgrimage, with religiously motivated pilgrimage situated at one end of the spectrum and secular travel at the other. Secular travellers often aim to fulfil more personal needs such as pursuing sports and adventurous activities, wellness or self-reflection. In contrast, religious motivations are typically linked to practices of religious rituals, affirmations of personal and family identity, the fostering of cohesion with a religious community, or the deepening of an individual's cultural and spiritual context. Several studies have confirmed that the pursuit of peace and happiness through visits to sacred sites is a key motivation driving religious tourism (Olsen, 2014).

However, purely religious or purely secular motivations for travel are generally rare; a combination of both needs is more common, with travellers often motivated by a blend of spiritual and non-spiritual elements (Brumec et al., 2023). It is also important to incorporate the perspectives of local communities, as the experiences which individuals enjoy at sacred sites can vary depending on whether visits are undertaken alone or as part of a group (Shinde, 2021).

Empirical data also indicates differing motivations in the cases of both religious and secular travellers travelling along pilgrimage routes. For example, data from the Associazione Europea delle Vie Francigene (2024), an organization which monitors the Via Francigena pilgrimage route to Rome, reveals a continuous rise in numbers of pilgrims on the route. In 2023, for example, 35% of pilgrims cited religious and personal development factors as motivations for their journeys, while other key motivations recorded in the survey included the desire to share experiences with others (50%), cultural interests (38%) and more general tourist activities (35%). Additional motivations included interest in the environment, sports and gastronomic or wine tourism. The pilgrimage route to Assisi in Italy also experienced a record increase in walking pilgrims in 2022, with Sviluppumbria (2024) reporting a 26% rise over figures from 2021, surpassing even pre-pandemic statistics. While a third of pilgrims cited religious motivations for their decision to journey on the route, other reasons included the search for inner peace and cultural experiences. This route also recorded an increase in participation among younger age groups, reflecting this broader trend in pilgrimage tourism.

Sites Typology in Spiritual Tourism

Academic literature on spiritual tourism has identified a diverse range of activities associated with the topic, with several works developing various typologies with which to define the phenomenon (Ohlan & Ohlan, 2024; Collins-Kreiner & Wall, 2015; Kujawa, 2017; Norman, 2012). These typologies are categorized based on the main activities pursued by tourists:

- Religious rituals,
- Pilgrimages,
- Heritage exploration,

- Spiritual tourism,
- Experiential spiritual tourism.

These categories demonstrate the variety of ways in which spiritual and religious elements are integrated into the tourism experience, with tourists often seeking a blend of both spiritual growth and cultural enrichment.

Recent research by Shinde (2021) has provided a comprehensive overview of trends in religious tourism, focusing on how the field has evolved in response to social shifts and the growing secularism of contemporary society. In addition to traditional sacred sites, new sacralized spaces linked to contemporary spiritual practices have emerged, attracting both religious and non-religious visitors and offering considerable economic and social benefits for local areas. Less formally religious facilities have been developed in these sites to meet the needs of tourists, some of which have been provided by religious organizations and others by local communities.

Religious tourism is often associated with "slow tourism," but new modes of transportation have altered this dynamic, creating new challenges for managing the influx of visitors (Shinde, 2021). Alongside the spiritual dimension, many studies have examined the economic, sociocultural and environmental impacts of religious tourism on both sacred sites and local populations. Shinde (2021) and other scholars have also addressed the negative impacts of the trend, noting the commercialization of sacred sites, increased pollution, the loss of heritage buildings and the strain placed on local resources due to increased tourism. Bennett-Cook (2022) perceives institutional management as one of the most under-researched areas in tourism literature and calls for more in-depth and comprehensive research into the issue.

Religious Tourism in Slovakia

The predominant influence of Christianity on the Slovak population is deeply rooted in the country's historical development and has led to the establishment of numerous pilgrimage sites that continue to play a significant role in Slovak culture. During the 1950s, almost 99.5% of the population identified as Christian, and a strong Christian confession persisted even after several decade active secularism under socialism. The most recent population census in 2021 reveals the continuing influence of Christianity, with 58.9% of the population identifying as members of the Catholic Church, and 55.8% specifically affiliating with the Roman Catholic denomination. Nonetheless, the results also indicated a rising trend of secularization in Slovak society, with almost 24% of the population identifying as non-religious (Figure 1).

The country possesses a well-developed sacral infrastructure, with an average of 1.43 churches per municipality; of Slovakia's 2,927 municipalities, 2,685 have at least one church (Dzurjanin, 2008). Krogmann et al. (2017) explored religiosity and its impact on tourism in Slovakia, identifying 147 Catholic pilgrimage sites across 137 individual settlements. These sites are widely dispersed, with the highest concentration in Western Slovakia (35%), followed by 33% in Central Slovakia and 31% in Eastern Slovakia. Pilgrimage sites in Slovakia have varying degrees of significance in religious tourism, with the most visited being the Marian pilgrimage sites and those associated with Saints Cyril and Methodius. The majority (90%) of these sites hold local or regional importance, while seven sites are of national significance (Krogmann et al., 2017, Hronček et al., 2022).

Understanding the character of individual pilgrimage sites is crucial for ensuring the optimal development of religious tourism. Under suitable conditions, the sites of national importance in particular can emerge as prominent centres of religious tourism, attracting both devout and secular tourists. Nonetheless, the majority of pilgrimage sites in Slovakia have failed to fulfil their potential, albeit with a few notable exceptions.

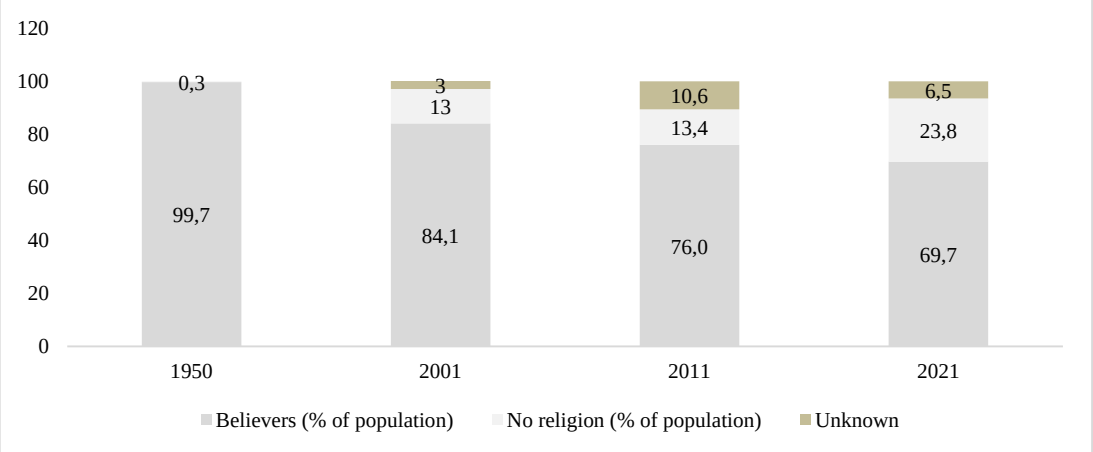


Figure 1. Population distribution by religious affiliation in Slovakia 1950 – 2021
(Source: Census of Population, Houses & Dwellings, 2021, Statistical Office of the Slovak Republic, 2023)

DATA AND METHODS

Our study aims to outline the preferences of respondents regarding the pursuit of spiritual values within the context of their tourist activities and to identify factors associated with their choices. The data for the analysis was obtained through a survey conducted among Slovak travellers between March 2024 and May 2024. The data collection process employed a mixed-method approach, integrating online responses through the Google survey platform and the Computer-Assisted Web

Interviewing (CAWI) method. The questionnaires were available exclusively in digital format, but interviewers were present to provide assistance and facilitate accurate inputs from respondents, particularly older participants, in order to minimize potential misunderstandings and enhance the reliability of the collected data. The data was collected by 97 trained interviewers, and the participants were primarily from the western regions of Slovakia with a strong tradition of pilgrimage (Trnava, Bratislava, Nitra, Trenčín and Žilina). The questionnaire included multiple-choice and scaled questions on a Likert 5-point scale which were formulated to identify interest in specific spiritual elements during holidays.

The survey collected a total of 752 valid responses which were then subjected to statistical analysis. For the purposes of our research, we developed a categorisation of spiritual places that reflected national and regional specificities as well as religious practices in Slovakia. The questionnaire items were organized into the following categories:

- participation in religious services,
- visits to places of worship or pilgrimage sites,
- visits to smaller sacred sites (e.g., Calvaries, exhibitions with spiritual themes, sites related to the lives of saints),
- attendance at cultural events with spiritual elements (e.g., concerts, exhibitions, festivals).

In formulating the survey questions, we considered both the tangible and intangible aspects of cultural heritage. Participation in religious services and attendance at spiritual cultural events emphasized intangible heritage (i.e., events or practices), while interest in visiting churches, pilgrimage sites and smaller sacred buildings highlighted tangible cultural heritage (i.e., physical sites and objects).

Sample

A detailed description of the respondents who formed the research sample is presented in Table 1. The target group for the survey were tourists over the age of 15, and all age categories were represented in the final results. Notably, there was a higher representation of women among the participants; women comprised 59% of the sample, while men accounted for 41%. In terms of religious affiliation, 70% of respondents identified as Catholics and 13% described themselves as belonging to other religious groups. Questions on the educational background of the participants showed that 66% had completed secondary education and 29% had tertiary education.

Table 1. Baselines of the respondents **(**Source: authors' own**)**

Variable	**Categories**	**N**	
Respondents		752	
Gender	Men	307	*41%*
	Women	445	*59%*
Age	Up to 25 years	257	*34%*
	26-35 years	78	*10%*
	36-45 years	94	*13%*
	46-55 years	127	*17%*
	56-65 years	45	*6%*
	66 and more	151	*20%*
Religion	Catholics	525	*70%*
	Other religion	94	*13%*
	No religion	133	*18%*
Education	Primary	34	*5%*
	Secondary	499	*66%*
	Tertiary	219	*29%*

Methods

The data obtained through the questionnaire was subsequently processed using a series of standard statistical methods, namely Spearman's rank correlation, the Man-Whitney U test for verification hypothesis concerning the differences between men and women, and the Kruskal-Wallis test for verification hypothesis concerning differences between age groups, educational categories and religious affiliations. The aim of our analysis is to gain a deeper understanding of the importance of spiritual elements in the decision-making processes of Slovak tourists.

In our research we posed several key research questions (RQ):

- **RQ 1:** How important is the search for spiritual elements to Slovak tourists during their holidays?
- **RQ2:** What spiritual experiences do Slovak tourists most often look for during their holidays?
- **RQ 3:** What is the relationship between various socio-demographic characteristics (gender, age, education, religion) and the search for spiritual elements during vacations?
- **RQ4:** What is the relationship between the search for spiritual values in daily life and during vacations?

RESULTS

The analysis of the survey data revealed distinct preferences among Slovak travellers for engaging in spiritually enriching activities during their travels. Several factors were identified as significant in influencing these preferences.

The pursuit of spiritual elements during holidays was not considered a priority for most respondents. When choosing a holiday destination, 22% of respondents take into account the availability of spiritual offerings, but a majority of 51.5% indicated that this was not an essential part of the decision-making process (Figure 2).

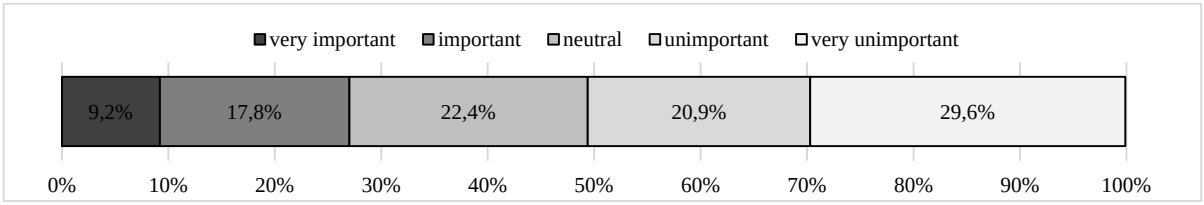


Figure 2. Importance of spiritual elements during holidays (Source: authors' own)

Nonetheless, there was a significant difference in attitudes toward spiritual elements during holidays between individual age groups and religious affiliations. Among younger and middle-aged respondents, approximately 56% of younger and middle-aged respondents did not consider the search for spiritual elements on vacation as significant, with only 21% viewing this feature as important. In contrast, however, older respondents (55+) exhibited a greater inclination towards spiritual engagement during holidays, with 45% seeking spiritual elements and 34% not considering it important (Figure 3). Similarly, 30% of religious respondents considered spiritual elements as important during their vacations, while 47% did not. In comparison, only 12% of non-religious respondents attached importance to spiritual elements, with 76% considering them unimportant (Figure 4).

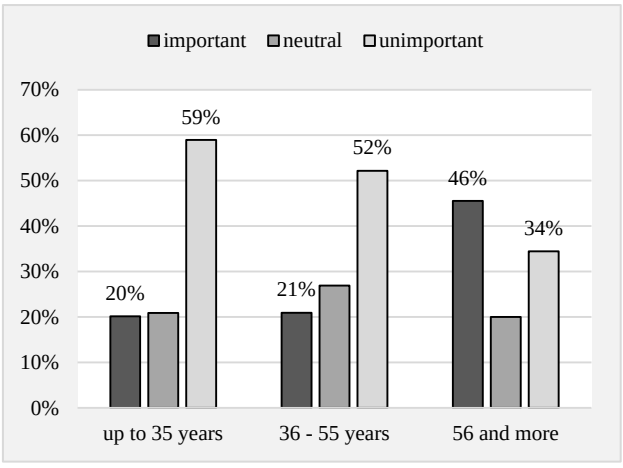


Figure 3. Importance of spiritual elements during holidays according to age of respondents (Source: authors' own)

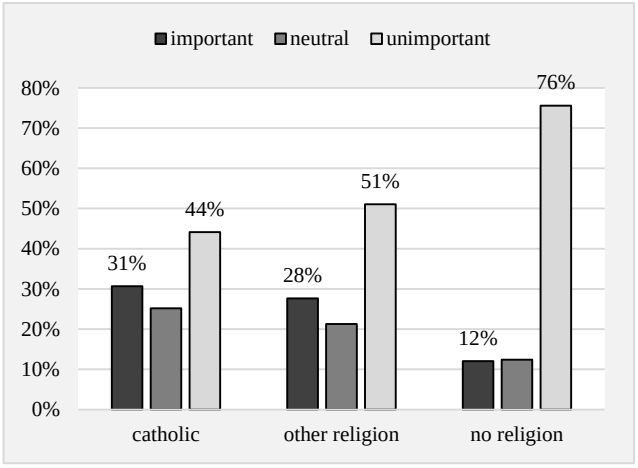


Figure 4. Importance of spiritual elements during holidays according to religious affiliation (Source: authors' own)

No statistically significant difference was observed between men and women in how important they consider the choice of holiday destination depending on the availability of spiritual elements (Mann-Whitney test, p-value = 0.0904) (Table 2).

Table 2. Importance of the availability of spiritual elements when choosing a holiday destination (Source: authors' own)

	Very important 1	2	Neutral 3	4	Very unimportant 5
Men	7%	12%	19%	18%	45%
Women	10%	13%	17%	20%	39%
All	**9%**	**13%**	**18%**	**19%**	**42%**

We then examined which specific spiritual elements were considered important by respondents, and Table 3 presents the relative frequencies illustrating respondents' preferences for seeking various spiritual elements during holidays. Visiting places of worship or pilgrimage sites emerged as the most valued spiritual activity, with 33.4% of respondents expressing a preference for this type of pursuit. Attending a religious service was considered the least important, with 64.6% of respondents indicating it holds little significance during their holidays.

Table 3. Importance of individual spiritual elements during holidays - relative frequency of Likert 5-point scale **(**Source: authors' own**)**

During holiday visiting:	Very important 1	2	Neutral 3	4	Very unimportant 5
• Church services	9.8%	9.8%	15.7%	17.7%	46.9%
• Places of worship or pilgrimage	12.0%	21.4%	25.1%	20.3%	21.1%
• Exhibitions with spiritual themes	8.6%	21.8%	25.8%	23.7%	20.1%
• Spiritual concerts, events	6.3%	18.2%	23.1%	22.1%	30.3%

Attitudes toward seeking spiritual elements during holidays differ significantly between various groups of respondents. Table 4 presents the relative frequencies of respondents who identified selected spiritual elements as either very important or important during their holiday. Considerable differences were also observed across age groups, with respondents aged 55 and older placing significantly more importance on spiritual activities compared to those under 55. Among the 55+ age group, 40% of respondents considered attending a religious service as important, 56% valued

visiting a place of worship or pilgrimage site, 53% prioritized visiting an exhibition with a sacred theme, and 34% attached importance to attending a spiritual-themed event during the course of their holiday.

Little variation was apparent between younger (under 35 years) and middle-aged (under 55 years) respondents in terms of the importance they place on spiritual elements. Approximately 25% of both groups ranked visiting places of worship or pilgrimage sites as the most important activity, while attending a religious service was considered the least important activity (13%). In terms of education, respondents with primary education were the most likely to value spiritual elements during their holidays. Regarding religious affiliation, approximately 30% to 38% of respondents who identify with a religion considered it important to seek out spiritual experiences, in contrast to the approximately 15% of respondents without religious affiliations. Gender differences also emerged in the data, with more women than men considering spiritual activities an important element of their holiday plans. Specifically, 37% of women viewed visiting a place of worship or pilgrimage as important compared to 28% of men. Similarly, 34% of women valued visiting an exhibition with a sacred theme compared to 25% of men, while 27% of women prioritized attending a spiritual event compared to 21% of men. Attending a religious service was considered important by an equal proportion of women and men, with about one-fifth of respondents of each gender expressing this view.

Table 4. Relative frequency of respondents by category who ranked visiting selected spiritual elements during their holiday as important (Source: authors' own)

		Frequency (N = 752)	Church services	Places of worship or pilgrimage	Exhibitions with spiritual themes	Events with spiritual content
Age	up to 35 years	335 (45%)	12%	24%	22%	23%
	36 - 55 years	221 (29%)	14%	28%	24%	19%
	56 and more	196 (26%)	40%	56%	53%	34%
Education	primary	34 (5%)	26%	59%	56%	38%
	secondary	499 (66%)	19%	32%	30%	22%
	tertiary	219 (29%)	21%	33%	28%	27%
Religion	Catholic	525 (70%)	38%	38%	35%	25%
	other religion	94 (13%)	34%	34%	29%	32%
	no religion	133 (18%)	14%	14%	12%	17%
Gender	men	307 (41%)	19%	28%	25%	21%
	women	445 (59%)	20%	37%	34%	27%

Note: The percentages in the table represent the proportion of respondents who ranked the spiritual element as very important or important during the holiday.

As was discussed above, the most valued spiritual element of respondents' holiday plans was visits to places of worship or pilgrimage sites. Given this finding, we decided to examine how the significance attached to this activity varied across different demographic groups, including age, religion, education and gender.

As is shown in Figure 5, 56% of older respondents (aged 55 and above) considered visiting places of worship or pilgrimage sites, compared to only 26% of respondents under 55.

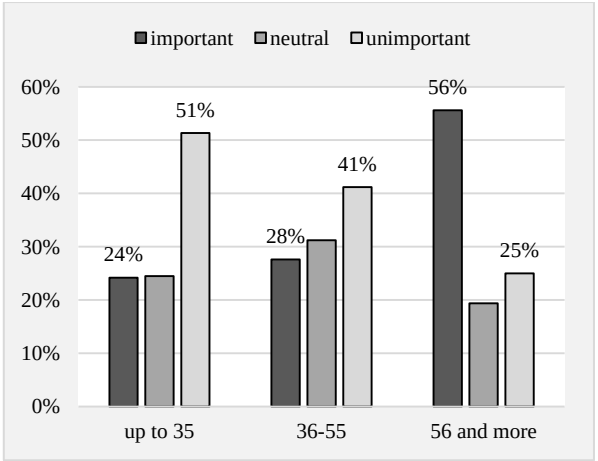


Figure 5. Importance of visiting places of worship during holidays according to age of respondents

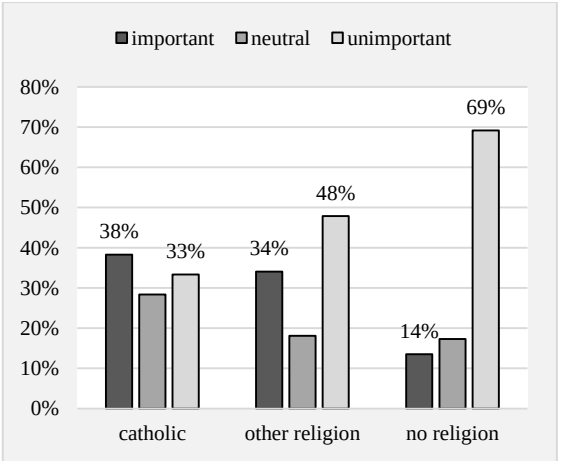


Figure 6. Importance of visiting places of worship during holidays according to religion of respondents

In terms of religious affiliation, 38% of Catholics and 34% of respondents from other religious groups valued visiting places of worship or pilgrimage sites during their holidays, while only 14% of non-religious respondents shared this sentiment (Figure 6). Educational background also played a role in this respect, with 59% of respondents with a primary education comprised largely of secondary school students and retirees in our sample—placing the highest importance on this activity (Figure 7). Lastly, gender differences were clearly evident, with 37% of women and 28% of men considering visits to places of worship or pilgrimage sites an important part of their holiday experience (Figure 8).

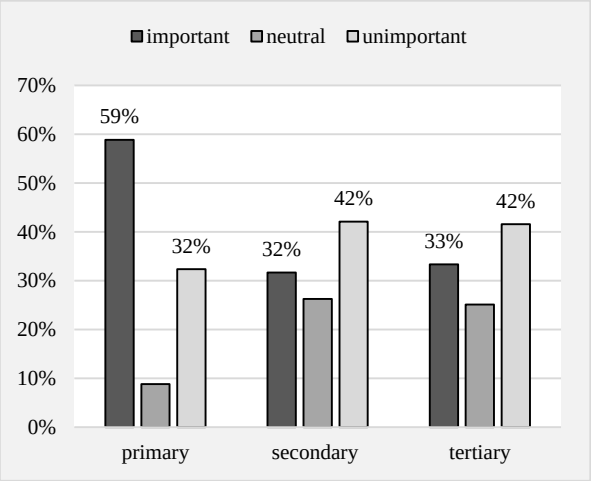


Figure 7. Importance of visiting places of worship during holidays according to education (Source: authors' own)

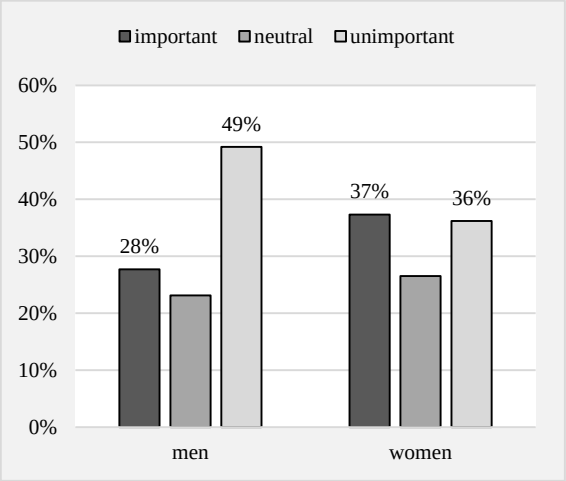


Figure 8. Importance of visiting places of worship during holidays according to gender (Source: authors' own)

We then investigated whether there was any connection between individuals' spiritual behaviours in daily life and during their vacations. The analysis revealed a statistically significant positive correlation between the intensity of seeking spiritual values in everyday life and during holidays; the Spearman's rank-order correlation coefficient was calculated as r_s= 0,793 (p-value <0,0001), indicating a strong relationship.

This correlation is illustrated in Figure 9, where a greater emphasis on spiritual values in everyday life corresponds with a greater importance placed on spiritual values during respondents' holidays.

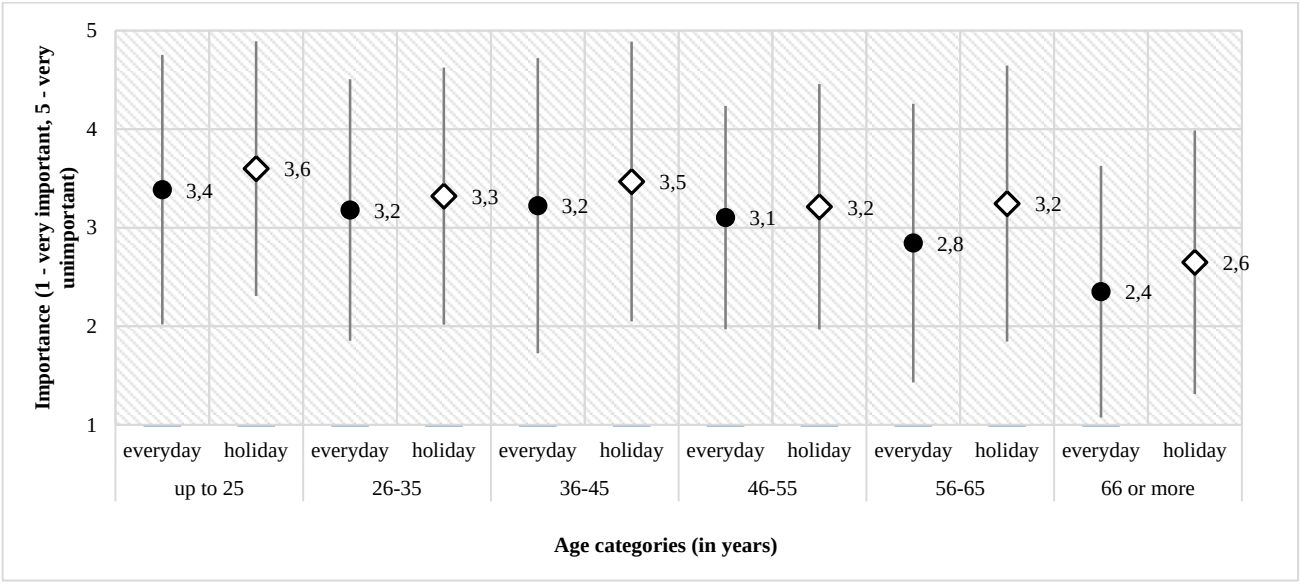


Figure 9. Importance of spiritual values in everyday life and during holidays according to age categories. Mean plot shows the average value +/- SD (standard deviation) (Source: authors' own)

Additionally, the search for spiritual values was found to vary by age. Figure 9 presents a mean plot showing the average importance of seeking spiritual values in both everyday life and during holidays. For younger and middle-aged individuals, these values tend to be relatively unimportant, with mean values slightly above a neutral score of 3 on the Likert scale, suggesting a tendency toward viewing spiritual values as insignificant.

In contrast, mean values below 3, scores which indicate a greater importance being placed on spiritual values, were observed primarily among older respondents. This demonstrates that older individuals are more inclined to prioritize spiritual values in both their daily lives and during their holidays.

The analysis revealed a statistically significant correlation between an emphasis on spiritual values in everyday life and the inclination to seek spiritual experiences during holidays (Table 5.). More specifically, individuals who prioritize spiritual values in their daily lives are more likely to select holiday destinations that incorporate spiritual elements (r_s = 0.615), participate in religious services while on holiday (r_s = 0.612), visit places of worship or pilgrimage sites (r_s = 0.549), explore exhibitions with spiritual themes (r_s = 0.506), or attend cultural events with spiritual content (r_s = 0.459). These findings suggest that higher levels of spiritual engagement in everyday life are associated with a greater propensity to incorporate spirituality into holiday activities.

Table 5. Correlation between the importance of spiritual values in everyday life and the search for spiritual elements during holidays (Spearman's Rank Correlation coefficients) (Source: authors' own)

	Importance of spiritual values in everyday life
Choosing a holiday destination according to the availability of spiritual elements	0.615
Attending church services during holidays	0.612
Visiting places of worship or pilgrimage sites during holidays	0.549
Visiting an exhibition with a sacred theme during holidays	0.506
Visiting a cultural event with spiritual content	0.459

When comparing respondents based on age, education, religion and gender in terms of their experience with spiritual values in daily life and their search for spiritual elements during holidays, statistically significant differences were observed across the categories. The results from the Kruskal-Wallis test and the Mann-Whitney test (used for gender comparisons), provide p-values that highlight these differences, as is shown in Table 6. However, when respondents were categorized by education level, no statistically significant differences were found (p-values > 0.05), thereby indicating that education does not significantly influence these particular aspects of spiritual engagement during holidays.

Table 6. Results of Kruskal-Wallis tests or Mann-Whitney tests (p-values) - testing differences between categories of respondents by age, education, religion and gender (Source: authors' own)

Spiritual values in life / Spiritual elements during holiday	Age	Education	Religion	Gender
Importance of spiritual values in everyday life	< 0.001	0.014	< 0.001	0.0002
Importance of spiritual values during holidays	< 0.001	0.004	< 0.001	0.0003
Choosing a holiday destination according to the availability of spiritual elements	< 0.001	0.070*	< 0.001	0.0904*
Attending church services during holidays	< 0.001	0.054*	< 0.001	0.3889*
Visiting a place of worship or pilgrimage site during holidays	< 0.001	0.061*	< 0.001	0.0001
Visiting an exhibition with a sacred theme during holidays	< 0.001	0.004	< 0.001	0.0007
Visiting a cultural event with spiritual content during holidays	0.004	0.001	< 0.001	0.0220

*NOT statistically significant at 0.05 level of significance

CONCLUSION

This study contributes to a broader understanding of tourist behaviour by identifying the preferences and influencing factors related to the search for spiritual values among Slovak travellers. The research maps their preferences in choosing destinations which are either related to the practice of spiritual life or which feature spiritual elements as part of their cultural or historical identity.

The analysis yielded several key findings related to the four research questions:

How important is the search for spiritual elements to Slovak tourists during their holidays?

Although Slovakia remains a religious country, only around 22% of respondents considered the search for spiritual elements as a significant factor in choosing a holiday destination, suggesting that spiritual tourism is a niche but notable interest, especially among older tourists. This finding aligns with global trends, where older tourists are becoming more active travellers due to improved health and extended life expectancy.

What spiritual experiences do Slovak tourists most often look for during their holidays?

The findings showed that the presence of spiritual elements was not even a decisive factor in the selection of a holiday destination among groups of tourists who seek them out in their holiday location.

The most sought-after spiritual elements on vacations are visits to places of worship and pilgrimage sites, followed by sacred-themed exhibitions and event with spiritual content. Other elements were a lower priority for most respondents, especially among younger generations.

What is the relationship between various socio-demographic characteristics (gender, age, education, religion) and the search for spiritual elements during vacations?

Socio-demographic factors were found to strongly influence the search for spiritual elements, and the data highlights clear differences in preferences based on age, gender, education and religious affiliation. Older tourists (55+), women, those with a primary education and religious individuals were more likely to seek out spiritual experiences during their holidays. In contrast, younger tourists and non-religious individuals place significantly less importance on such activities.

What is the relationship between seeking spiritual values in daily life and during vacations?

Respondents who placed high value on spiritual elements in their everyday lives were found to be more likely to seek out similar experiences during their vacations, thereby suggesting a consistent approach to spirituality across both everyday life and travel contexts, particularly among older and more religious respondents.

The findings of this study highlight a number of important implications for tourism strategies, particularly regarding the integration of spiritual elements into the product portfolio of tourism destinations. Notably, 22% of tourists consider the availability of spiritual experiences as a key factor in their destination choice, and this thus represents a significant opportunity for tourism product development in Slovakia. However, this potential is not only restricted to religious tourists but also encompasses non-religious individuals across a range of age categories.

The findings support earlier research into the search for spiritual values as part of leisure time activities. The positive correlation between an individual's level of spirituality and their likelihood of seeking out spiritual experiences during holidays underscores the growing role of spirituality in shaping travel behaviours and preferences, suggesting potential

opportunities for tourism strategies which can incorporate spiritual elements that appeal to a broad audience. The results suggest that tourist destinations should develop strategies that cater to the spiritual aspirations of travellers, particularly those of older age groups which may benefit from enhanced services such as improved health facilities and accessibility. However, spiritual tourism can also appeal to younger generations and non-religious travellers, with the results of our study showing that events featuring spiritual content, such as festivals and concerts, are particularly attractive to these groups.

The growing potential for spiritual tourism, especially in destinations such as Slovakia with its rich religious heritage, presents a promising avenue for tourism development. Additionally, the increasing interest in intangible heritage and non-commercialized tourism products supports the shift toward more sustainable practices and the emergence of slow tourism. Effective destination management that respects both local cultures and visitor expectations will be crucial in achieving this balance. Marketing efforts should focus on the authentic presentation and interpretation of cultural specificities, promoting a deeper and more meaningful engagement with the destination's spiritual and cultural heritage.

This study has several limitations which might affect the generalizability of the findings, including the constrained sample size and the limited number of survey questions. Although the sample was not representative, it nonetheless provided valuable insights into the significance of spiritual values at tourism destinations within the Slovak context. Future research should aim to build on these findings by incorporating a broader and more representative sample.

Further research is also needed to explore visitors' experiences in more detail, in particular to distinguish between moments when they are acting as tourists and when they are engaging in religious practices. Exploratory research could also focus on the economic and social impacts of religious sites, as well as the institutional management of religious tourism.

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THE EFFECT OF CHANGING THE SHORELINE ON THE EAST RECREATION AREA OF ALAKOL LAKE (KAZAKHSTAN)

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Abstract: The study aims to evaluate the dynamic coastal trends of Lake Alakol, Kazakhstan, using remote sensing and GIS technologies, focusing on shoreline erosion rates and their impact on the eastern recreational zone, a critical area for tourism development near the Kazakhstan-China border. Historical Landsat satellite imagery (1999–2023) was analyzed using the Digital Shoreline Analysis System (DSAS) in ArcGIS to calculate key shoreline change indicators, including Net Shoreline Movement (NSM), Shoreline Change Envelope (SCE), End Point Rate (EPR), and Linear Regression Rate (LRR). This approach enabled the quantification of long-term shoreline dynamics, identifying high-risk zones prone to erosion. The analysis revealed a significant average landward shoreline retreat of 89.1 meters over the study period. The eastern shore, particularly Zone A near the village of Kabanbay, exhibited the highest erosion rates (-14.18 m/year), posing a "very high" risk to recreational infrastructure and tourism activities. Other zones also showed moderate to high erosion risks, emphasizing the vulnerability of the eastern shoreline to environmental factors, such as wave activity and wind dynamics. These findings underscore the urgent need for proactive shoreline protection and sustainable coastal management practices to safeguard the region's ecological and economic assets. The research highlights the critical importance of protecting Lake Alakol's shoreline to ensure the long-term viability of tourism and recreational activities, which are central to regional development. Proactive measures, including the integration of advanced remote sensing technologies and eco-friendly shoreline reinforcement strategies, are essential for mitigating erosion risks. The findings also open opportunities for collaboration with neighboring regions, including China, in addressing shared environmental challenges. Continuous monitoring, stakeholder engagement, and alignment with sustainable tourism goals are imperative for balancing environmental conservation with socio-economic progress in the Alakol region.

Keywords: shoreline dynamics, Alakol Lake, remote sensing, GIS, coastal erosion, DSAS, sustainable tourism, recreational areas, environmental management

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INTRODUCTION

The shoreline is the line of contact between land and water. Monitoring shoreline conditions and the rate of shoreline change should be realized as an important indicator of effective basin management with the help of rapid and economic

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remote sensing techniques. Shoreline change is a dynamic natural phenomenon controlled by coastal sediments, beach formation, climate change and human impact. Changes in the shoreline are mainly due to natural conditions (Bird, 1985; Li & Gong, 2016). Rapid shoreline change causes socio-economic and ecological problems in the aquatic ecosystem and leads to degrading coastal conditions. Determining how the shoreline is changing represents an important component in the spatial and temporal analysis of water resources. The main methods of cartographic research and map use employed in this study were: visual analysis of the phenomena depicted on the maps; graphical methods of map analysis (Astakhova, 2016). Traditionally, the shorelines of water bodies are determined once in the interim period when updating cartographic products. In addition to one-time marking of the shoreline, satellite images make it possible to systematically determine the state of the shoreline.

Using satellite images from a multispectral camera, a set of images was compiled in which shorelines are clearly visible, and data on shorelines were obtained using remote sensing (Abrosimov & Dvorkin, 2009). In their 2009 study, Abrosimov and Dvorkin employed statistical analysis of numerical data obtained from remote sensing methods to examine indicators of shoreline change. They also mentioned that using the results of total detected shoreline change from 1999 to 2019, the average distance of the shoreline from the baseline and the annual rate of change for each decade were determined and stratified by risk. According to the latest data (Valeyev et al., 2019; Abitbayeva et al., 2016), the length of various types of erosion ridges on the land shore of Lake Alakol is 40% of the total shoreline length. The shoreline change in the area of the village of Kabanbay, according to research data for the period 1990-2014, was 70-100m. While a continuous increase in the surface of Lake Alakol was observed between 1990-2018, the landward movement of the shoreline was approximately 200-900 m (Abitbayeva et al., 2016). This change is explained by the peculiarity of the geological structure, and the geological structure of the lake has been studied by several scientists (Korovin, 1965; Sala et al., 2020; Bai et al., 2011).

Alakol coast has special natural properties for the development of beach and health tourism and is among the objects included in the TOP-10 tourism project of the Republic of Kazakhstan. In the future, the state will spend 60 million for the development of the infrastructure of the resort region. Plans to invest and develop actively. Currently, the tourist flow is about 190 thousand. By 2030, this figure is expected to increase to 600,000. The main zone for the implementation of this plan is the area near the village of Kabanbay. Therefore, monitoring the dynamics of shoreline changes, risk prevention and planning measures for coastal protection is considered one of the important indicators (Kazakhstan Tourism, 2019).

There are many methods used to measure the long-term change of the shoreline (Haines-Young et al., 2003). One of them is that the use of traditional field research methods requires significant labor and time, and changes in the shoreline can be determined quickly and with high accuracy using Earth remote sensing methods and geographic information systems, which are more effective and cheaper than field methods using satellite images (Cracknell, 1999; Nayak, 2000). In recent years, it has become possible to quickly monitor and detect shoreline changes using historical remote sensing data.

Remote sensing monitoring allows not only to detect changes over time, but also to conduct research on a large area. There are several methods of remote sensing and geoinformation system used to determine the shoreline change: light vision and range detection (LIDAR) method, video technology-based and airborne laser scanner method with synthesized system. These methods provide more accurate data than satellite images, but such data are limited due to the high cost of the database and the data is expensive (Richardson et al., 2014; Genc et al., 2005). Thus, aerial photographs and multispectral satellite imagery are effective tools for cost-effectively monitoring shoreline changes and by comparing images over time. At the same time, studies using such reliable data make it possible to identify and monitor changes in the shoreline at the local level.

In recent years, several studies have been carried out in this area using satellite imagery, including Landsat satellite imagery. For example, Tao et al. (2015), using satellite images of the Earth from the 1980s to the 2000s, identified the rapid loss of lakes in the Mongolian Plateau due to changes in precipitation and agricultural practices. Yiğit et al. (2022) analyzed long-term and short-term shoreline changes in Antalya, Turkey, revealing a strong correlation between shoreline movement indicators but noting limitations in Landsat's spatial resolution. Alwi et al. (2023) found accretion to be dominant in Indonesia's Karimunjawa islands, contrasting with erosion trends elsewhere, yet highlighted the inefficacy of existing coastal defenses. Similarly, Daswin Ebenezer & Kumar (2023) forecasted shoreline changes in Tamil Nadu, India, identifying significant erosion but acknowledging uncertainties in predicting future trends. Pham et al. (2024) examined coastal fluctuations in Vietnam's Sam Son City, attributing changes to both natural forces and tourism-driven development.

Remote sensing techniques have been used to analyze the change in the water surface in this region (Abitbayeva et al., 2016), but the amount of coastal change in certain areas has not been specifically determined. The main objective of the study is to determine the dynamics of changes in the shoreline of the East Coast over the period from 1999 to 2023. Coastal change is especially important in investment regions. For this reason, this study will provide important predictions in the regional distribution of investments to be made in the area, and studies on the amount of shoreline should be carried out for a special area (Bahrami & Siadatmousavi, 2025). The Alakol coast has special natural features for the development of beach and health tourism and is among the objects included in the TOP-10 tourism project of the Republic of Kazakhstan. In the near future, the state plans to actively invest and develop the infrastructure of the resort area, spending 60 million on its development. The number of tourists, which is currently 190 thousand, is expected to increase to 600 thousand in 2030. Analyzing the village of Kabanbay and the surrounding areas, which are expected to attract a large number of tourists with investments, will facilitate taking measures for future natural disasters.

Therefore, the aim of this study is to analyze and quantify the shoreline dynamics of the East Coast of Alakol Lake (Kazakhstan) from 1999 to 2023 using remote sensing and GIS techniques. Given the increasing tourism development in the region, particularly around the village of Kabanbay, monitoring shoreline changes is critical for sustainable shoreline management and infrastructure planning. This study seeks to identify erosion and accretion trends, assess their potential impact on tourism and environmental stability, and provide data-driven insights for future investment and risk mitigation

strategies. By integrating cartographic analysis, statistical methods, and satellite imagery, this research will contribute to effective shoreline management and the sustainable development of Alakol Lake's coastal areas.

MATERIALS AND METHODS

The Alakol Lake lies in the Balkhash-Alakol lowland, spanning the border of Almaty and East Kazakhstan regions, forming the eastern part of the Balkhash-Alakol Basin near the boundary with China. It receives water from over 15 tributaries including the Urzhar, Katynsu, Emelkysa, Ygrajty, Zhamanty, Zhamanotkel, and Tasty rivers, which typically dry up in summer due to the semi-arid climate. Kazakhstan affirmed its dedication to preserving the region's unique biodiversity by ratifying the Convention on Biological Diversity in 1994. As a part of this commitment, the Alakol Lake State Reserve was established in 1998, marking a significant step toward protecting the area's natural richness and fulfilling the goals set in international agreements (Jiyenbekov et al., 2018). Alakol has no current and extends from northwest to southeast. It is located at an absolute altitude of 247.3 m above sea level. The area of the lake, including islands, is 2696 km², with a length of 104 km, a maximum width of 52 km, a shore length of 384 km, an average depth of 22.1 m, and a deepest part of 54 m. The lake's water volume is 58-60 km³. The catchment area is 47,859 km². More than 15 rivers flow into Alakol (Zhetysu Encyclopedia, 2004). The climate of the region is continental and dry (Mannig et al., 2013).

The eastern shore of the Alakol lake basin was considered as the research object (Figure 1). In recent years, the eastern shoreline of the study area, located close to the Chinese border, has undergone natural changes due to the influence of strong waves (Mikhailova & Loginovskaya, 2012; Mikhailova, 2019). The eastern coast of Lake Alakol is considered an important recreational area of the country, mainly for tourism, where recreation and recreation centers are located. It is therefore important to consider the rate of change and shoreline dynamics in this region.

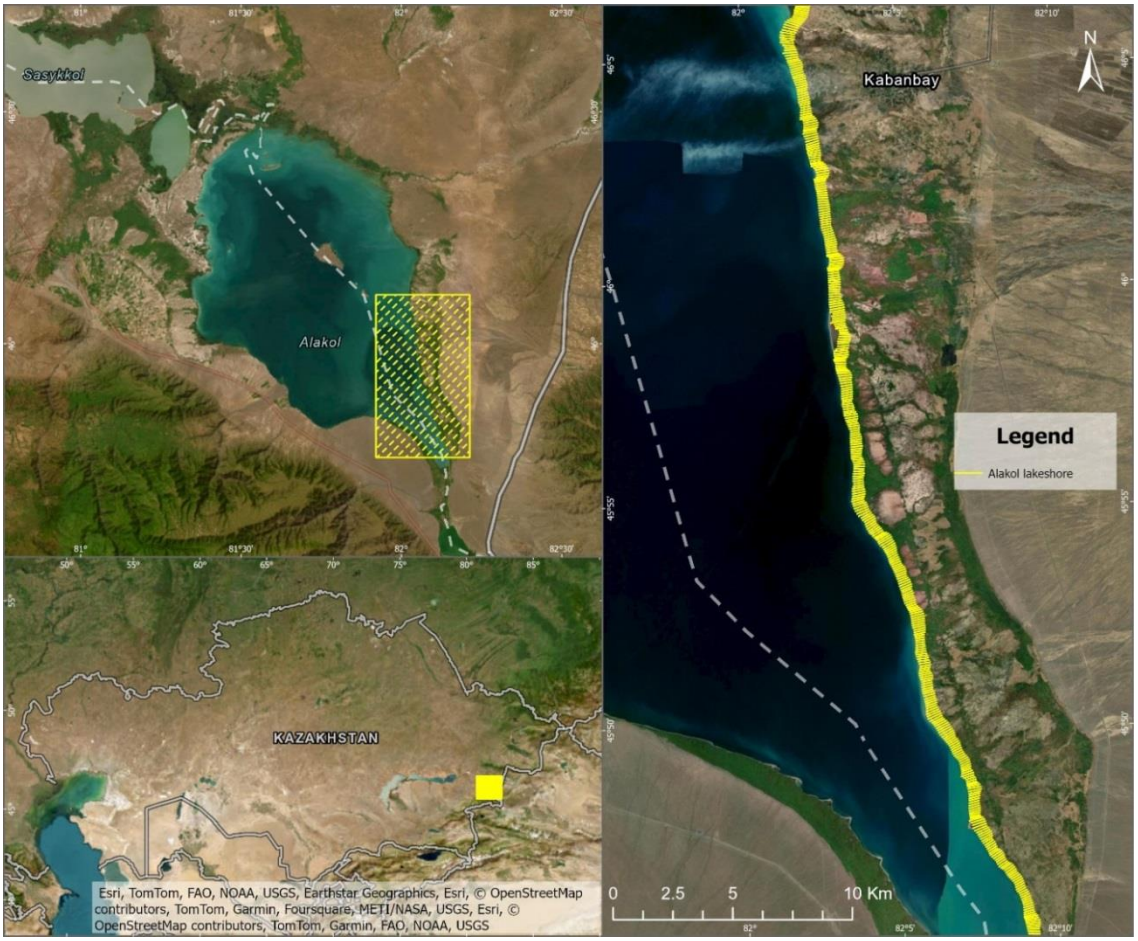


Figure 1. Study area – the Shoreline on the East Area of Alakol Lake (Kazakhstan)

A feature of the rocks that make up the abrasive areas is the predominance of sandstones and mudstones, overlain by sandy-clayey sediments of the Quaternary period. Along the coast in the area of the village of Kabanbay, predominantly modern deposits are widespread: sands, clays, gravel, as well as Upper Quaternary - modern deposits: sands, sands, clays, gravel. Shoreline erosion is the most active modern geomorphological process. First of all, their geological structure is suitable for this. The lithological section of loose coastal sediments begins with strong peats on the surface. Below is a layer of sand and clay. In winter, peat bogs, saturated with moisture, freeze, and they melt almost throughout the summer. As a result of seasonal melting of permafrost, sandy clay rocks are gradually saturated with moisture, which causes the development of surface processes. In general, the climatic and geological factors in the study area are very favorable for the rapid development of abrasion processes. Coastal areas in river valleys can be considered thermos abrasive (Are, 1980).

The coastal zone is a marshy gentle slope with a height of 10-20 m in the south and 60-80 m in the north. In this regard, based on the height of the coast and the composition of the rocks composing it, the eastern coast is conventionally divided into 3 regions: northern, middle and southern. In the first northern area, the average height of the rocks is 60 m and Paleozoic metamorphic schists are developed, forming the base of the Quaternary marine terraces. The second middle platform is quite low, 40 m high. The accumulative coast is marked by a strip of dunes. The third is composed of Quaternary sediments of clayey composition, actively eroded from the south. The processes of landslides and landslides are intense in this area. When peat is mined, rocks with lenses are formed in the lower bedrock. Processes similar to thermal abrasion occur here. The average height of the rock in this area is 15 m. Along with differences in the resistance of rocks to abrasion, the intensity of abrasion processes is influenced by differences in the hydrodynamic activity of coastal waters. A peculiarity of the mechanism of erosion of the shores of the northern part of the lake is that almost all the material coming from the coastal zone as a result of the destruction of the shores is carried away. The rate of shore erosion is different for different parts of the lake and is determined by the running features of hydrodynamic and lithological processes.

Thus, the eastern coast of Lake Alakol, in its geological structure and hydrodynamic conditions, is very suitable for the development of abrasion processes, both currently and geologically, and high abrasion processes can be expected here.

In addition, another feature of Lake Alakol is the strong groundwater supply of underground and artesian waters formed in mountainous regions and alluvial networks of rivers. The total flow to the underground lake (mainly to Lake Alakol) is 0.8 km^3 per year (Bexeitova, 2010). These geological and hydrodynamic conditions, combined with the strong groundwater supply feeding into Lake Alakol, set the stage for significant geomorphic activity. Adding to these dynamics, the wind regime of the Alakol basin is distinguished by its complexity and originality due to the basin's location in the orographic zone. The average annual wind speed in this region is 3-7 m/s, with 10-15% of days experiencing strong winds (over 15 m/s). In some years, this can reach up to 140 days, with recorded maximum wind speeds reaching 60 m/s, as noted at the Zhalanashkol weather station. The observed storm winds, particularly in the Dzungarian Gate area, contribute to seasonal variations in shoreline processes, with the strongest winds occurring in winter and the weakest in summer.

The prevailing wind directions, from west to east at the Alakol weather station and north-southeast at the Zhalanashkol station, further influence the erosion and sediment transport patterns essential to the lake's dynamic landscape (Environmental Impact Assessment, 2019). These complex geological, hydrodynamic, and wind regime factors have contributed to significant shoreline changes in the Alakol basin. As a result, accidents have occurred due to these shifts, leading to the evacuation of some settlements in the region (Bedareva, 2000). The Digital Shoreline Analysis System (DSAS) is a key component of the USGS Shoreline Change Risk Study. DSAS is a tool for processing large volumes of data. DSAS software is designed to simplify the process of calculating shoreline changes and provide the rate of change and statistics needed to determine the accuracy of the calculated results. The latest version currently available is DSAS version 6 and tool offers advanced baseline placement types, attribute automation, data visualization, shoreline change prediction, and the ability to produce a final summary report of identified data (US Geological Survey, 2019). Long-term rates of shoreline change are calculated using linear regression for each perpendicular survey line (transect) from the earliest to the latest shoreline. Linear regression is used in research because it is the most statistically reliable quantitative method (Crowell et al., 1997). It is also the most commonly used statistical method for representing shoreline movement and estimating rates of change (Crowell & Leatherman, 1999; Morton et al., 2004). The methodology followed in this study is summarized in a flowchart (Figure 2), which outlines the sequential steps from satellite image acquisition to shoreline analysis, including image processing, classification, and the determination of shoreline change indicators using the DSAS tool.

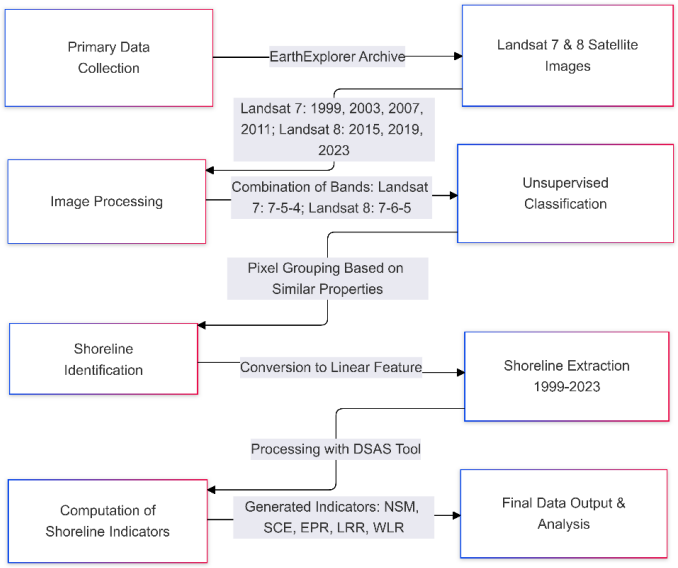


Figure 2. Flowchart of the shoreline analysis methodology, including image processing and DSAS-based indicator calculation

The primary data used was data obtained through the EarthExplorer website (https://earthexplorer.usgs.gov/), which is an open archive. Landsat 7 satellite images from 1999, 2003, 2007, 2011 and Landsat 8 from 2015, 2019, 2023 (spatial accuracy

30 m/pixel) were used as remote sensing data when studying the dynamics of changes in the shoreline. It has been shown that conducting research using Landsat 7 TM satellite images is more effective than using high-precision satellite images when monitoring changes in the shoreline (Kevin & El Asmar, 1999). The Additionally, in Annibale Guariglia's (2006) study on a multi-resource approach to mapping shorelines and detecting coastal change, the land-water boundary determined using Landsat satellite imagery was consistent with GPS-based field studies (Guariglia et al., 2009). The data was used for this study obtained (less than 10% cloud) in a georeferenced form with a UTM projection (zone 44N, WGS-84) shown in Table 1.

Table 1. Data sets and their descriptions used in studying the dynamics of shoreline change

A set of data	Date	Resolution	Data source
Landsat 7	1999/07/09	30	U.S. Geological Survey
Landsat 7	2003/07/20	30	U.S. Geological Survey
Landsat 7	2007/07/31	30	U.S. Geological Survey
Landsat 7	2011/07/10	30	U.S. Geological Survey
Landsat 8	2015/07/13	30	U.S. Geological Survey
Landsat 8	2019/07/08	30	U.S. Geological Survey
Landsat 8	2023/07/27	30	U.S. Geological Survey

A combination of channels 7-5-4 of Landsat 7 space images and a combination of channels 7-6-5 of Landsat 8 space images were built (Figure 3). The shorelines, selected site, are clearly defined by built images. Open soil (yellow), open water (black) and plants (blue) area are also apears on images. Currently, ENVI and ArcGIS programs are used to process multispectral raster images, which have a special add-on for studying shorelines.

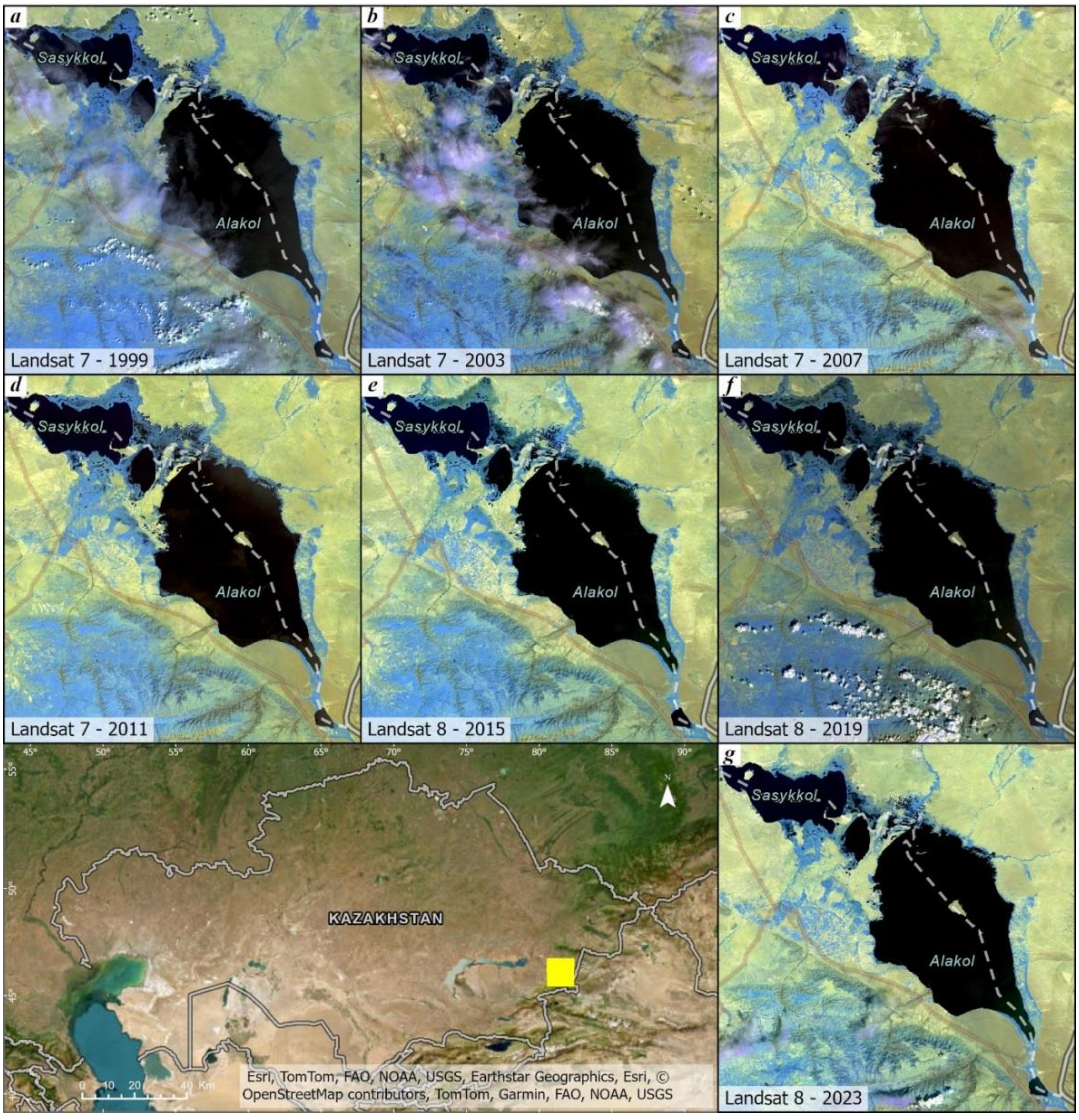


Figure 3. Combination of Landsat 7 7-5-4 satellite images and combination of Landsat 8 7-6-5 satellite images a) 1999; b) 2003; c) 2007; d) 2011; e) 2015; f) 2019; g) 2023

The satellite images were first processed using the visual decoding method. The water-land boundary in the study material is clearly defined due to the reflective properties of the water surface in the combination used in the Landsat

bands.Shorelines from 1999, 2003, 2007, 2011, 2015, 2019 and 2023 were identified using an unsupervised classification method (Baban, 1997) (Figure 4). This type of classification is based on the characteristics of pixels in a space image by grouping pixels with similar static properties into clusters. Two clusters were identified from the imagery and converted to a linear feature to highlight the shoreline (Daniels, 2012). These shorelines were processed using the DSAS tool, and the indicators Net Shoreline Movement (NSM), Shoreline Change Envelope (SCE), End Point Rate (EPR), and Linear Regression Rate (LRR) were determined (US Geological Survey, 2018). The NSM measures the total shoreline movement between the earliest and latest shoreline positions, while the SCE captures the maximum shoreline displacement.

The EPR represents the rate of shoreline change based on the distance between two shorelines, and the LRR calculates a trend of shoreline movement over time. To compute these indicators, a perpendicular transect was drawn from each shoreline to a predefined baseline. The baseline was created in ArcGIS by merging shorelines from 1999 to 2023 and applying a buffer tool to smooth variations and establish a reference line (ArcGIS, 2019). This method ensures consistency when measuring shoreline displacement. The DSAS tool then generated the NSM, SCE, EPR, LRR, and Weighted Linear Regression (WLR) indicators at each transect. In this study, perpendicular transects were spaced every 200 m, and measurements were taken up to 1500 m from the baseline to capture regional shoreline trends (Fig. 3). These distances were chosen to balance spatial resolution and computational efficiency while ensuring comprehensive shoreline analysis.

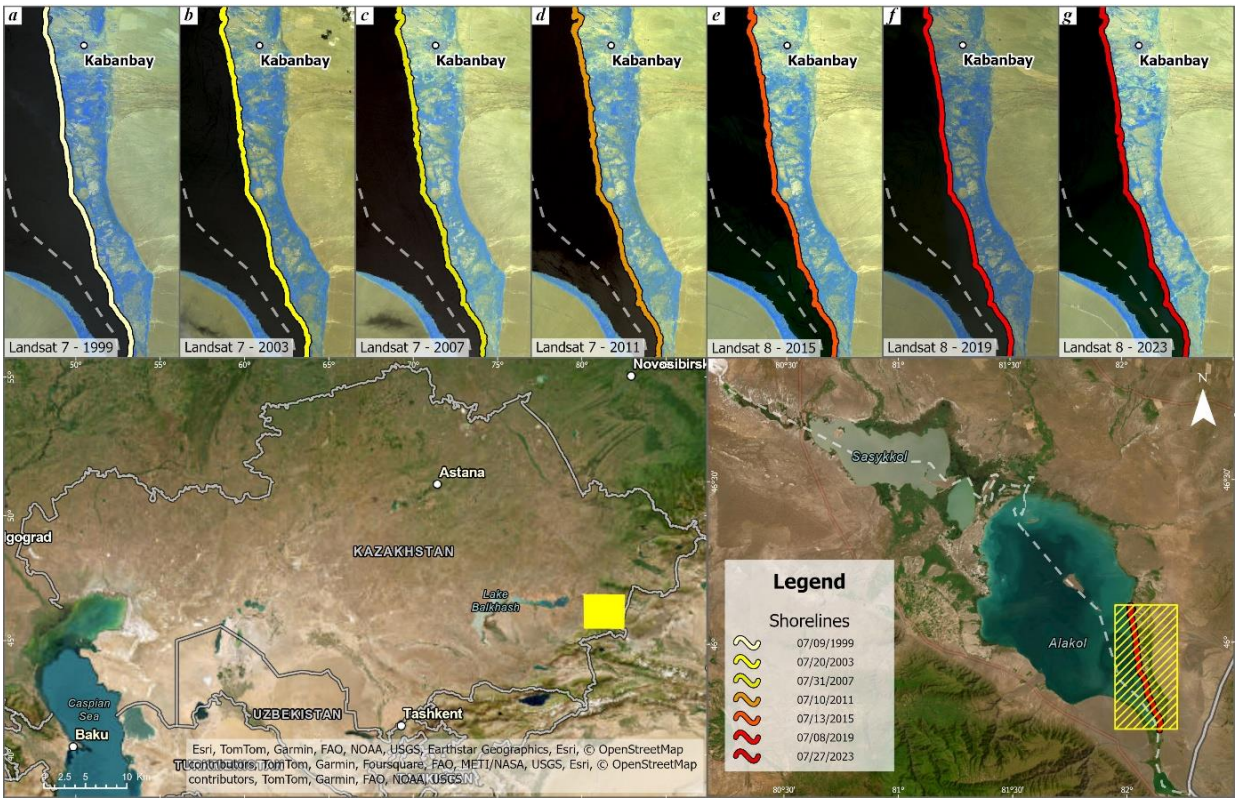


Figure 4. Shorelines identified from Landsat satellite imagery a) 1999; b) 2003; c) 2007; d) 2011; e) 2015; f) 2019; g) 2023

The identified shorelines were analyzed using the methods outlined in the table below.

Table 2. Description of indicators used in the study of shoreline change dynamics

DSAS statistics	Definition
NSM	Net Shoreline Movement is the distance between the oldest and most recent shoreline
SCE	Shoreline Change Envelope – indicates the distance between the closest to the farthest shoreline with reference to the baseline as observed within the temporal horizon
EPR	End Point Rate – is simply the Net Shoreline Movement divided by the time interval
LRR	Linear Regression Rate – is used to show the long-term rate of shoreline change.
WLR	Weighted Linear Regression – provides the best-fitted line for the linear rate of change by considering the uncertainty value

EPR (End Point Rate) – End Point Rate was calculated by dividing the distance of shoreline travel by the elapsed time between the oldest and most recent shoreline (Sam & Gurugnanam, 2022). By calculating the value of the movement of the point of intersection with the perpendicular drawn from the shoreline to the baseline, the LRR index was determined, and it indicates the annual change of the shoreline (m/year). The indicators of NSM, EPR, SCE used in determining the dynamics of the change of this shoreline are closely related to each other (Figure 5).

$$\mathrm{EPR} = \frac{\mathrm{NSM}}{\textit{the time between the oldest and the most recent shoreline}}$$

where, EPR: Represents the annual rate of shoreline movement, either erosion or accretion, measured in meters per year (m/year); NSM: Refers to the total distance between the position of the oldest shoreline and the most recent shoreline along a given transect. This is measured in meters (m).



Figure 5. Interrelationship of NSM, EPR, SCE indicators, NSM = distance between oldest and latest shoreline (m), SCE= distance between two extreme shorelines (m)

RESULTS AND DISCUSSION

1999, 2009, 2019, obtained by classifying satellite images using special tools built into ArcGIS, long-term data analysis was carried out (Fatih & Durduran, 2016; Emran et al., 2016): The area of selected areas of abrasion and consolidation was calculated, and the rate of shore retreat in selected areas was estimated.

According to the determined NSM, the maximum shoreline change towards land was a value of about 280 meters (Figure 6). On the contrary, the change of shoreline towards water showed a value of about 80 meters. According to the NSM, the distance between the oldest and the latest shoreline or the direction of net shoreline movement was toward land.

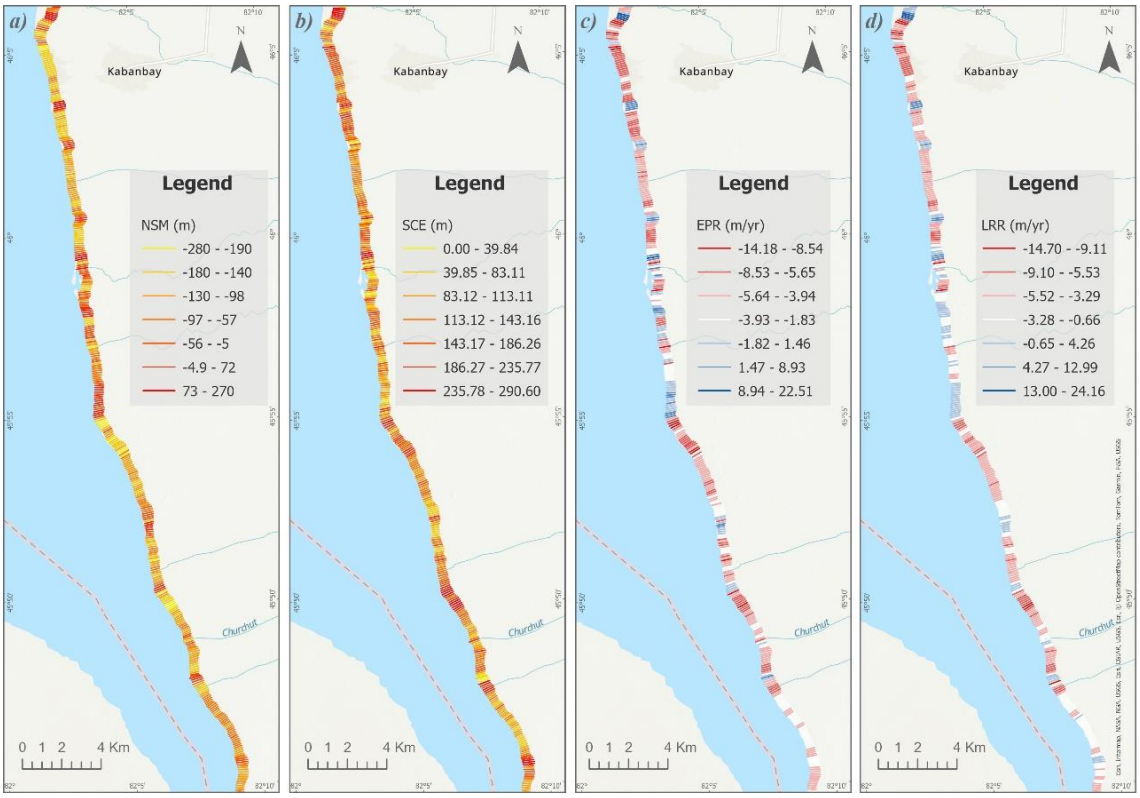


Figure 6. a) NSM, b) SCE, c) EPR and d) LRR indicators of the eastern shore of Lake Alakol

The SCE's measurements showed that the longest distance of 235-290 metres corresponded to the area of recreational facilities in the village of Kabanbay on the eastern shore of Lake Alakol. According to the EPR indicator, the annual change of the shoreline near the village of Kabanbay had a high index value of -14.18 - - 8.54 m compared to other regions.

The analysis of the WLR rates across 463 transects reveals valuable insights into shoreline dynamics. The overall average rate of shoreline changes stands at -2.67 meters per year, indicating a predominant erosional trend (Figure 6). However, this average rate comes with a notable uncertainty of ±0.66 meters per year, calculated based on a reduced number of independent transects (n=54). Among the transects, 82.51% exhibit erosional behaviour, with an average erosion rate of -3.95 meters per year. This erosional trend is further emphasized by the fact that 55.08% of all transects demonstrate statistically significant erosion, with the most significant erosion observed at -14.7 meters per year on Transect ID 28. Conversely, 17.49% of the transects display accretional behaviour, albeit at a lower frequency. Despite this, only 2.16% of transects show statistically significant accretion, with the highest accretion rate recorded at 24.16

meters per year on Transect ID 22. These findings underscore the dynamic nature of coastal environments, with erosional processes dominating over accretional ones in this study area (Figure 7).

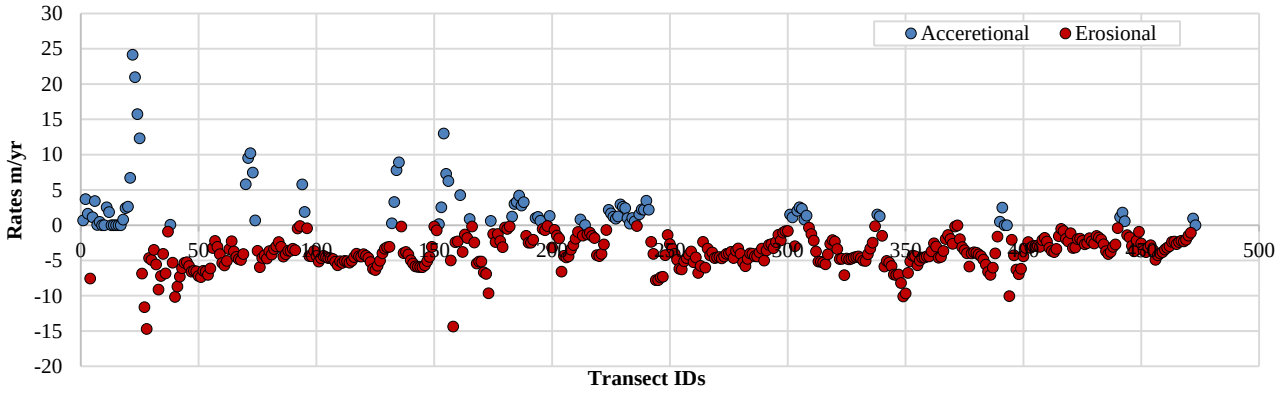


Figure 7. WLR rates along transect

The distance of the shoreline from the baseline has fluctuated over time, with the most recent measurement in 2023 showing (Figure 8) a distance of 169.76 meters, while in 1999 it reached its peak at 306.61 meters.

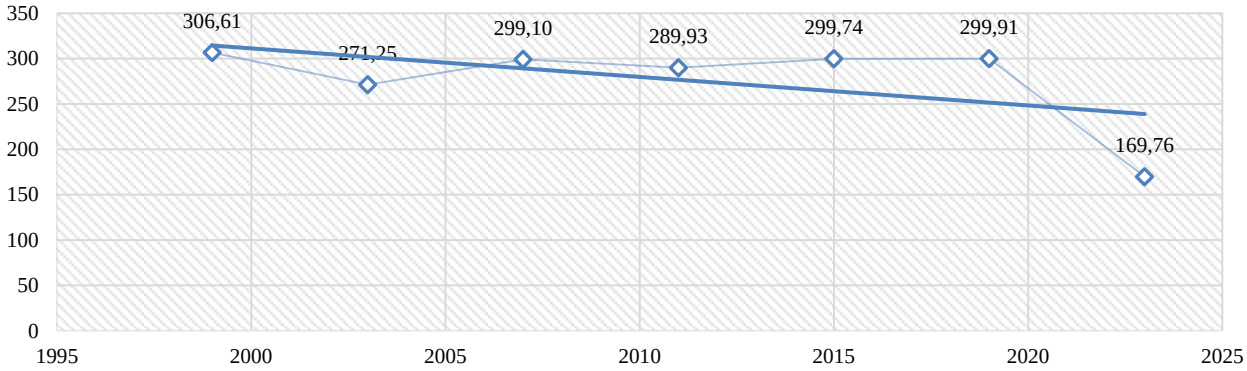


Figure 8. Changes in the distance of the shoretline from the baseline

The analysis of shoreline changes conducted on the dataset extracted from DSAS Summary Transects reveals significant insights into the coastal dynamics of the studied area. Various rate types were examined, including SCE, NSM, EPR, and LRR. Transects were spaced at 100-meter intervals, with a smoothing distance of 2500 meters. The analysis, conducted with a confidence interval of 90 and default uncertainty of 10, revealed both erosional and accretional trends. EPR indicated an average erosional rate of -3.68 meters/year, with 89.01% of transects exhibiting erosion and 10.99% exhibiting accretion. LRR showcased an average erosional rate of -2.67 meters/year, with 82.51% of transects displaying erosion and 17.49% displaying accretion. These findings provide valuable insights for coastal management and conservation efforts in the studied region. Wind conditions and waves have a great influence on the formation of the coast (Velichko & Spasskaya, 2002). Wave power is considered to be the main factor affecting the change of the Alakol lake shoreline (Mikhailova & Loginovskaya, 2012). The wave height of Lake Alakol during the hurricane season reaches 9-10 meters. This poses a serious threat to the territory where the recreation area is located, and there is a high risk of erosion of roads and recreation centers. The main force of this wave is the wind.

The results of this study underline several key advantages of the project. One of the most significant is the direct relationship between its findings and the potential for sustainable tourism development in the Alakol Lake region. By identifying critical erosion risks and shoreline dynamics, the project supports the strategic planning of tourism infrastructure and recreational areas, ensuring their resilience and appeal for future visitors. Moreover, the integration of this project with other regional and national initiatives—such as ecological monitoring programs, tourism development plans, and innovative remote sensing applications—creates a cohesive framework for addressing environmental challenges. This synergy will enable the adoption of cutting-edge technologies and methodologies, amplifying the impact of this research and fostering long-term regional growth. The findings of this study highlight the significant changes in shoreline dynamics along the eastern coast of Lake Alakol, with implications for both environmental management and regional development. The predominant trend of shoreline retreat towards land reflects the combined influence of natural processes such as wave action, wind dynamics, and geological factors. This underscores the importance of understanding the interaction between these variables to design effective strategies for shoreline protection.

One of the key takeaways from this study is the vulnerability of critical recreational areas, such as the village of Kabanbay, which are central to the region's tourism economy. The high erosion rates observed near this area not only threaten infrastructure but also pose a challenge to sustainable tourism development. Proactive measures, including the implementation of coastal protection infrastructure and ecosystem-based solutions, are essential to mitigate these risks.

For example, integrating vegetative barriers and reinforcing natural features along the shoreline can provide cost-effective and environmentally friendly alternatives to traditional methods of erosion control.

The study also emphasizes the value of advanced remote sensing technologies, such as the DSAS, in monitoring and analyzing shoreline changes. The ability to process and visualize long-term data using satellite imagery enables researchers and policymakers to make informed decisions regarding environmental conservation and development planning. While this approach offers significant advantages in terms of cost-efficiency and scalability, it is important to address the limitations of lower-resolution satellite data by incorporating high-resolution imagery and other advanced geospatial tools in future studies. Another important aspect is the potential for cross-border collaboration with China, given the proximity of Lake Alakol to the Chinese border. Environmental challenges in the region, such as shoreline erosion, are not confined to national boundaries and call for cooperative approaches to address shared ecological and hydrological systems. Joint initiatives with Chinese institutions could enhance data sharing, resource management, and the development of innovative solutions to mitigate environmental risks. This study also sheds light on the need to align shoreline management with broader regional goals, including sustainable tourism and biodiversity conservation. Lake Alakol's unique natural features and its role as a key recreational hub for Kazakhstan present an opportunity to promote eco-friendly tourism initiatives. Incorporating nature-based tourism activities that focus on the lake's biodiversity and landscape can simultaneously enhance visitor experiences and support conservation efforts. Additionally, integrating this project with other regional initiatives, such as water resource management and climate resilience planning, can create a synergistic framework for sustainable development.

CONCLUSION

In conclusion, this comprehensive study of shoreline dynamics along the eastern coast of Lake Alakol, situated near the border of Kazakhstan and China, has provided valuable insights into the complex interactions between environmental factors and coastal processes. By analyzing satellite imagery and applying advanced GIS tools such as DSAS software, significant changes in shoreline morphology and behavior have been identified over the studied period.

The findings revealed a predominant trend of shoreline retreat towards land, with erosional processes outweighing accretional ones. High rates of erosion, particularly near the village of Kabanbay, underscore the vulnerability of coastal areas to environmental changes and the urgent need for effective management strategies. The influence of wind conditions and wave power on shoreline dynamics further emphasizes the importance of incorporating these factors into coastal planning and conservation efforts. Beyond coastal management, these results hold significant implications for the development of sustainable tourism in the region. Protecting the natural assets of Lake Alakol, such as its unique shoreline and recreational areas, is essential for ensuring the long-term viability of tourism activities. By integrating this research with regional tourism planning, stakeholders can enhance visitor experiences while safeguarding the ecological integrity of the lake.

Future initiatives should prioritize the alignment of tourism development with conservation goals, incorporating nature-based tourism events and activities that highlight the lake's natural beauty and ecological significance. Moreover, the project serves as a foundation for integrating advanced technologies and methodologies into broader environmental monitoring and resource management initiatives. Given Lake Alakol's proximity to China, the findings also offer potential for cross-border collaborations on environmental protection and sustainable resource use. Continuous monitoring and collaborative efforts between policymakers, researchers, and local communities will be critical to ensuring the sustainability of the lake's ecosystem and its role as a key driver of regional economic growth. These actions will not only mitigate erosion risks but also pave the way for sustainable development that balances environmental conservation with socio-economic progress.

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THE ROLE OF CUSTOMER EXPERIENCE IN ENHANCING THE COMPETITIVENESS OF THE MOROCCAN TOURISM INDUSTRY: 'CASE OF: ESSAOUIRA & MARRAKECH'

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Abstract: This study investigates the role of Customer Experience (CX) in boosting the competitiveness of Morocco's tourism industry, focusing specifically on the destinations of Essaouira and Marrakech. The research explores how factors such as Service Interaction, Accommodation Quality, Attraction Accessibility, Customer Loyalty, and Tourist Satisfaction influence CX and, ultimately, contribute to a destination's overall competitiveness. Using a quantitative methodology, the study gathered data through 247 completed tourist questionnaires and applied factor analysis alongside statistical tests to evaluate the relationships among these variables. The findings reveal that Accommodation Quality has the strongest positive impact on CX, highlighting its fundamental role in enhancing tourist satisfaction and encouraging repeat visits. Service Interaction also emerged as a key influencer, underlining the importance of responsive and personalized services in developing customer loyalty. While Attraction Accessibility was generally rated positively, the responses revealed some variability, pointing to areas in need of improvement such as transportation infrastructure, signage clarity, and the availability of multilingual support. Interestingly, the study found that Customer Loyalty has a weaker direct influence on destination competitiveness compared to the other factors, suggesting that repeated visitation may be more dependent on satisfaction with the overall experience than loyalty alone. Tourist Satisfaction was shown to play a crucial mediating role, strengthening the link between CX and competitiveness by turning positive experiences into tangible advantages for the destination. These insights offer important implications for tourism stakeholders in Morocco, particularly regarding strategic investment in service excellence and infrastructure. The study recommends enhanced service training for frontline staff to ensure consistent and high-quality visitor interactions. It also highlights the potential of digital tools to deliver real-time, personalized recommendations, thereby increasing visitor engagement. Improvements in transport networks, clearer tourist signage, and multilingual information access are suggested as key infrastructure upgrades. These enhancements can bridge gaps in accessibility and improve the coherence of the tourist journey. If the focus is on quality-driven strategies and leveraging technology, Morocco can better meet tourist expectations and elevate its position in the global tourism market. In sum, this research supports a customer-centric approach as essential to sustainable and competitive destination development in the Moroccan tourism context.

Keywords: Customer experience, destination competitiveness, tourist satisfaction, African tourism Market, Morocco

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INTRODUCTION

Customer satisfaction is a critical aspect of the service industry, particularly in tourism, where the quality of services directly influences the overall experience of customers (Lemon & Verhoef, 2016). To maintain client satisfaction, service providers need to regularly evaluate their services based on customer feedback and make necessary enhancements (Ntlantsana et al., 2023). Nevertheless, the pursuit of customer contentment is met with distinctive hurdles stemming from the fundamental traits of services, like intangible qualities, inseparable nature, unpredictability, and transient nature (Lemon & Verhoef, 2016). Recent research highlights that Customer Experience in the hotel industry has become a critical focus area, with growing efforts to understand and improve the distinctive experiences delivered to guests (Veloso & Gomez-Suarez, 2023). Despite its importance, CX studies within the hospitality context remain fragmented, which emphasizes the need for further research to consolidate definitions, emerging trends, and models aimed at enhancing service delivery (Veloso & Gomez-Suarez, 2023). Monitoring customer expectations and perceptions is key for businesses to address challenges efficiently. Within the tourism sector, enhancing customer experience has become crucial for boosting the competitiveness of destinations (Chen et al., 2025). Throughout their journey, tourists come into contact with various touchpoints that make up the customer experience, from researching their trip to reflecting on it afterward (Lemon & Verhoef, 2016). Ensuring a remarkable and beneficial interaction may result in enhanced customer loyalty, positive feedback, and endorsements, all of which are essential for fostering revenue growth and upholding a competitive position

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(De Souza et al., 2020). The idea of destination competitiveness and the factors that influence it remain a key focus in tourism research, drawing significant interest from scholars and practitioners alike (Dwyer, 2022).

Customer experience encompasses all aspects of how a customer views their interactions with a company, sparking emotional, physical, and social reactions (Lemon & Verhoef, 2016). In contrast, customer satisfaction is a measure of how well a product or service meets or surpasses customer expectations (Lemon & Verhoef, 2016). Customer experience is integral to establishing and maintaining the competitiveness of a destination. In today's digital age, where consumers have endless options at their fingertips, delivering outstanding customer experiences is crucial for standing out in a crowded marketplace and ensuring long-term success (Joppe, 2016). In the business context, companies that excel in delivering positive customer experiences are more likely to foster customer loyalty, increase brand awareness, and differentiate themselves from competitors. Likewise, destinations that succeed in enhancing their customer experience have the ability to forge a memorable image in the eyes of potential visitors. If a destination does not establish a unique identity, it can experience increased competition from other attractive destinations, confusion among marketers about the needs and preferences of their target audience, and a lack of clarity about the opportunities available at the destination (Zhou et al., 2024).

The research was conducted in Morocco, a perfect destination in the African continent with important numbers and statistics positioning itself as the second most visited destinations in the continent reaching 14,5 million international arrivals in 2023 of which 9,6 million international arrivals from airports as well as reaching the 22 nd position worldwide after gaining 12 positions from 2019 till 2022 according to the ministry of tourism report (2024). During the first six months of this year (2024), Morocco experienced a 14% rise in tourist arrivals, totaling 7.4 million visitors, as reported by the tourism ministry. In 2023 and as mentioned before, the nation welcomed a record-breaking 14.5 million tourists and has set a goal to attract 17.5 million by 2026 and 26 million by 2030, aligning with its upcoming co-hosting of the World Cup with Spain and Portugal. Tourism continues to be a crucial industry for Morocco, making up 7% of the country's GDP and serving as a significant source of foreign currency according to Eljechtimi & Boyle 2024.

Although customer experience is widely acknowledged as crucial, there is a lack of research on how customers perceive service quality in the Moroccan tourism sector, especially in popular destinations like Essaouira and Marrakech. These cities are among the top 4 most visited in the country, making them perfect for studying how customer experience affects destination competitiveness. This study seeks to explore how improving customer experience can boost the competitiveness of the Moroccan tourism industry through different regions. It aims to offer valuable insights and recommendations for service providers to enhance their services and meet the changing demands of tourists.

LITERATURE REVIEW

Customer experience is the overall impression customers have of a business or service based on their interactions at different points during their journey. Lemon & Verhoef (2016) explain that CX involves emotional, cognitive, and behavioural reactions that result from using a product or service, impacting customer satisfaction and loyalty. On the other hand, in the tourism industry, a destination's competitiveness depends on its ability to offer experiences that meet or exceed visitor expectations, leading to repeat visits and positive recommendations. A destination's competitiveness is the capacity of a destination to provide exceptional experiences while also preserving resources for future generations. It is emphasized that factors like destination appeal, infrastructure, and service quality are essential for ensuring long-term success in the global tourism market (Ritchie & Crouch, 2000). Due to these two aspects, the Moroccan tourism industry has witnessed significant growth over the years, positioning the country as a popular destination for both leisure and cultural travelers. Customer experience is a crucial distinguishing factor, particularly in a highly competitive tourist zone. Aware of this imperative, hotels in Essaouira and Marrakech, as well as throughout Morocco, have made customer experience their battleground. It is a central priority to which Moroccan hotels attach immense importance, placing it at the heart of their development strategy.

Customer experience in tourism

Customer experience is an important concept in the tourism sector, influencing how visitors perceive and interact with the destination and its services. It includes all of the encounters that a tourist experiences during their travel, from initial planning and booking to actual visit and post-trip review. Because customer experience is holistic, it involves both tangible characteristics, such as lodging quality and transit convenience, as well as intangible factors, such as emotional responses to cultural engagement and service interactions. CX has been highlighted as a key driver of satisfaction, loyalty, and destination competitiveness. Positive experiences can lead to return visits and favorable word-of-mouth referrals (Pizam & Holcomb, 2007; Pine & Gilmore, 1998). In tourism, the quality of the customer experience affects not only individual businesses but also the overall perception of a destination. Tourists frequently share their experiences online via reviews, blogs, and social media, so a single negative experience can have far-reaching consequences, perhaps discouraging future trips (Toral et al., 2017). As a result, tourism operators and destinations must focus on providing great service at all stages of the consumer journey. This includes assessing tourist needs and expectations, monitoring service quality, and always improving the entire visitor experience. The "experience economy," defined by Pine & Gilmore (1998), has gained traction in tourism, with destinations now viewed as venues for producing distinctive and individualized experiences that go beyond traditional service delivery.

According to academic literature, CX in tourism is multidimensional, including cognitive, emotive, social, and sensory components (Tung & Ritchie, 2011). Cognitive factors refer to the practical aspects of travel, such as logistics, pricing, and information accessibility, whereas affective components refer to the emotions and sentiments evoked by the destination. Social elements include contacts with other customers, locals, and service providers, which can either enhance or detract from the overall experience. Sensory experiences are linked to the actual environment, such as the

sights, sounds, and even scents of a location, and can leave an indelible memory. Recent studies have stressed the importance of digital technology in affecting customer experiences in tourism. With the rise of social media, online reviews, and mobile applications, tourists are increasingly relying on digital tools not only to plan their trips but also to improve their experiences while visiting (Neuhofer et al., 2014). These digital interactions enable real-time service upgrades and individualized offerings, which can greatly boost overall satisfaction.

Furthermore, feedback obtained through digital media helps tourism managers identify areas for service improvement and rethink their offers according to Buhalis & Amaranggana (2014). Thus, incorporating digital engagement into the customer journey is critical for destinations seeking to remain competitive in the changing tourism industry.

Customer Experience Determinants Model (CEDM)

The Customer Experience Determinants Model (CEDM) as seen in "Fig1" provides a structured and analytical framework to explore the key factors that influence customer experience in the tourism industry. The model highlights Customer Experience as a central construct, shaped by four critical determinants: Service Interaction, Accommodation Quality, Attraction Accessibility, and Customer Loyalty, while also incorporating the role of Tourist Satisfaction as both an influencing and outcome variable. By focusing on these dimensions, the CEDM underscores the complex interplay between these factors and their cumulative impact on CX, offering a comprehensive approach to understanding and improving the quality of experiences for tourists. At the core of the model is the understanding that Customer Experience is not a singular concept but rather a multidimensional construct that encapsulates emotional, sensory, and functional elements of a tourist's journey. The CEDM positions Service Interaction as a critical determinant (H1), reflecting how personalized, responsive, and empathetic engagement with service providers enhances the overall experience. Positive service interactions foster trust and create emotional connections, making them a cornerstone of an enriched CX. Accommodation Quality (H2) represents another key determinant, emphasizing the role of tangible and intangible aspects such as cleanliness, comfort, design, and staff professionalism. Superior accommodations not only fulfill tourists' basic expectations but also provide an environment conducive to relaxation and enjoyment, significantly enhancing their perception of the destination. This determinant aligns with research suggesting that accommodation is a pivotal touchpoint in shaping overall satisfaction and loyalty. The third determinant, Attraction Accessibility (H3), highlights the importance of ease of access to key attractions, including transportation, signage, and infrastructure.

Accessibility directly impacts the convenience and usability of tourist destinations, influencing how tourists navigate and engage with a destination. When accessibility meets or exceeds expectations, it leads to a seamless experience, which strengthens CX. Additionally, Customer Loyalty (H4) is presented as both a consequence of positive CX and a determinant that reinforces the overall experience. Loyal customers, often shaped by prior positive interactions, engage more deeply with the destination, creating a feedback loop that enhances the perceived value of their journey. Loyalty also encourages tourists to interact more frequently with various service providers, contributing further to an elevated CX. Finally, Tourist Satisfaction (H5) is conceptualized as a dual-role variable in the model. It not only acts as a dependent variable influenced by CX but also significantly affects the perception of the customer experience itself. This reciprocal relationship creates a dynamic feedback mechanism, where heightened satisfaction reinforces the elements of CX, leading to consistent improvements in service delivery, accommodations, and accessibility.

The analytical strength of the Customer Experience Determinants Model (CEDM) lies in its ability to integrate these determinants into a cohesive framework. The model facilitates the identification of the most impactful areas for intervention, enabling tourism stakeholders to prioritize investments in service quality, accommodation standards, and infrastructure development. Furthermore, by incorporating both behavioural and emotional aspects of CX, the CEDM provides a balanced perspective that aligns with the experiential nature of tourism. In conclusion, the CEDM is an important tool for analyzing the factors influencing customer experience in tourism. It provides actionable insights for enhancing satisfaction, fostering loyalty, and driving long-term success in the competitive global tourism market. By addressing the determinants of CX in a holistic manner, the model offers a roadmap for destinations to design and deliver memorable, high-quality experiences that resonate with diverse tourist expectations

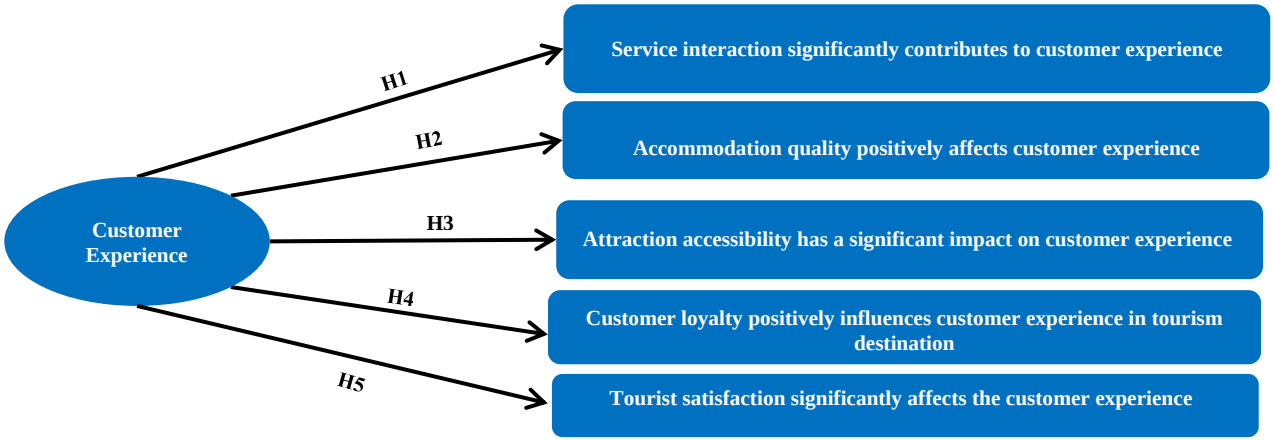


Figure1. Customer experience determinants model (CEDM) (Source: Made by authors based on literature)

Studies have shown that service quality not only affects tourists' immediate satisfaction but also influences their likelihood of returning to the destination and recommending it to others (Hui et al., 2007).

Ensuring high-quality service across diverse tourism sectors, from luxury resorts to traditional guesthouses (riads), is essential for Morocco's sustained success in a competitive tourism industry.

Hypothesis Development: Linking Customer Experience Variables to Tourism Competitiveness

Based on the literature review findings, five hypotheses were created to investigate the elements influencing Customer Experience and their impact on tourism destination competitiveness. These hypotheses are based on theoretical frameworks and empirical investigations that demonstrate the importance of each factor in shaping tourist satisfaction and destination competitiveness.

H1: Service interaction significantly contributes to customer experience

Previous studies have highlighted the relevance of service interaction in shaping customer experience. Service quality and personal contacts between personnel and tourists have a big impact on satisfaction, as they are frequently critical touchpoints during a tourist's visit. For example, Meyer & Schwager (2007) argue that the quality-of-service interactions has a direct impact on a visitor's overall pleasure, which can lead to increased loyalty and positive word-of-mouth. Furthermore, Zeithaml et al. (1990) suggest that responsive and customized service improves consumer perceptions, leading to higher satisfaction and the possibility of return visits, hence boosting the destination's competitiveness.

H2: Accommodation quality positively affects customer experience

Research has consistently proven that good accommodation improves tourists' overall satisfaction with a site. Pizam & Holcomb (2007) argue that factors such as comfort, cleanliness, and amenities have a direct impact on consumer perceptions of a place. Pine & Gilmore (1998) suggest that accommodations contribute to the overall tourism experience by providing personalized services that increase the perceived value of a stay. The quality of accommodation is thus closely related to greater satisfaction and loyalty, strengthening a destination's position in a competitive market.

H3: Attraction accessibility has a significant impact on customer experience

Attraction accessibility plays a key role in enhancing the overall tourist experience. Neuhofer, Buhalis, & Ladkin (2014) discuss how the ease of access to local attractions can influence tourists' satisfaction, emphasizing that a well-connected destination offers a more convenient and enjoyable experience. Tung & Ritchie (2011) also assert that clear signage, easy transport links, and the availability of information about attractions improve tourists' engagement and emotional satisfaction, which in turn strengthens the destination's competitiveness. The ability to easily access and enjoy attractions contributes to repeat visits and positive recommendations, increasing the destination's appeal in a competitive market.

H4: Customer loyalty positively influences customer experience in tourism destination, with satisfied customers being more likely to recommend and revisit, thus driving long-term growth.

H5: Tourist satisfaction significantly affects the customer experience

Satisfaction plays a pivotal role in shaping the overall customer experience. When tourists are satisfied, their perceptions of the destination are enhanced, which results in greater loyalty and positive word-of-mouth. Moreover, satisfaction influences tourists' emotional reactions and expectations, making it a key driver of their overall experience and likelihood to return or recommend the destination to others. These hypotheses are derived from the theoretical frameworks and empirical findings in the literature and are tested in the following parts to explore their validity in the context of tourism competitiveness.

METHODOLOGY

A quantitative approach was essential for this research because it provided a systematic way to measure and analyze the role of customer experience and how it could be used to enhance the competitiveness of the Moroccan tourism. Using questionnaires enabled the collection of numerical data on key factors such as service interactions, accommodation quality, attractions quality and accessibility and loyalty.

This approach allowed for statistical analysis to identify significant patterns and relationships, helping to quantify the impact of customer experience on tourists' likelihood to recommend and return to these destinations.

Questionnaire Design

The questionnaire was specifically designed to investigate four key factors impacting customer experience in the tourism industry: interaction with services, accommodation quality, attractions quality and accessibility as well as loyalty. These factors were chosen based on their established importance in the literature on tourism experiences. The questionnaire was structured to measure each factor through a combination of closed-ended and open-ended questions, allowing for both quantitative analysis and qualitative insights. Furthermore, the questionnaire was available in both French and English to ensure inclusivity and accessibility. Numerous studies have emphasized the relevance of crucial factors in defining the customer experience in the tourism industry. Service interaction, for example, is important in determining customer happiness and loyalty. Meyer & Schwager (2007) as well as Lee-Anant & Rungreaung (2024) emphasize that high-quality customer service and effective staff interactions directly improve a tourist's experience, resulting in increased satisfaction and return visits. Similarly, Zeithaml et al. (1990) emphasize the importance of service delivery and staff responsiveness in influencing customer impression and loyalty.

Accommodation quality is also crucial, according to Pizam & Holcomb (2007) as well as Müller et al. (2024), who claim that fulfilling or exceeding tourists' comfort and cleanliness standards leads to better satisfaction and a higher possibility of return visits. Pine & Gilmore (1998) underline that individualized accommodations improve the whole

experience and increase perceived value. Another important component is attraction accessibility; according to Neuhofer et al. (2014), quick access to attractions and good communication through digital platforms improve visitor happiness. Tung & Ritchie (2011) argue that offering clear signs and relevant information promotes engagement and emotional pleasure. Finally, Hui et al. (2007) highlight loyalty as a crucial outcome of great customer experiences, demonstrating that tourists who are satisfied with their service interactions and accommodation are more likely to return and recommend destinations. Similarly, De Souza et al. (2020) show that customer loyalty, as measured by satisfaction, is critical to retaining a destination's competitive edge. For the quantitative aspect, Likert scale questions were employed to assess participants' perceptions and satisfaction levels concerning the four factors, while multiple-choice questions captured demographic information and travel history. The use of a Likert scale enabled the measurement of attitudes and satisfaction in a standardized manner, which facilitated the analysis of relationships between variables.

For example, questions on accommodation quality asked participants to rate their satisfaction on a five-point scale, ranging from "Very Unsatisfied" to "Very Satisfied." Similarly, questions regarding interaction with services and attractions focused on the quality and authenticity of these experiences. The qualitative dimension was addressed by including open-ended questions, which encouraged participants to elaborate on particular aspects of their trips that exceeded or fell short of expectations. This approach provided deeper insights into areas for improvement in customer experience that might not be fully captured by closed-ended questions.

Data Collection

The use of a questionnaire as the primary data collection tool was ideal due to its ability to gather large amounts of information quickly and efficiently from a diverse sample of tourists. It enabled the collection of standardized data, which is crucial for quantitative analysis, while also offering the flexibility to include qualitative questions. Data collection took place during the summer months, a peak tourist season, allowing for the direct engagement with tourists at the time of their visit. This timing ensured the relevance and accuracy of responses, as participants were able to reflect on their experiences immediately. Out of the 284 responses received, 247 were deemed relevant for analysis after cross-checking. The exclusion of 37 responses was due to incomplete data, such as missing demographic information or unanswered core questions, which could potentially bias the analysis.

By focusing on the 247 completed questionnaires, the study ensured the reliability of the results while maintaining a sufficiently large sample size for statistical analysis. The decision to focus on the 247 relevant responses from the total of 284 received was primarily influenced by time constraints and resource limitations. Given that the data collection was conducted face-to-face with tourists, there were practical challenges in reaching a larger sample size, including the availability of respondents and the time required to administer the questionnaires in person.

The face-to-face approach was necessary to ensure a high response rate, and the quality of data collected, but it also limited the number of participants that could be feasibly included within the available timeframe and resources. Thus, the final sample size of 247 represents a balance between obtaining a sufficient number of responses for meaningful statistical analysis and managing the logistical constraints of in-person data collection.

Sample Area

Essaouira and Marrakech were picked for this study because they are important places in the Marrakech-Safi area, known as a top tourist spot in Morocco. Recent air traffic numbers for 2023 highlight the area's importance in the tourism sector of Morocco. Marrakech Ménara Airport, which is centrally located in the region, made up 22% of all air arrivals, making it the busiest airport for international tourists. This table highlights Marrakech's status as a leading destination in the country, especially considering its role as a cultural and historical hub, as well as its appeal as a luxury tourism hotspot. In comparison, during the same period, Mohammed V Airport in Casablanca, the main international gateway to Morocco, managed 16% of air arrivals. While it maintains an important role in facilitating long-haul international flights, the data reveals that Marrakech has significantly outpaced Casablanca in terms of direct tourist arrivals, especially in the post-COVID era.

Table 1. Evolution by point of entry of tourist arrivals at border posts (Source: Ministry of Tourism https://mtaess.gov.ma/fr/tourisme/chiffres-cles/)

	2019	2020	2021	2022	2023	Var 23/22	part 2023
T.AIR	**9,081,490**	**2,265,090**	**3,461,151**	**7,546,893**	**9,614,669**	**27%**	**66%**
A Marrakech Ménara	3,093,694	657,343	685,043	2,356,441	3,254,555	**38%**	**22%**
A Mohammed V	2,527,306	716,387	1,196,362	1,958,858	2,295,893	**17%**	**16%**
A Agadir Almassira	874,336	194,983	187,618	736,033	944,164	**28%**	**7%**
A Tanger Ibn Battouta	697,941	190,007	361,917	599,973	789,147	**32%**	**5%**
A Fes-Saiss	574,188	162,607	281,820	572,068	705,630	**23%**	**5%**
A Rabat-Salé	462,914	104,383	194,555	347,633	450,792	**30%**	**3%**
A Laaroui	354,843	117,353	253,218	379,752	452,355	**19%**	**3%**
A Oujda	291,963	69,484	205,064	363,812	382,540	**5%**	**3%**
A Essaouira	60,559	19,236	13,574	47,216	87,612	**86%**	**1%**
A Oaurzazate	45,003	10,054	9,426	23,343	51,550	**121%**	**0%**
A Al Hoceima	36,656	6,143	20,833	33,103	36,464	**10%**	**0%**

Agadir Al Massira Airport, another key hub for Morocco's tourism sector, particularly known for its beach resorts and coastal tourism offerings, handled 7% of the total air arrivals. Despite being a major player in the country's coastal tourism

market, its traffic is comparatively lower than Marrakech's, suggesting that while Agadir remains a vital tourism destination, Marrakech holds a greater appeal for international visitors. The data from these three airports, as depicted in Table 1, clearly illustrate the regional dominance of Marrakech-Safi in Morocco's tourism sector, especially in the context of the post-pandemic recovery of the tourism industry. This dominance also aligns with the region's extensive infrastructure development, marketing strategies, and the growing appeal of both cultural and modern tourism experiences in Marrakech and Essaouira. These airports and their respective traffic data reflect not only the growth and recovery of tourism in the region but also the sustained competitiveness of Marrakech as a top destination in Morocco.

According to The ministry of Tourism (2024), the region's strong performance is further highlighted by the growth in tourist arrivals, with a 38% increase in air traffic at Marrakech Ménara from 2022 to 2023, outpacing the growth rates at other major airports such as Mohammed V (17%) and Agadir Al Massira (28%). This upward trend reflects the region's appeal, with Marrakech serving as a major tourist hub attracting visitors for its diverse offerings, while Essaouira has become a vibrant city renowned for its cultural festivals and rising status as a filming location.

Data Analysis

The data collected from the structured questionnaires was analysed using SPSS version 27. Factor analysis was conducted to identify the main factors influencing customer experience and their impact on enhancing destination competitiveness. Additionally, a sample t-test was performed to determine which variables were significant in shaping customer experience, helping to identify which factors had the most impact. Composite reliability and Average Variance Extracted (AVE) were calculated to ensure that the items and questions used in the survey were accurately measuring the intended concepts. These statistical techniques provided a robust framework for understanding the key drivers of customer experience in the tourism sector. Factor analysis, commonly employed in a wide range of studies, is a reliable method for examining the structure of latent variables and ensuring measurement validity.

For example, Kareem et al. (2024) used factor analysis in their research on the relationship between dynamic capabilities and firm competitive performance, highlighting its importance in assessing the reliability of constructs such as innovation capabilities and performance metrics. The study demonstrated that through factor loadings and reliability metrics, including AVE and Cronbach's alpha, factor analysis ensures robustness and accuracy of research findings. Similarly, Jung & Baloglu (2025) as well as Tsai et al. (2024) employed Confirmatory Factor Analysis (CFA) to test the validity and reliability of their measurement model, ensuring the constructs used in their study align closely with theoretical expectations. This approach, widely adopted across disciplines, solidifies the importance of factor analysis in advancing empirical research in the field.

RESULTS AND DISCUSSION

As seen in Table 2, the gender distribution reveals an imbalance, with females (n = 146, 59.11%) outnumbering males (n = 101, 40.89%), suggesting that subsequent analyses may be more representative of the female demographic, potentially introducing gender bias if generalizations to a broader population are made. In terms of age distribution, the sample is segmented into four categories: **18–24, 25–34, 35–54**, and **55+** years. The 35–54 age group constitutes the largest portion of the sample, representing 40.89%, followed by the 25–34 age group with 27.53%. The youngest age group (18–24) comprises 14.57%, while the oldest age group (55+) accounts for 17.01%. This indicates that the sample is predominantly middle-aged, with younger and older age groups less represented.

In terms of education, the vast majority of respondents (78.14%) have a university-level education, while only 21.86% possess a high school education. This shows that the sample population is largely composed of individuals with higher educational attainment. Such an educational profile could imply a more knowledgeable or informed respondent base, but it may also limit the generalizability of the findings to broader populations with more diverse educational backgrounds.

Table 2. Demographic characteristics of tourists (Source: Own research)

Items	**Male**	**Female**
Gender	101	146
	Percentage	
	40.89%	59.11%
Age	**N**	**Percentage**
18 – 24	36	14.57 %
25 – 34	68	27.53 %
35 – 54	101	40.89 %
+55	42	17.01 %
Total	**247**	**100%**
Education Level	**N**	**Percentage**
High School	54	21.86
University Education	193	78.14

The Exploratory Factor Analysis (EFA) (Table 3) conducted in this study plays a critical role in evaluating the constructs used to assess Customer Experience and its contributing factors in the tourism industry. This analysis helps uncover the underlying structure of the data by grouping items according to the factors they measure, and it provides insights into the strength of the relationship between each item and its corresponding construct.

Table 3. Exploratory factor analysis (Source: Own research)

Research Constructs	Items	Factors loading	A	CR	AVE
Service Interaction	How responsive were staff and how good was the customer service?	.678	.793	0.701	0.674
	How would you rate the overall quality of customer service you received?	.784			
	Did the staff provide personalized service to meet your specific needs?	.834			
	How well did the staff communicate and offer helpful information about local attractions?	.758			
	Was the staff available and attentive throughout your stay?	.727			
Accommo-dation Quality	Did the accommodation meet your expectations in terms of comfort and cleanliness?	.834	.883	0.831	0.779
	How would you rate the quality of the accommodation facilities?	.693			
	Did the staff provide personalized service to meet your specific needs?	.887			
	Were amenities (such as Wi-Fi, toiletries, etc.) sufficient and well-maintained?	.824			
Attraction Accessibility	How easy was it for you to access tourist attractions in the area?	.697	.821	0.759	0.862
	How accessible was information regarding nearby attractions?	.803			
	Did the accommodation or local services provide transportation options to attractions?	.752			
	Was signage and information about attractions provided in languages you understand?	.597			
Loyalty	Would you revisit Essaouira or Marrakech	.697	.786	0.626	0.890
	Would you recommend Essaouira or Marrakech to your family or friends?	.559			
	How likely are you to explore other tourist destinations in Morocco based on this experience?	.687			
	Do you feel a personal connection or attachment to the destination following your visit?	.792			
Tourist Satisfaction	How satisfied are you with your overall experience	.803	.910	0.745	0.741
	Did your experience meet or exceed your expectations	.863			
	How satisfied are you with attractions, accommodations, and services?	.869			
Customer Experience (CX)	How would you rate your overall experience during your visit to this destination?	.854	.891	0.922	0.746
	How satisfied were you with the overall quality of services provided during your visit?	.878			
	To what extent did your visit to this destination meet your expectations?	.860			

The factor loadings in the analysis reveal that most items are highly correlated with their respective constructs, indicating they are strong and effective measures of the intended constructs. For example, the Customer Experience construct, which is central to the study, contains items that exhibit strong factor loadings, demonstrating their strong association with the overall experience of tourists. Items such as “How would you rate your overall experience during your visit to this destination?” and “How satisfied were you with the overall quality of services provided during your visit?” have loadings of 0.850 and 0.870, respectively. These high loadings suggest that both items are reliable indicators of CX and are highly relevant to understanding tourists’ perceptions of their experience. Similarly, the Tourist Satisfaction construct also includes items with significant factor loadings. Items like “How satisfied are you with your overall experience?” and “Did your experience meet or exceed your expectations?” exhibit loadings of 0.863 and 0.869, respectively, demonstrating a robust relationship between these items and the satisfaction of tourists.

This indicates that satisfaction is effectively captured by these survey items, providing a solid foundation for measuring Tourist Satisfaction in the tourism context. However, some constructs show slightly weaker factor loadings. For example, Attraction Accessibility includes the item “Was signage and information about attractions provided in languages you understand?” which has a factor loading of 0.597. While this is above the minimum threshold for acceptability (typically 0.5), it is lower than other items within this construct. This suggests that the accessibility of information may not be as strongly perceived or may have inconsistencies, particularly in terms of multilingual support. The relatively low factor loading could indicate issues with language barriers or limited signage, which might detract from the overall accessibility of attractions for international tourists. This provides a valuable insight that might inform future improvements in infrastructure, such as better multilingual signage and clearer communication of available services.

The Composite Reliability (CR) values provide an additional measure of the internal consistency of each construct, indicating how reliably the items represent their respective constructs. As a general rule, a CR value above 0.7 is considered acceptable, and all constructs in this study exceed this threshold, further confirming the reliability of the measurement model (Fornell & Larcker, 1981). The Service Interaction construct shows a CR of 0.793, which is acceptable, suggesting that the items in this construct consistently measure the same underlying concept customer service quality. This is reinforced by high factor loadings on items related to personalized service and staff communication, both of which are key aspects of service interaction in tourism. The Accommodation Quality construct has a particularly high CR of 0.883, reflecting excellent reliability. This high CR value indicates that the items used to assess aspects of accommodation quality, such as comfort, cleanliness, and facilities, are highly consistent and reliably capture tourists’ perceptions of their accommodations. Since accommodation quality is critical to overall satisfaction and customer experience, this strong reliability is significant for understanding how well accommodations contribute to the tourism experience. Attraction Accessibility also has a CR of 0.821, further confirming that this construct is reliably measured by the items related to ease of access to attractions and the quality of information provided to tourists.

Although there is a weak factor loading for the item on multilingual signage, the overall CR suggests that the construct is still reliable and relevant in the context of this study. The Loyalty construct demonstrates a solid CR value of 0.786, which further supports the validity of the loyalty items included in the survey. Loyalty, often measured through indicators such as the intention to revisit and recommend the destination, is crucial in the tourism sector. For Customer Experience, the CR value needs to check based on how consistent and reliable the items are that measure tourists' overall experience.

The CX items show strong factor loadings (like 0.850 and 0.870 for main items), suggesting that the CX construct probably has a high CR value, showing its validity and reliability. A high CR value for CX would show that the items really capture how tourists feel and experience their visit. Likewise, Tourist Satisfaction shows high CR values linked to questions like "How satisfied are you with your overall experience?" and "Did your experience meet or exceed your expectations?", both with factor loadings of 0.863 and 0.869, respectively. This indicates that Tourist Satisfaction is a reliable construct in this study and provides solid proof that satisfaction is a key and steady measure of overall experience in tourism.

Table 4. Discriminant validity (Source: Own research) Notes: Bold values in diagonal represent the squared root estimate of AVE

Research Constructs	**Mean**	**SD**	**Service Interaction**	**Accommodation Quality**	**Attraction Accessibility**	**Loyalty**	**Tourist Satisfaction**	**Customer Experience**
Service Interaction	3.87	0.90	0.821					
Accommodation Quality	4.22	0.83	0.685***	0.824				
Attraction Accessibility	3.94	1.01	0.675***	0.725***	0.887			
Loyalty	4.01	0.81	0.453***	0.622	0.602***	0.743		
Tourist Satisfaction	3.86	0.93	0.658***	0.659***	0.821	0.678***	0.920	
Customer Experience	4.35	0.94	0.567***	0.725***	0.785***	0.695***	0.752***	0.898

The discriminant validity (Table 4) for the four main study constructs; service interaction, accommodation quality, attraction accessibility, and loyalty are shown in the table below. The squared root estimates of each construct's Average Variance Extracted (AVE), which demonstrate how well each construct explains its own variance in relation to other constructs, are represented by the values on the diagonal. According to Fornell & Larcker (1981), an AVE value greater than 0.5 indicates that a construct is well explained by its indicators and has sufficient convergent validity. The results from the table suggest that all constructs meet this criterion, showing adequate convergent validity. In addition, the discriminant validity is confirmed since the squared root of the AVE for each construct is greater than the correlation with any other construct, supporting the distinctiveness of each factor as proposed by Fornell & Larcker (1981) and Hair et al. (2010).

- The AVE values are all above 0.5, which indicates adequate convergent validity for the constructs.
- Service Interaction has a strong correlation with Accommodation Quality (0.685) and Attraction Accessibility (0.675), suggesting a positive relationship between these constructs in driving customer experience.
- Accommodation Quality and Attraction Accessibility show a high correlation (0.725), confirming that these two factors are closely linked in shaping customer satisfaction.
- Loyalty has moderate correlations with Service Interaction (0.453) and Attraction Accessibility (0.602), with a strong correlation to Accommodation Quality (0.622), indicating that customer satisfaction with accommodations plays a significant role in driving loyalty.

Table 5 provides the model fit indices for the measurement model. The Absolute Fit index, measured by RMSEA (Root Mean Square Error of Approximation), is well within the required threshold of 0.080, achieving a value of 0.051, indicating an excellent fit. The Incremental Fit, represented by CFI (Comparative Fit Index), has a value of 0.921, which is above the recommended threshold of 0.90, confirming a good fit between the proposed model and the data. The Parsimonious Fit, assessed through the Chi-square/degrees of freedom (χ^2/df) ratio, achieved a value of 2.256, which is also below the required threshold of 3, suggesting that the model is not overly complex and remains parsimonious while still fitting the data well. These results indicate that the measurement model is a good fit, meaning strong validity of the constructs.

Table 5. Model fit measurement model (Source: Own research)

Indicates	Required value	Achieved value	Remarks
Absolute Fit	RMSEA ≤ 0.080	0.051	Achieved
Incremental Fit	CFI ≥ 0.90	0.921	Achieved
Parsimonious Fit	Chisq/df ≤ 3	2.256	Achieved

Table 6 presents the results of the sample t-test, including the coefficients, t-values, p-values, and whether the hypotheses are supported. For Service Interaction **(H1)**, the coefficient is 0.086, with a t-value of 0.44 and a p-value of 0.038, which is below the 0.05 threshold, indicating that the relationship between Service Interaction and Customer Experience is statistically significant and supported. Similarly, Accommodation Quality **(H2)** shows a higher coefficient of 0.167, with a t-value of 1.953 and a p-value of 0.006, providing further support for the hypothesis that high-quality accommodations positively impact Customer Experience. These results underscore the importance of factors like comfort, cleanliness, and staff professionalism in shaping tourists' satisfaction and perceptions of their stay. The Attraction Accessibility construct **(H3)** also shows a significant result, with a coefficient of 0.126, a t-value of 1.061, and a p-value of 0.000, indicating strong support for its positive impact on Customer Experience.

Table 6. Sample t-test results (Source: Own research)

Research Hypothesis	**Coefficient (β)**	**T-value**	**P- value**	**Results**
H1	.086	0.44	.038	Supported
H2	.167	1.953	.006	Supported
H3	.126	1.061	.000	Supported
H4	.004	-.0593	.453	Not supported
H5	.135	1.058	.042	Supported

However, Loyalty **(H4)** has a coefficient of 0.004, with a negative t-value of -0.0593 and a p-value of 0.453, which is above the acceptable 0.05 threshold. This indicates that the hypothesis for loyalty is not supported in this study, suggesting that Customer Loyalty, while important, does not have a direct impact on the competitiveness of the tourism destination in this context. The findings imply that factors beyond loyalty, such as the quality of the overall experience, play a more dominant role in determining the competitiveness of the destination. Additionally, Tourist Satisfaction **(H5)** has a coefficient of 0.135, with a t-value of 1.058 and a p-value of 0.042, which is below the 0.05 threshold, supporting the significant role of satisfaction in enhancing both Customer Experience and the destination's competitiveness.

This result emphasizes the critical mediating effect of Tourist Satisfaction, which amplifies the positive impact of a high-quality customer experience on a destination's ability to remain competitive in the global tourism market. As shown in Figure 2, Tourist Satisfaction plays a key role in driving repeat visits and positive recommendations, which ultimately contribute to the sustained growth and success of tourist destinations.

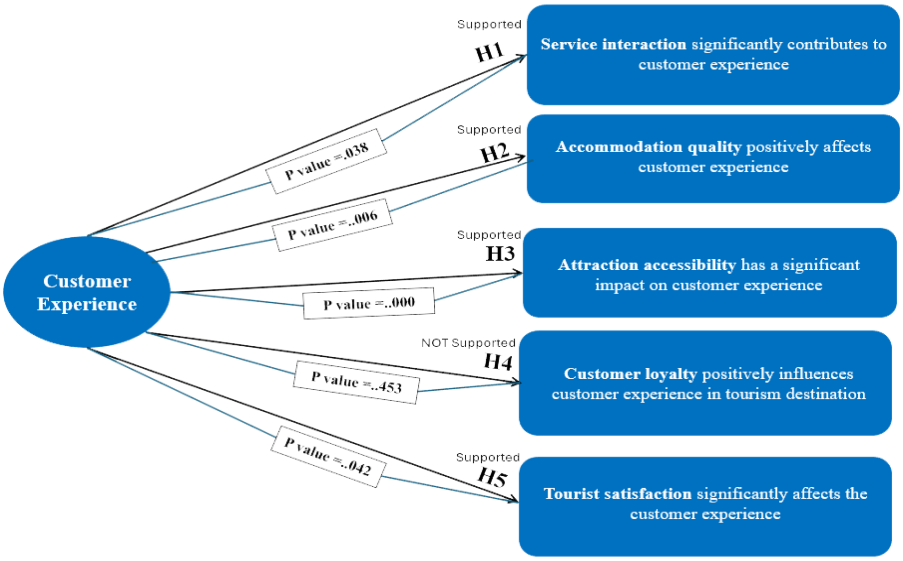


Figure 2. Customer experience determinants model (CEDM) with statistical significance (P values) (Source: Made by authors based on results)

DISCUSSION

After presenting the key findings from the analysis, it is essential to examine how these results align with the hypotheses proposed at the outset of the study. The hypotheses were developed based on the literature review and theoretical framework, aiming to explore the impact of various factors on customer experience and the competitiveness of tourism destinations. To further validate these findings, we will now analyze the results in relation to each hypothesis, assessing the statistical significance and overall support for the proposed relationships between the constructs. This will provide a deeper understanding of how service interaction, accommodation quality, attraction accessibility, and customer loyalty contribute to the competitiveness of tourism destinations.

The following results present an overview of the five hypotheses tested in the study. The hypotheses are designed to examine the impact of key factors on customer experience and destination competitiveness. **H1**, which examines **Service Interaction**, is supported based on the statistical analysis, indicating a significant positive relationship between service interaction and customer experience. **H2**, focusing on **Accommodation Quality**, is also supported, showing that higher accommodation quality improves customer experience and contributes to stronger competitiveness. **H3**, related to **Attraction Accessibility**, is supported as well, confirming that improved access to attractions positively influences customer satisfaction and competitiveness. However, **H4**, regarding **Loyalty**, is not supported. The statistical analysis indicates no significant effect of loyalty on the competitiveness of the destination in this study, suggesting that loyalty alone may not drive long-term growth in this context. **H5**, examining the role of **Tourist Satisfaction**, is supported, as the results demonstrate that higher levels of tourist satisfaction significantly amplify the relationship between customer experience and destination competitiveness, enhancing the destination's overall appeal and competitiveness.

The findings of the study indicate positive perceptions across the four key constructs: Service Interaction, Accommodation Quality, Attraction Accessibility, and Loyalty. Among these, Accommodation Quality emerged as the top-rated factor, with a mean score of 4.30 and a relatively low standard deviation of 0.70. This suggests a high level of satisfaction and consistency in how respondents perceive the quality of accommodations in Essaouira and Marrakech. The positive feedback aligns with the importance of accommodation as a primary determinant of overall satisfaction and experience in tourism. Similarly, Service Interaction and Loyalty received strong positive ratings, with means of 4.10 and 4.15, respectively. These results reflect tourists' favorable interactions with staff and their inclination to revisit and recommend these destinations. The strong correlation between service interaction and loyalty further emphasizes the role of personalized service in fostering customer retention and positive word-of-mouth, which are essential for the long-term competitiveness of tourist destinations. On the other hand, Attraction Accessibility, while still receiving a positive mean score of 4.00, showed greater variability in responses, as indicated by a higher standard deviation of 0.95. This suggests that

while some tourists found attractions easy to access, others encountered challenges, which could hinder their overall experience. The variability in responses likely reflects differing levels of satisfaction with accessibility, including factors such as transportation options, signage, and information availability. Issues like inadequate public transport, unclear signage, or a lack of language-specific materials may have contributed to the discrepancies. This variability in perception underscores the importance of ensuring consistent accessibility to tourist attractions, which is crucial for enhancing overall satisfaction.

The 5th hypothesis states that Tourist Satisfaction influences the Customer Experience–Destination Competitiveness relationship, which further strengthens the positive impact of Customer Experience on Destination Competitiveness with a mean score of 4.20 and a standard deviation of 0.85. The study results provide strong evidence in favour of the hypothesis. The satisfaction of the tourist plays a very important mediating role in enhancing the impact of customer experience and thus competitiveness of the destination. Data shows that high Customer Experience like Service Interaction, Quality of Accommodation, and Access to Attraction can improve Tourist Satisfaction. More satisfied tourists help with the future growth and long-term sustainability of the destination. Moreover, Tourist Satisfaction enhances the competitive positioning of the destination. Further, repeat visitors and advocates are mostly satisfied tourists. The mediation role of Tourist Satisfaction is supported by the data, particularly in the relationships between CX and Destination Competitiveness.

Tourist Satisfaction acts as a key variable that amplifies the positive effects of Customer Experience on the competitive advantage of destinations. When tourists report high satisfaction levels, they are not only more likely to return, but they also serve as valuable promoters for the destination. This is evident from the factor loading of 0.861 for the Loyalty construct, which includes indicators like "Would you recommend this destination to family or friends?" and "Would you revisit this destination?" Both of these items are closely linked to satisfaction, further validating the notion that satisfied tourists are more likely to contribute to the destination's competitiveness through word-of-mouth and repeat visits.

While the results are overall positive, the study identifies several areas that need attention to improve the tourism experience. Attraction Accessibility was rated lower than the other variables, signalling that accessibility remains an area of concern for many tourists. To address this, the Moroccan government should focus on improving infrastructure, particularly around transportation networks and access to key attractions. Moreover, enhancing the signage and providing more multilingual support could improve the overall experience for tourists, especially those who do not speak Arabic or French.

This could also help address the variability in satisfaction with accessibility observed in the study. The study also revealed that tourists typically stay for an average of only three days in popular destinations like Essaouira and Marrakech, limiting their exposure to cultural and leisure activities. To encourage longer stays, the Moroccan government could develop more personalized tourism packages that cater to diverse interests, such as cultural tours, adventure activities, or wellness retreats especially that Essaouira has one of the well-known yet rare in the region treatment using the heated sea water. By offering a variety of experiences, tourists may be encouraged to stay longer and explore different aspects of Moroccan culture and heritage. Furthermore, even if tourists' stays remain short, strategies can be implemented to increase their daily spending by offering exclusive high-end experiences, such as luxury desert tours or spa treatments, which could also benefit local businesses. Additionally, Infrastructure improvements are also essential, particularly for destinations like Essaouira, where the airport currently only handles seven international flights.

This limitation on air travel accessibility could be addressed by upgrading the airport to accommodate more international flights, providing tourists with additional entry points to the destination. Improving air travel infrastructure would not only reduce congestion at Marrakech's airport but also offer greater flexibility for tourists visiting Essaouira. Enhanced access to the region could significantly contribute to its growth as a popular tourism hub.

Lastly, the use of AI-driven digital platforms presents an opportunity to improve visitor engagement and enhance the overall tourism experience. Interactive mobile apps, for instance, could provide real-time information on local attractions, historical sites, and events, making it easier for tourists to navigate the destination and plan their visits. Since many tourists already rely on digital platforms like social media to discover destinations, integrating these technologies into the tourism experience could help align with tourist behavior. The Moroccan government and tourism stakeholders should leverage platforms like Instagram and TikTok to engage with potential visitors, offering them personalized recommendations and promotions that could boost destination visibility and appeal.

CONCLUSION

This study proves the importance of Customer Experience as a tool for increasing the competitiveness of Morocco's tourism in popular cities Essaouira and Marrakech. The findings show that the quality of accommodation has the greatest effect, and the more positive the perception of this factor, the more satisfied the person will be, as well as the more likely they will be to recommend and/or revisit the destination. Moroccan tourism sector competitiveness is also reinforced through Service Interaction and Loyalty. Tourist Satisfaction was a significant mediator of positive Customer Experience effect on destination competitiveness. When tourists are satisfied, they are more likely to return, recommend and engage with the tourist destination for longer. Attraction Accessibility received a favorable rating though the variation in responses indicate that the area has a way to go in terms of accessibility and infrastructure. The results of the study provide stakeholders and policy makers in Morocco with insight into improving tourism packages and infrastructure as well as an avenue through AI-powered platforms designed to engage tourists. By improving areas of concern, including accessibility and infrastructure, and improving Tourist Satisfaction, Morocco can reinforce its position as a tourism mainstay further.

Future research could focus on the impact of AI-driven personalization on customer experience in tourism. Exploring how AI and machine learning can tailor recommendations for accommodations, activities, and attractions based on individual preferences could help destinations better meet customer expectations, enhancing satisfaction and competitiveness.

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