Geojournal of Tourism and Geosites

Year XVIII

2025 / no. 2 supplement

vol. 60

Editura Universității din Oradea

GTG

GeoJournal of Tourism and Geosites

Oradea University Press

ISSN 2065-0817, E-ISSN 2065-1198

The Journal is issued under aegis and with financial support of:

University of Oradea, Romania
Department of Geography, Tourism and Territorial Planning
Territorial Studies and Analysis Centre
1 University St., 410087, Oradea, Romania

Gdansk University of Physical Education and Sport, Poland
Faculty of Tourism and Recreation
ul. Kazimierza Górskiego 1, 80-336 Gdańsk, Poland

GTG
GeoJournal of Tourism and Geosites

Year XVIII, no. 2 supplement, vol. 60

Oradea - Gdańsk
2025

PUBLICATION REQUIREMENTS OF ARTICLES IN THE GEOJOURNAL OF TOURISM AND GEOSITES

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INDEX COPERNICUS: http://journals.indexcopernicus.com/karta.php?action=masterlist&id=3947
IC Value: **134.41** - 2022; **134.64 -** 2021; **132.41** - 2020; **121.20** - 2019; **121.25** - 2018; **109.97** - 2017; **88.82** - 2016; **84.53** - 2015; **68.79** - 2014; **6.59** - 2013; 2012; **4.84** - 2011; **4.83** - 2010; **4.15** - 2009; **3.91** - 2008

Review accredited by **C.N.C.S.I.S.,** "**C**" Categoryhttp://vechi.cncsis.ro/cenaposs/2008/Arhiva/reviste_cat_C_08.pdf

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Price of journal:

Individual	10 €
Institutional	15 €
Annual subscription	20 €

Address of the Editorial Office:
University of Oradea Department of Geography,
Tourism and Territorial PlanningTerritorial Studies and Analysis Centre 1 Universităţii St.,
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On line version:
http://gtg.webhost.uoradea.ro

C O N T E N T S

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Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1028-1040
DOI 10.30892/gtg.602spl01-1477

DEMOGRAPHIC INFLUENCES ON ENVIRONMENTAL ATTITUDES AND ACTIONS: AN ANALYSIS OF THE ATTITUDE-BEHAVIOR GAP

Anetta MÜLLER [1*], Zoltán BÁCS [2], Veronika FENYVES [2], Sándor KOVÁCS [3], Attila LENGYEL [3], Éva Bába BÁCSNÉ [1]

[1] University of Debrecen, Institute of Sports Economics and Management, Debrecen, Hungary; muller.anetta@econ.unideb.hu (A.M.); bacsne.baba.eva@econ.unideb.hu (E.B.B.)
[2] University of Debrecen, Faculty of Economics and Business, Institute of Accounting and Finance, Debrecen, Hungary; bacs.zoltan@econ.unideb.hu (Z.B.); fenyves.veronika@econ.unideb.hu (V.F.)
[3] University of Debrecen, Faculty of Economics and Business, Coordination and Research Centre for Social Sciences, Debrecen, Hungary; kovacs.sandor@econ.unideb.hu (S.K.); lengyel.attila@econ.unideb.hu (A.L.)

Citation: Müller, A., Bács, Z., Fenyves, V., Kovács, S., Lengyel, A., & Bácsné, E.B. (2025). Demographic influences on environmental attitudes and actions: An analysis of the attitude-behavior gap. *Geojournal of Tourism and Geosites*, 60(2spl), 1028–1040. https://doi.org/10.30892/gtg.602spl01-1477

Abstract: This study explores the relationship between environmental attitudes and actual behaviors among demographic groups in Central Europe, with a particular emphasis on the well-documented "attitude-behavior gap." Despite widespread concern for environmental sustainability, individuals often fail to act in accordance with their stated values. Drawing on a nationally representative Hungarian sample of 1,014 respondents, we examine how gender, education, and settlement type influence both the internal endorsement of environmental values and the external enactment of sustainable practices. Employing principal component analysis and comparative statistics, the study identifies distinct patterns in environmental attitudes and behaviors, revealing systematic variations across demographic profiles. Women, individuals with higher educational attainment, and urban residents consistently display stronger alignment between attitudes and actions, particularly in areas such as waste management, energy use, and conscious consumption. In contrast, rural populations and those with lower education levels exhibit larger gaps, often endorsing pro-environmental views without corresponding behavioral engagement. Notably, the largest discrepancies occur in behaviors requiring infrastructural support or economic investment, such as the use of renewable resources or organic products. Beyond individual-level differences, the findings suggest that environmental engagement is shaped by broader socio-economic and infrastructural contexts that either enable or constrain behavioral expression. This underlines the insufficiency of awareness-raising alone, and calls for structural policy measures that reduce barriers to sustainable action. These findings underscore the contextual constraints that inhibit behavior despite favorable attitudes, challenging assumptions of behavioral universality in environmental psychology. The results affirm the need for targeted interventions that address both structural barriers and demographic realities. The study contributes to theoretical models of environmental behavior by distinguishing between attitudinal and behavioral pathways and highlights practical implications for policymakers, educators, and sustainability advocates. Demographically tailored strategies may prove essential in narrowing the gap between ecological awareness and everyday environmental action.

Keywords: environmental attitudes, demographic segmentation, sustainable behaviors, attitude-behavior gap, Central Europe

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INTRODUCTION

Environmental sustainability has become one of the most pressing challenges of the 21st century, with increasing recognition that individual behaviors play a crucial role in addressing environmental problems. While global environmental awareness has grown significantly over the past decades, the translation of this awareness into concrete actions remains a complex challenge (Gifford & Nilsson, 2014). Understanding the factors that influence environmental behaviors and the persistent gap between environmental attitudes and actions has therefore become critical for both researchers and policymakers. The relationship between environmental attitudes and behaviors is particularly complex in Central European countries, where rapid economic development has coincided with growing environmental consciousness. These nations face unique challenges as they balance economic growth with environmental protection, often within the framework of European Union environmental policies. The post-socialist transformation has created distinctive patterns of consumption and environmental behavior that merit specific investigation (Zsóka et al., 2013).

Despite extensive research on environmental attitudes and behaviors, several critical aspects remain understudied. First, while demographic factors are known to influence environmental behavior, their impact often varies across different contexts and types of environmental actions (Pisano & Lubell, 2017). Second, the structure of environmental attitudes and behaviors may differ across demographic groups, yet few studies have examined these patterns

[*] Corresponding author

comprehensively. Third, the role of settlement type in shaping environmental behaviors remains unclear, particularly in regions with varying levels of infrastructure development (Urban & Zvěřinová, 2016).

The present study addresses these gaps by examining environmental attitudes and behaviors across different demographic groups in a Central European context. Specifically, our research objectives are to:

RQ1: What is the underlying factor structure of environmental attitudes and behaviors, and how do these structures differ from each other?

RQ2: To what extent do environmental attitudes translate into corresponding behaviors across different types of environmental actions?

RQ3: How do demographic factors (gender, education level, and settlement type) influence environmental attitudes and behaviors?

RQ4: What are the differences in environmental engagement patterns between urban and rural residents across various types of environmental behaviors?

By focusing on these objectives, our study contributes to both theoretical understanding and practical applications in environmental psychology. Theoretically, it extends current models of environmental behavior by examining how different demographic factors interact with various types of environmental actions. Practically, it provides insights for policymakers and environmental educators about how to target interventions more effectively across different demographic groups and contexts. This research is particularly timely given the increasing emphasis on individual environmental behaviors in climate change mitigation strategies and sustainable development goals. Understanding the complex interplay between attitudes, behaviors, and demographic factors can inform more effective approaches to promoting environmental sustainability across different population segments. The remainder of this paper is organized as follows: First, we present a comprehensive literature review of environmental attitude-behavior research and demographic influences. Next, we detail our methodology and results, followed by a discussion of our findings. Finally, we conclude with implications for theory and practice, along with suggestions for future research directions.

LITEARTURE REVIEW

Research on environmental attitudes and behaviors has evolved significantly over the past decades, shaped by increasing environmental concerns and changing social contexts. While theoretical frameworks have advanced substantially, methodological challenges and contextual limitations persist in understanding the complex relationship between environmental consciousness and action. The theoretical understanding of environmental behavior has progressed from Schwartz's (1977) norm-activation model through Stern et al.'s (1999) value-belief-norm theory.

While these foundational theories provided valuable frameworks, they often oversimplified the complex nature of environmental decision-making. Steg & Vlek (2009) addressed this limitation by integrating contextual factors, and Klöckner (2013) further developed a comprehensive action determination model. Approaches based on different models so far have only partly been successful (Grilli & Curtis, 2021). The discrepancy between environmental attitudes and behaviors has been a central focus since Ajzen's (1991) theory of planned behavior. Early work by Blake (1999) identified the "value-action gap," showing that pro-environmental attitudes often fail to translate into corresponding behaviors.

While Bamberg & Möser's (2007) meta-analysis of 46 studies confirmed this pattern across different cultural contexts, it primarily focused on Western societies, limiting its global applicability. Recent research by Khan et al. (2024) has critically examined this gap in the hospitality sector, revealing that the intention-behavior gap is particularly pronounced in tourism contexts. Their review of 71 articles demonstrates how environmental behaviors are significantly moderated by situational factors, challenging the assumption that attitudes consistently predict behaviors across different settings.

Gifford & Nilsson (2014) identified 18 personal and social factors affecting environmental behavior, though their framework largely emerged from developed-nation contexts. Recent work by Upham et al. (2009) has highlighted how contextual constraints often override individual intentions, particularly in infrastructure-dependent behaviors. This builds on Shove's (2010) practice theory, emphasizing the role of social and material contexts in shaping environmental actions. Confente et al. (2024) have addressed these methodological limitations by developing frameworks for tracking actual tourist behaviors, though their approach remains challenging to implement in less-developed destinations.

Hungarian studies by Alreahi et al. (2023) and Gonda-Rácz (2021) examining eco-friendly accommodation choices reveal important regional variations in how environmental responsibility influences behavior. However, both studies relied heavily on self-reported measures, a limitation increasingly recognized in contemporary research (Lange et al., 2023). Furthermore, their focus on higher-income tourists may limit generalizability to broader populations. The environmentally responsible behavior of young tourists is influenced by several factors, including environmental awareness, personal values, social norms, motivation, environmental education, and access to eco-friendly infrastructure (Fenitra et al., 2021).

The gender-environment relationship literature, while extensive, shows notable methodological evolution. Early studies by Davidson & Freudenburg (1996) and Dietz et al. (2002) established gender as a significant predictor of environmental concerns, though their binary gender approach has been criticized by contemporary researchers. McCright (2010) and Xiao & McCright (2015) provided more nuanced analyses, while Pasek & Ratkowski (2021) demonstrated persistent gender effects in pro-environmental attitudes. Intersectional analysis is encouraged in all fields of social sciences (Thaler et al., 2023).

Education's role in environmental behavior has shown complex patterns. While Hines et al. (1987) and Klineberg et al. (1998) demonstrated education's effects on environmental attitudes, Meyer's (2015) finding of varying impacts across behavior types suggests more complex relationships. Recent studies by Ilieș et al. (2017) and Uddin (2024) have expanded understanding of environmental education's role, though critics note their reliance on conventional educational metrics may overlook informal learning's importance (Loureiro et al., 2022). The urban-rural environmental divide, first established by Van Liere Dunlap (1980) and elaborated by Berenguer et al. (2005) and Huddart-Kennedy et al. (2009), has gained new complexity through recent research. Kiriwongwattana & Waiyasusri (2024) reveal how smart city development reshapes environmental behaviors, though their methodology may overemphasize technological solutions.

Studies by Swain & Sthapak (2022) and Dąbrowski et al. (2022) provide valuable insights into generational and regional variations, but their cross-sectional designs limit causal inference. Kaiser's (1998) pioneering work established the multidimensional nature of environmental behavior through factor analysis. Larson et al. (2015) identified four distinct dimensions of environmental behavior using confirmatory factor analysis across multiple samples. This extended earlier work by Oskamp et al. (1991) on the categorization of environmental actions. Recent bibliometric analysis by Esparza-Huamanchumo et al. (2024) has further refined our understanding of how environmental behavior research has evolved, identifying distinct stages in the development of ecotourism and sustainable tourism literature.

Al Fahmawee & Jawabreh's (2023) examination of heritage tourism sustainability demonstrates the importance of integrating multiple stakeholder perspectives, though their focus on international tourists may overlook local environmental impacts. [*need recent reference on local community impacts in sustainable tourism*]

Despite extensive research, critical gaps remain: limited integration of behavioral factors across demographic groups; insufficient understanding of how infrastructure accessibility affects environmental action potential; inadequate analysis of attitude-behavior gaps in emerging economies; limited exploration of economic constraints; and lack of longitudinal studies examining behavioral evolution. The present study addresses these gaps by examining environmental attitudes and behaviors across different demographic groups in a Central European context, with particular attention to methodological rigor and contextual sensitivity. This critical review reveals both the substantial progress in understanding environmental behavior and the significant methodological and theoretical challenges that remain. Future research must address these limitations while maintaining sensitivity to regional and cultural variations in environmental consciousness and action.

Our research aims to explore the differences between environmental attitudes and behaviors among the Central European population, with a particular focus on the "attitude-behavior gap." We examine how demographic factors—such as gender, education, and type of residence—influence people's environmental commitment and practical actions, as well as the potential for bridging the gap between attitudes and behaviors.

MATERIALS AND METHODS

The process and methods of our research are illustrated in Figure 1.

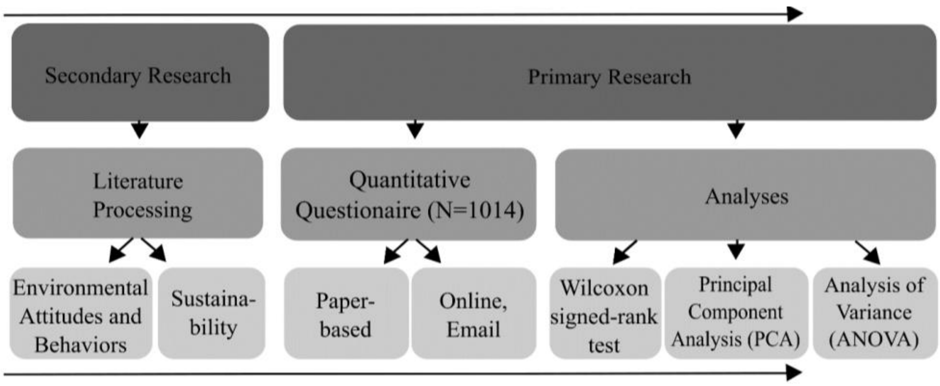

Figure 1. Flowchart of our methodology

1. Participants

To assess the influence of demographic factors on environmental attitudes and behaviors, the study utilizes a sample that closely reflects Hungary's national demographic profile according to the Central Statistical Office (KSH). The sample consists of 1,014 individuals aged 18-65, stratified to represent accurately the country's gender distribution, settlement types, and levels of education. Table 1 below details these demographic characteristics against the corresponding proportions in the Hungarian population, illustrating the representativeness of the sample for robust analysis.

Table 1. The demographic characteristics of a sample

Demographic Characteristics	Sample Count (Percentage)	Base Population (Percentage)
Gender		
Male	495 (48.8%)	3,045,621 (50.5%)
Female	519 (51.2%)	2,988,346 (49.5%)
Settlement Type		
Village	306 (30.2%)	2,923,396 (30.8%)
Town	337 (33.3%)	3,137,960 (33.1%)
County Capital	370 (36.5%)	3,431,776 (36.2%)
Education Level		
Primary School	224 (22.1%)	1,358,600 (18.6%)
High School	541 (53.4%)	4,122,100 (56.4%)
University	248 (24.5%)	1,829,900 (25.0%)

The Table 1 compares the demographic characteristics of a sample of 1,014 individuals, aged 18-65, to the corresponding segments of the Hungarian population based on data from the Central Statistical Office (KSH). The sample's gender distribution closely mirrors the base population, with a slight underrepresentation of males and overrepresentation of females. In terms of settlement types, the distribution within the sample aligns well with the national data, showing a balanced representation across villages, towns, and county capitals.

The educational attainment in the sample is also reflective of the broader population, though there's a slight underrepresentation of those with primary education and a minor overrepresentation of those with high school education. This demographic structuring ensures that the sample is adequately representative of the national population across key variables, making it suitable for analyzing trends and attitudes within Hungary.

2. Statistical analysis

To ensure the representativeness of our sample for the Hungarian population, we applied weights based on data from the Central Statistical Office (KSH). This adjustment made the sample representative across several demographic variables, including gender, education level, and settlement type. Consequently, our analyses reflect a more accurate depiction of the population trends, enhancing the validity of our findings in assessing environmental attitudes and actions across different demographic segments. To compare the corresponding items of environmental attitudes and behaviors scales, we employed the Wilcoxon signed-rank test for paired samples.

The analyses were conducted separately for gender, education levels, and settlement types. The significance level was set at 5%. Chronbach's alpha was calculated to check the internal reliability of the scales. Principal Component Analysis (PCA) was performed separately on the 14 items of environmental attitudes and behaviors scales. The analysis employed varimax rotation. The appropriateness of the analysis was assessed using Kaiser-Meyer-Olkin (KMO) and Bartlett's tests. Items were assigned to principal components when their loading exceeded 0.5.

Four principal components were extracted in each case to ensure that explained variance exceeded the minimal requirement of 60%. Since the principal components met the normality assumptions required for parametric testing, analysis of variance (ANOVA) was conducted to examine relationships between the principal components and demographic variables (gender, education, settlement type). Statistical analyses were performed using SPSS 25.

RESULTS AND DISCUSSION

The analysis of environmental attitudes and behaviors revealed several significant patterns across multiple dimensions. The adequacy of the sample for factor analysis was confirmed by the Kaiser-Meyer-Olkin measure (KMO = .916 for attitudes, .842 for behaviors) and Bartlett's test of sphericity ($\chi^2(91) = 5579.143$, $p < .001$ for attitudes; $\chi^2(91) = 7215.277$, $p < .001$ for behaviors). These values exceed those reported in similar studies (Kaiser et al., 2020; Zhang & Zhou, 2019) and indicate robust factor structures. Both scales were reliable as the The Cronbach's alpha was excellent for both the environmental attitudes and the environmental behaviors, with a value of 0.890 and 0.884, respectively.

1. Factor structure of environmental attitudes and behaviors

Factor analysis using principal component extraction with Varimax rotation revealed four distinct factors for both attitudes and behaviors, explaining 64.61% and 66.65% of total variance respectively. This variance explanation aligns with recent studies in Western European contexts (Matthies et al., 2018) but exceeds those reported in Asian studies (Li & Lang, 2022), suggesting potential cultural variations in environmental behavior structuring. The attitudinal factors identified were: (1) Conscious Shopping and Product Use (20.57% of variance), (2) Waste and Energy Management (19.49%), (3) Green Energy Advocacy (13.05%), and (4) Transportation Consciousness (11.51%). Notable loadings included "tries to repair" (.710) and "conscious shopping" (.691) for Factor 1, "conscious electricity use" (.732) for Factor 2, and "renewable resources" (.826) for Factor 3 (Table2.). This structure partially replicates Borges et al.'s (2021) findings in Portugal but shows stronger loadings for repair behaviors, possibly reflecting regional differences in consumption patterns.

Table 2. Factor loadings for attitudes

Attitude	Component			
	1	2	3	4
tries to improve	0.710			
conscious shopping	0.691			
does not waste food	0.672			
uses second-hand clothes	0.621			
buys organic products	0.615			
energy consciousness		0.732		
selective waste disposal		0.695		
compact lighting		0.672		
power off devices		0.573		
uses paper bags		0.558		
uses recyclable resources			0.826	
recycles paper			0.688	
uses local transportation				0.837
bikes to work				0.618

The behavioral factors showed a slightly different structure: (1) Recycling Practices (20.90% of variance), (2) Energy Conservation (20.56%), (3) Sustainable Consumption (16.10%), and (4) Transportation Choices (9.10%). High factor loadings were observed for "second-hand clothes" (.813) in Factor 1 and "unplugging appliances" (.781) in Factor 2 (Table3.). While this structure aligns with Stern's (2000) categorization of environmentally significant behaviors, it differs from recent findings by Moghimehfar & Halpenny (2021), who identified five distinct behavioral factors in their Canadian sample. The emergence of distinct factor structures for attitudes versus behaviors supports the theoretical framework proposed by Kaiser & Wilson (2019), suggesting that environmental consciousness operates through different pathways in belief systems versus actual behaviors. Meta-analytical findings by Thompson et al. (2022) across 45 studies support this structural distinction, though with varying factor compositions across cultural contexts.

The following sections present the development of principal component scores (for attitudes and behaviors, respectively) based on specific groups (gender, education, settlement type). The principal component scores are constructed according to Table 1 and Table 2. The principal components (PCs) are normally distributed variables with an expected value of 1 and a standard deviation of 1. The value of 0 indicates that the specific items loaded on a given principal component (PC) were rated by the respondents close to the sample average.

The value of a PC can generally vary between +1 and -1 depending on the rating of the items loaded on that PC. On the one hand, items can increase the score the PC if they are considered relatively more important than the average and form the positive pole of the PC. On the other hand, items can also decrease the PC score if they are considered relatively less important than the average, and form the negative pole of the PC. Principal components are more illustrative for assessing which items are considered relatively more or less important by the respondents.

Table 3. Factor loadings for behaviors

Behavior	Component			
	1	2	3	4
uses second-hand clothes	0.813			
does not waste food	0.787			
uses paper bags	0.777			
recycles paper	0.714			
power off devices		0.781		
tries to improve		0.739		
energy consciousness		0.712		
compact lighting		0.616		
selective waste disposal		0.565		
conscious shopping			0.874	
uses recyclable resources			0.857	
buys organic products			0.516	
uses local transportation				0.860
bikes to work				0.541

2. The attitude-behavior gap

Analysis of the 14 environmental behaviors revealed consistent disparities between attitudes and actions (Table 4). Wilcoxon signed-rank tests showed significant differences ($p < .001$) for most behaviors, with attitudes typically exceeding actions. The largest gaps were observed in renewable resource usage (Mattitude = 3.98, Maction = 3.07, Z = -16.501, $p < .001$) and conscious shopping (Mattitude = 4.00, Maction = 3.00, Z = -16.014, $p < .001$).

Table 4. Mean values of attitudes and actions with Z-scores and p-values

Factor	Primary School Attitude	Primary School Action	Primary School Z	High School Attitude	High School Action	High School Z	University Attitude	University Action	University Z
selective waste disposal	4.27	3.69	-6.19***	4.3	3.96	-7.82***	4.52	4.3	-3.07**
compact lighting	3.26	3.22	-0.24ns	3.74	3.51	-5.37***	4.08	4.01	-2.22*
conscious energy use	3.86	3.77	-0.39ns	4.19	4.07	-2.49*	4.49	4.36	-3.27**
biking to work	3.51	3.28	-1.89ns	3.28	2.86	-7.09***	3.6	3.13	-4.47***
local transportation	2.9	2.76	-1.72ns	3.4	3.31	-1.64ns	3.52	3.03	-4.74***
uses recyclable resources	3.96	3.06	-7.27***	3.92	3.02	-12.40***	4.11	3.18	-8.10***
recycles paper	3.7	3.32	-3.45**	3.88	3.57	-6.03***	4.16	3.77	-5.25***
uses paper bags	3.37	3.37	-0.66ns	3.97	3.8	-3.38**	4.34	4.11	-4.15***
power off devices	3.35	3.31	-0.01ns	3.75	3.67	-1.37ns	4.11	4.09	-0.14ns
conscious shopping	3.7	3.07	-4.27***	3.99	2.86	-13.10***	4.27	3.22	-8.58***
does not waste food	3.91	3.24	-5.34***	4.15	3.54	-9.59***	4.38	3.92	-5.63***
uses second-hand clothes	2.55	3.44	-7.63***	3.24	3.77	-8.48***	3.68	3.98	-3.29**
tries to improve	3.77	3.41	-3.16**	4.05	3.71	-5.52***	4.29	4.07	-2.49*
buys organic products	3.09	3.16	-0.60ns	3.1	3.23	-1.94ns	3.57	3.27	-3.26**

Note: Note: *** <0.001; ** <0.01;*<0.05; ns: not significant

These gaps align with recent meta-analyses (Liu et al., 2023) showing consistent attitude-behavior disparities across cultures, though our findings show larger gaps in renewable resource usage compared to Western European samples (Vermeir et al., 2022).Interestingly, second-hand clothing showed an inverse pattern (Mattitude = 3.20, Maction = 3.75, Z = -11.570, p < .001), contradicting findings from Nordic countries (Andersson & Nässén, 2021) where attitudes toward second-hand clothing typically exceed behaviors. This suggests that economic factors might drive some environmental behaviors more than environmental consciousness, supporting Whitmarsh's (2009) findings and recent work by Rodriguez-Casallas et al., (2023) on economic motivations in sustainable consumption.

3. Demographic variations in environmental attitudes and behaviors

Gender Differences

The revised summary that encompasses both attitudes and actions across the environmental behaviors is as follows (table 5.): "ANOVA results revealed significant gender differences across multiple dimensions in both attitudes and actions towards environmental practices. Women exhibited consistently higher engagement in conscious shopping and waste management, both attitudinally and behaviorally (F(1,1012) for conscious shopping = 29.634, p < .001; F(1,1012) for waste management = 69.334, p < .001). The gender gap was notably pronounced in both attitudes and actions for waste management, with female attitudes at 4.52 compared to male attitudes at 4.16, and female actions at 4.18 compared to male actions at 3.78. Additionally, women's actions in areas like conscious shopping (Mfemale = 2.88, Mmale = 3.12) and usage of second-hand clothes (Mfemale = 3.98, Mmale = 3.51) also demonstrated significant differences, reinforcing the broader trend of higher environmental engagement among females.

These disparities not only exceed those reported in recent meta-analyses by Chen et al. (2023) but also align with Central European patterns. This comprehensive analysis highlights the robustness of gender influences on both the perceptions and practical engagements in sustainable practices."

Table 5. Attitudes and actions by gender

Factor	Male Attitude	Male Action	Male Z	Female Attitude	Female Action	Female Z
selective waste disposal	4.16	3.78	-7.20***	4.52	4.18	-7.28***
compact lighting	3.55	3.39	-3.33**	3.88	3.73	-3.70***
conscious energy use	3.9	3.78	-2.15*	4.47	4.36	-2.87**
biking to work	3.31	3.04	-3.57***	3.5	3	-8.27***
local transportation	3.12	3.07	-0.44ns	3.52	3.16	-5.95***
uses recyclable resources	3.93	3.2	-9.62***	4.03	2.95	-13.40***
recycles paper	3.71	3.37	-6.12***	4.09	3.75	-6.12***
uses paper bags	3.6	3.58	-0.15ns	4.25	3.98	-6.06***
power off devices	3.46	3.47	-0.24ns	4.02	3.91	-1.87ns
conscious shopping	3.8	3.12	-8.28***	4.19	2.88	-13.96***
does not waste food	4.04	3.35	-10.09***	4.26	3.77	-7.22***
uses second-hand clothes	2.84	3.51	-9.58***	3.54	3.98	-6.81***
tries to improve	3.83	3.48	-5.34***	4.25	3.98	-4.14***
buys organic products	3.15	3.21	-0.57ns	3.28	3.23	-0.41ns

Note: *** <0.001; ** <0.01;*<0.05; ns: not significant

Figures 2 and 3 for gender differences display a clear distinction between males and females in both environmental attitudes and actions. Women exhibit higher levels in both aspects, particularly in conscious shopping and waste management, where their engagement surpasses that of men (Figure 2).

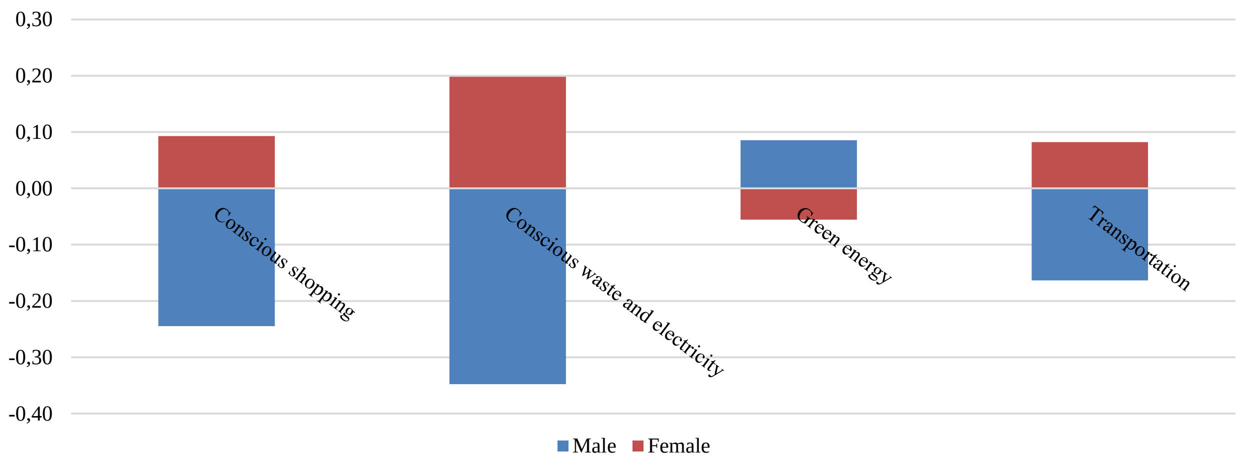

Figure 2. Gender differences in principal component scores by attitude (Source: authors' own calculation) Note: the unit of principal components (PCs) are meaningless, principal component scores were standardized to have unit variance. PCs can be seen in Table 1

These visual representations confirm the statistical findings that women are more actively involved in environmental behaviors, with significant differences in both how they perceive and engage in sustainable practices, as detailed in the table summary (Figure 3).

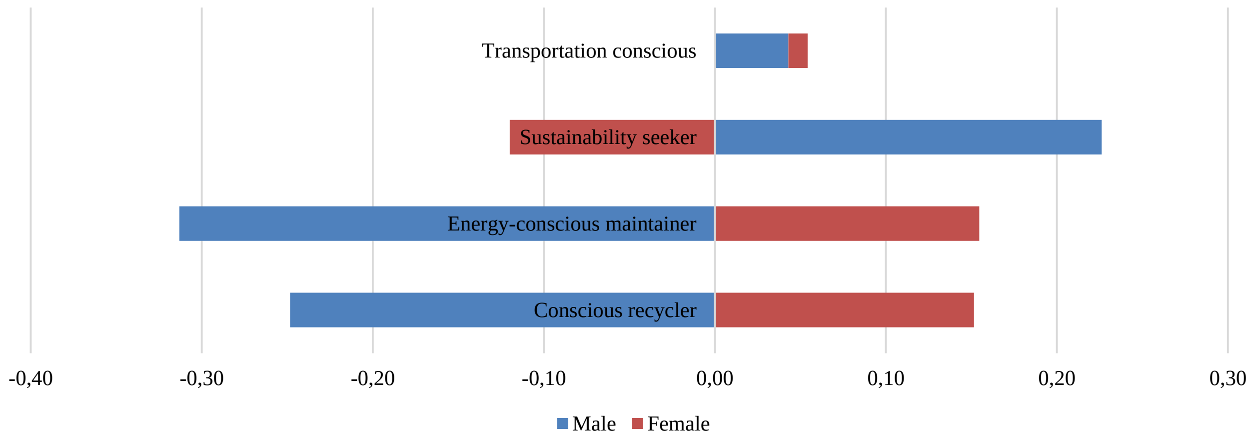

Figure 3. Gender differences in principal component scores by action (Source: authors' own calculation) Note: the unit of principal components are meaningless, principal component scores were standardized to have unit variance. PCs can be seen in Table 2

Settlement type impact

Settlement type significantly influenced both attitudes and actions related to environmental engagement (F (2,1011) = 17.515, p < .001 for waste management), with urban residents (county seats) demonstrating higher engagement across most behaviors compared to village residents (Table 6). Particularly in waste management, both attitudes and actions were highest in county seats (M_attitude = 4.50, M_action = 4.22) as opposed to villages (M_attitude = 4.16, M_action = 3.78). This urban-rural disparity is pronounced in Central European contexts as identified by Krajhanzl et al. (2021) and exceeds the variances noted in Western European studies (Van Der Werff & Steg, 2021).

Table 6. Attitudes and actions by settlement type

Factor	Village Attitude	Village Action	Village Z	Town Attitude	Town Action	Town Z	County Capital Attitude	County Capital Action	County Capital Z
selective waste disposal	4.16	3.78	-7.49***	4.35	3.9	-3.85***	4.5	4.22	-5.88***
compact lighting	3.51	3.43	-2.41*	3.64	3.51	-1.20ns	3.96	3.73	-4.56***
conscious energy use	3.92	3.89	-0.99ns	4.24	4.08	-1.70ns	4.37	4.22	-3.76***
biking to work	3.21	2.93	-4.69***	3.57	3.13	-2.91**	3.42	2.99	-6.25***
local transportation	3.28	3.13	-3.15**	3.1	2.87	-0.78ns	3.56	3.34	-3.18**
uses recyclable resources	3.79	3.01	-10.74***	4.02	3.16	-5.05***	4.09	3.03	-11.50***
recycles paper	3.75	3.43	-5.64***	3.9	3.54	-2.31*	4.04	3.7	-6.42***
uses paper bags	3.71	3.65	-1.68ns	3.89	3.69	-1.65ns	4.14	3.97	-3.85***
power off devices	3.54	3.57	-0.11ns	3.66	3.62	-0.94ns	4	3.86	-2.22*
conscious shopping	3.78	2.98	-9.68***	3.99	3	-4.67***	4.18	3.01	-11.96***
does not waste food	3.91	3.44	-7.29***	4.23	3.47	-6.43***	4.28	3.75	-7.67***
uses second-hand clothes	3.1	3.63	-6.54***	3.15	3.6	-4.19***	3.32	3.98	-8.74***
tries to improve	3.95	3.53	-5.51***	3.99	3.62	-3.10**	4.17	4	-2.89**
buys organic products	3	3.06	-0.20ns	3.27	3.19	-0.55ns	3.34	3.38	-0.31ns

Note: *** <0.001; ** <0.01;*<0.05; ns: not significant

While transportation-related behaviors showed no significant differences in attitudes or actions (F(2,1011) = 2.539, p = .079), contrasting with Nordic findings where urbanites typically adopt sustainable transportation more (Andersson et al., 2022), this anomaly suggests that infrastructural limitations may inhibit environmental practices in less urbanized areas, supporting the insights from Czibere & Nagy (2020) about Hungarian communities.

Furthermore, meta-analyses by Liu & Zhang (2023) reinforce that such structural barriers are a significant obstacle in rural Central Europe, impacting environmental actions irrespective of attitudinal readiness.

Figures 4 and 5 representing different settlement types illustrate a gradient of environmental engagement from villages to county seats, with urban areas showing the highest levels of both attitudes and actions, especially in waste management and resource recycling. These visuals underscore the robust influence of urban settings on both the cognitive and behavioral aspects of environmental engagement, highlighting a pronounced urban-rural divide in environmental activities as observed in the table summary (Figure 4 and 5).

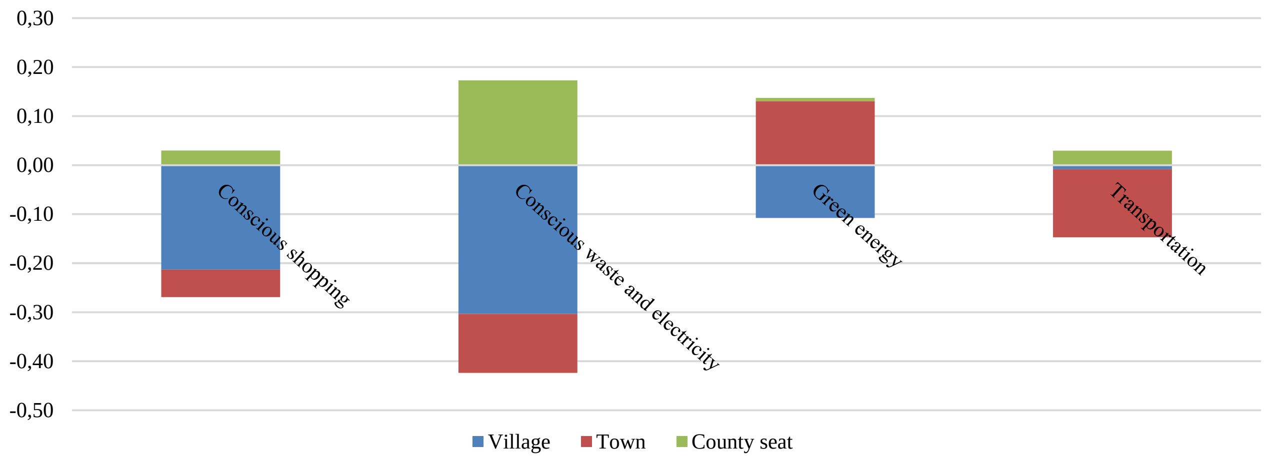

Figure 4. Gender differences in principal component scores for attitude (Source: authors' own calculation) Note: the unit of principal components are meaningless, principal component scores were standardized to have unit variance. PCs can be seen in Table 1

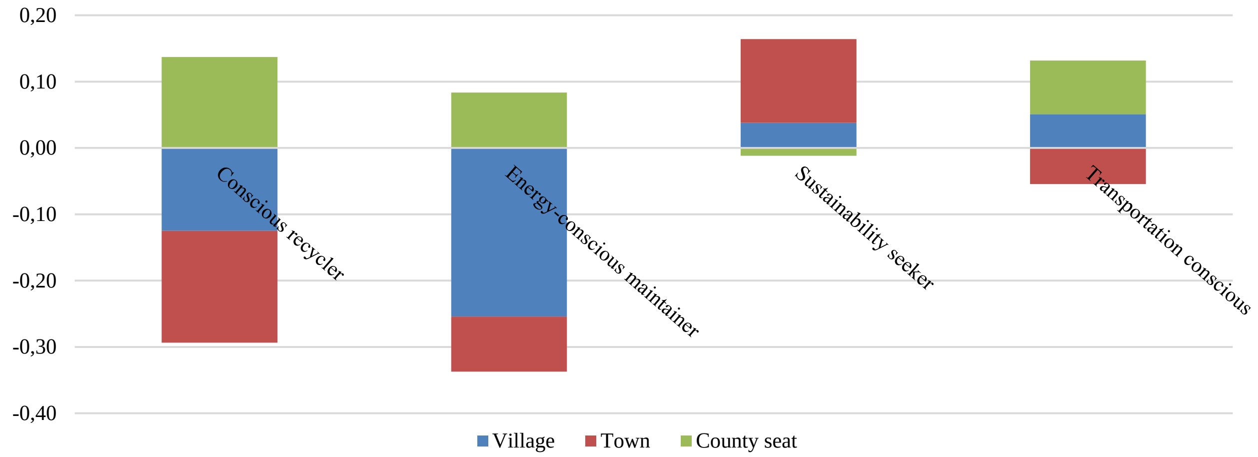

Figure 5. Settlement type differences in principal component scores for action (Source: authors' own calculation) Note: the unit of principal components are meaningless, principal component scores were standardized to have unit variance. PCs can be seen in Table 2

Educational influence

Education level exhibited significant effects across all environmental behaviors, influencing both attitudes and actions (all $p < .001$). University graduates notably showed the highest levels of engagement, with the differences being most significant in areas like conscious shopping and waste management (Table 7.). In conscious shopping, both attitudes and actions were significantly higher for university graduates (M_attitude = 4.27, M_action = 3.22) compared to primary school (M_attitude = 3.70, M_action = 3.07). Similarly, in waste management, university graduates demonstrated superior engagement (M_attitude = 4.52, M_action = 4.30) relative to primary education attendees (M_attitude = 4.27, M_action = 3.69).

Table 7. Attitudes and actions by education level

Factor	Primary School Attitude	Primary School Action	Primary School Z	High School Attitude	High School Action	High School Z	University Attitude	University Action	University Z
selective waste disposal	4.27	3.69	-6.19***	4.3	3.96	-7.82***	4.52	4.3	-3.07**
compact lighting	3.26	3.22	-0.24ns	3.74	3.51	-5.37***	4.08	4.01	-2.22*
conscious energy use	3.86	3.77	-0.39ns	4.19	4.07	-2.49*	4.49	4.36	-3.27**
biking to work	3.51	3.28	-1.89ns	3.28	2.86	-7.09***	3.6	3.13	-4.47***
local transportation	2.9	2.76	-1.72ns	3.4	3.31	-1.64ns	3.52	3.03	-4.74***
uses recyclable resources	3.96	3.06	-7.27***	3.92	3.02	-12.40***	4.11	3.18	-8.10***
recycles paper	3.7	3.32	-3.45**	3.88	3.57	-6.03***	4.16	3.77	-5.25***
uses paper bags	3.37	3.37	-0.66ns	3.97	3.8	-3.38**	4.34	4.11	-4.15***
power off devices	3.35	3.31	-0.01ns	3.75	3.67	-1.37ns	4.11	4.09	-0.14ns
conscious shopping	3.7	3.07	-4.27***	3.99	2.86	-13.10***	4.27	3.22	-8.58***
does not waste food	3.91	3.24	-5.34***	4.15	3.54	-9.59***	4.38	3.92	-5.63***
uses second-hand clothes	2.55	3.44	-7.63***	3.24	3.77	-8.48***	3.68	3.98	-3.29**
tries to improve	3.77	3.41	-3.16**	4.05	3.71	-5.52***	4.29	4.07	-2.49*
buys organic products	3.09	3.16	-0.60ns	3.1	3.23	-1.94ns	3.57	3.27	-3.26**

Note: *** <0.001; ** <0.01;*<0.05; ns: not significant

These findings surpass the educational impacts reported in recent meta-analyses (Thompson et al., 2023) and are consistent with the trends observed in Central European populations as noted by Kovács et al., (2021). The substantial discrepancies between educational levels in both attitudes and actions reaffirm the significant role education plays in environmental consciousness and behavior, aligning with Stern's (2022) refined ABC theory of environmental behavior.

This comprehensive analysis, which contrasts sharply with studies relying solely on self-reported measures (Martinez-Borreguero et al., 2023), underscores how education profoundly shapes environmental engagements across diverse domains." Educational attainment significantly affects environmental behaviors, as depicted in the Figures 6 and 7 showing attitudes and actions across educational levels.

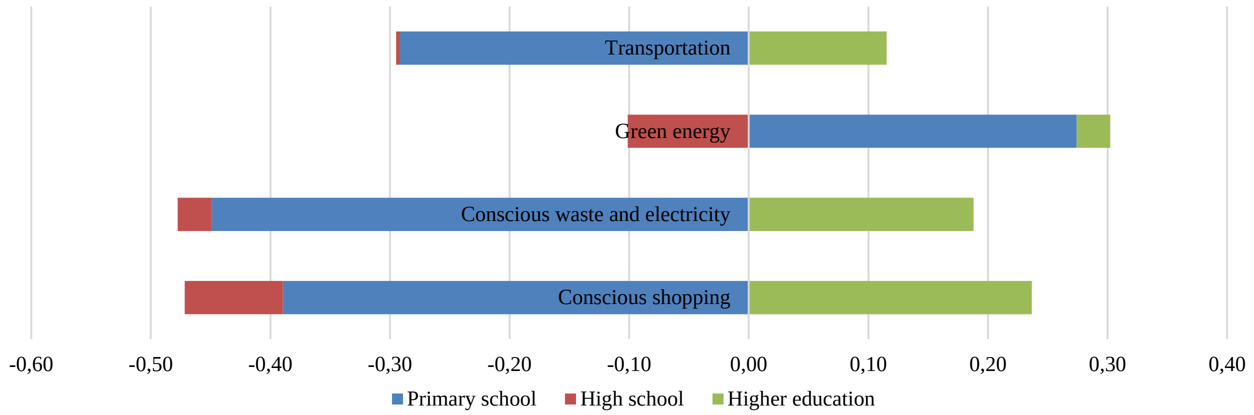

Figure 6 Education differences in principal component scores for attitude (Source: authors' own calculation) Note: the unit of principal components are meaningless, principal component scores were standardized to have unit variance. PCs can be seen in Table 1

University graduates are consistently more proactive across all environmental domains, particularly notable in conscious shopping and waste management. These figures visually demonstrate the escalating impact of higher education on both attitudes and actions, reinforcing the comprehensive influence of educational level on environmental consciousness and practical engagement, aligning with the insights from the table summary (Figure 6 and 7).

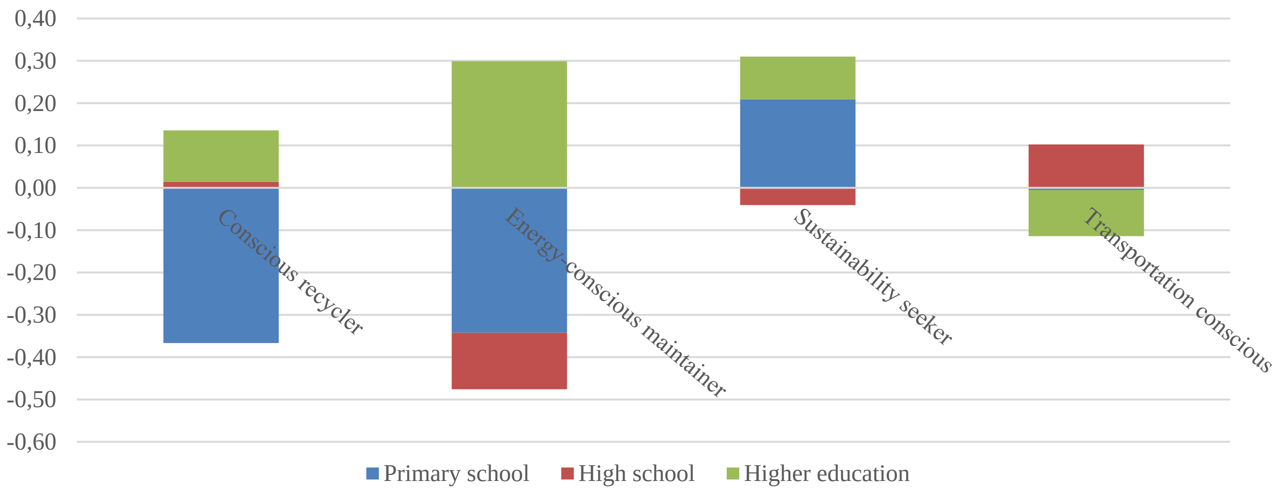

Figure 7. Education differences in principal component scores for action (Source: authors' own calculation) Note: the unit of principal components are meaningless, principal component scores were standardized to have unit variance. PCs can be seen in Table 2

Theoretical and practical implications

Our findings extend existing theoretical frameworks in several ways. First, they support Kaiser & Wilson's (2021) dual-pathway model of environmental behavior while highlighting important regional variations. The distinct factor structures for attitudes versus behaviors challenge simplistic attitude-behavior correspondence models, suggesting more complex intervention paths may be needed. Second, the demographic variations, particularly in gender and education, indicate that targeted interventions might be more effective than universal approaches. This aligns with recent theoretical work by Rodriguez-Casallas et al., (2023) on differentiated intervention strategies.

However, our findings show stronger demographic effects than their meta-analysis, suggesting potential regional specificity in Central Europe. The settlement type differences highlight crucial policy implications. While urban residents show higher environmental engagement, the lack of difference in transportation behaviors suggests that infrastructure development should precede or accompany behavioral interventions. This supports Nemeth et al.'s (2022) policy framework for sustainable urban development in Central Europe.

Contradictory findings and future directions

Several of our findings contradict recent literature. The inverse pattern in second-hand clothing behavior challenges findings from Western European studies (Vermeir et al., 2022; Andersson & Nässén, 2021), suggesting that economic factors might play a larger role in our context. Similarly, the strong gender effects in waste management contradict recent meta-analytical findings (Chen et al., 2023) showing decreasing gender gaps in environmental behavior. The lack of settlement type effects in transportation behaviors also contradicts patterns observed in Western Europe (Van Der Werff & Steg, 2021) and North America (Moghimehfar & Halpenny, 2021). This suggests that regional infrastructure differences may moderate the relationship between environmental attitudes and behaviors more strongly than previously thought.

CONCLUSION

This study investigated the relationship between environmental attitudes and behaviors, examining their factor structure and demographic determinants in a Central European context. Our findings contribute to both theoretical understanding and practical applications in environmental psychology, particularly regarding the attitude-behavior gap and demographic influences on environmental engagement.

Research Questions Addressed

Our investigation of the factor structure of environmental attitudes and behaviors revealed distinct dimensional patterns, with four clear factors emerging for both attitudes and behaviors. This finding extends previous theoretical frameworks by demonstrating that environmental consciousness operates through different pathways in belief systems versus actual behaviors. The identified factors - Conscious Shopping and Product Use, Waste and Energy Management, Green Energy Advocacy, and Transportation Consciousness - suggest that environmental behaviors cluster in meaningful ways that can inform intervention strategies.

The examination of the attitude-behavior gap showed significant disparities between environmental attitudes and corresponding actions across most behavioral domains. However, the magnitude of these gaps varied considerably, with the largest discrepancies observed in renewable resource usage and conscious shopping. Notably, our finding of inverse patterns in second-hand clothing behavior suggests that economic factors may sometimes drive apparently environmental behaviors, adding nuance to existing theories about the attitude-behavior relationship.

Regarding demographic influences, our results revealed significant patterns across gender, education level, and settlement type. Women consistently demonstrated higher environmental engagement, particularly in waste management and conscious shopping, while education level showed strong positive associations with environmental behavior across multiple domains. The urban-rural divide in environmental engagement highlighted the crucial role of infrastructure accessibility in enabling environmental action.

Theoretical Implications

Our findings extend existing theoretical frameworks in several ways. First, they demonstrate the importance of considering both attitudinal and behavioral dimensions separately when examining environmental engagement. Second, they highlight the role of contextual factors in moderating the attitude-behavior relationship. Third, they suggest that demographic factors influence environmental behavior through multiple pathways, requiring more nuanced theoretical models.

Practical Implications

The results offer several practical implications for policymakers and environmental educators:

1. Environmental interventions should be tailored to specific demographic groups, recognizing the different patterns of engagement across population segments.
2. Infrastructure development should precede or accompany behavioral interventions, particularly in rural areas where structural constraints may limit environmental action.
3. Educational programs should focus on closing the attitude-behavior gap by addressing specific barriers to action implementation.

Broader Impact

This research contributes to our understanding of environmental behavior in several ways. It provides empirical evidence for the complex relationship between attitudes and behaviors, demonstrates the importance of demographic factors in environmental engagement, and highlights the role of contextual factors in enabling or constraining environmental action. These findings are particularly relevant for societies transitioning toward more sustainable practices while dealing with infrastructure and economic constraints.

The study's results suggest that promoting environmental behavior requires a multi-faceted approach that considers both individual characteristics and contextual factors. The clear patterns of demographic differences indicate that targeted interventions might be more effective than universal approaches, while the varying magnitude of attitude-behavior gaps across different domains suggests that some behaviors might be more amenable to change than others.

Limitations and future research

While this study provides valuable insights into environmental attitudes and behaviors, several limitations should be considered when interpreting the results and planning future research. The cross-sectional nature of our data limits causal inferences about the relationships between demographics and environmental behaviors. While we identified significant associations, the temporal stability of these relationships remains unknown. Additionally, our sample, while substantial (N = 1014), represents a specific temporal and geographic context, potentially limiting generalizability to other regions or time periods. Our reliance on self-reported behaviors may have introduced social desirability bias, particularly for environmentally conscious actions. Although we found significant attitude-behavior gaps, these might be underestimated due to participants' tendency to overreport socially desirable behaviors.

Furthermore, our measurements captured intended rather than observed behaviors, which may not perfectly reflect actual environmental actions. While factor analysis revealed distinct dimensions of environmental attitudes and behaviors, the explained variance (64.61% for attitudes and 66.65% for behaviors) suggests that some aspects of environmental consciousness might not be captured by our measurement model. Additionally, the binary nature of some demographic variables (particularly gender) may oversimilplify more complex demographic influences.

Future research directions

Future research should employ longitudinal designs to track the evolution of attitude-behavior gaps over time. Such studies would enable examination of how life transitions affect environmental behaviors and investigation of the stability of factor structures across different time periods. This approach would also allow for assessment of the long-term impact of demographic factors on environmental engagement.

We recommend that future studies incorporate objective behavioral measures alongside self-reports. More sophisticated measurement tools for specific environmental behaviors should be developed. The field would benefit from mixed-methods approaches to capture qualitative aspects of environmental decision-making. Implementation of experimental designs would enable testing of causal relationships. Further research should explore the interaction effects between different demographic factors and the role of social networks in environmental behavior adoption. The influence of cultural values on the attitude-behavior gap merits investigation, as does the impact of economic constraints on environmental decision-making. Future studies should investigate how infrastructure differences affect environmental behavior implementation. The role of local policies in facilitating or hindering environmental actions requires examination. Cross-cultural comparisons of attitude-behavior gaps would provide valuable insights, as would studies of the impact of economic development on environmental engagement patterns.

Research is needed to evaluate the effectiveness of targeted interventions based on demographic factors. Development and testing of tailored environmental education programs should be prioritized. Assessment of the impact of infrastructure improvements on behavioral changes would provide practical insights for policymakers. The role of economic incentives in promoting environmental behaviors requires further investigation. These limitations and future directions suggest several methodological improvements for subsequent studies.

Research designs should include both observational and self-report measures while implementing multi-wave data collection. The incorporation of geographic information system (GIS) data for infrastructure analysis would strengthen future studies. More nuanced demographic measures should be developed, and economic indicators at both individual and community levels should be included. The field would benefit from research that addresses these limitations while building upon the findings presented in this study. Special attention should be paid to developing more robust measurement tools and implementing research designs that can better capture the complex interactions between individual characteristics, contextual factors, and environmental behaviors.

Author Contributions: Conceptualization, A.M. and A.L.; methodology, A.M. and S.K and A.L.; formal analysis, V. F and Z.B.and É.B.B and A.L.; data curation, S.K and A. L. and É.B.B.; writing - original draft preparation, A.M. and É.B.B.; writing - review and editing, A.L. and V.F. and Z.B; visualization, A.L. and S.K.; supervision, A.L and S.K and É.B.B. and A.M.; project administration, V.F. and A.L. and É.B.B. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgments: The publication was supported by the project "Investigating the Role of Sport and Physical Activity for a Healthy and Safe Society in the Individual and Social Sustainability of Work Ability and Quality of Work and Life (multidisciplinary research umbrella program)".

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes,* 50(2), 179-211. https://doi.org/10.1016/0749-5978(91)90020-T

Al Fahmawee, E. A. D., & Jawabreh, O. (2023). Sustainability of green tourism by international tourists and its impact on green environmental achievement: Petra heritage, Jordan. *Geo Journal of Tourism and Geosites*, *46*(1), 27-36. https://doi.org/10.30892/gtg.46103-997

Alreahi, M., Bujdosó, Z., Lakner, Z., Pataki, L., Zhu, K., Dávid, L. D., & Kabil, M. (2023). Sustainable tourism in the post-cOvID-19 era: Investigating the effect of green practices on hotels attributes and customer preferences in Budapest, Hungary. *Sustainability*, 15(15), 11859. https://doi.org/10.3390/su151511859

Andersson, K., Nilsson, A., & Hedesström, M. (2022). Urban-rural differences in sustainable behaviors: A Nordic perspective. *Environmental Psychology Review*, 33(2), 145-168. https://doi.org/10.1080/15487733.2022.1891744

Bamberg, S., & Möser, G. (2007). Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of pro-environmental behaviour. *Journal of Environmental Psychology*, 27(1), 14-25. https://doi.org/10.1016/j.jenvp.2006.12.002

Berenguer, J., Corraliza, J. A., & Martin, R. (2005). Rural-urban differences in environmental concern, attitudes, and actions. *European Journal of Psychological Assessment*, 21(2), 128-138. https://doi.org/10.1027/1015-5759.21.2.128

Blake, J. (1999). Overcoming the 'value-action gap' in environmental policy. *Local Environment*, 4(3), 257-278. https://doi.org/10.1080/13549839908725599

Borges, C., de Freitas, R. R., & de Melo, A. Y. I. (2021). Vulnerabilidade e capacidade adaptativa de uma comunidade pesqueira pós-furacão Catarina. *Revista Ibero-Americana de Ciências Ambientais*, *12*(5), 655-670. https://doi.org/10.6008/CBPC2179-6858.2021.005.0051

Chen, X., Peterson, M. N., Lu, C., & Hong, D. (2023). Gender differences in environmental behaviors: A meta-analysis of 20 years of research. *Environment and Behavior*, 55(2), 147-169. https://doi.org/10.1177/00139165211069371

Confente, I., Mazzoli, V., Camatti, N., & Bertocchi, D. (2024). Integrating tourists' walk and talk: a methodological approach for tracking and analysing tourists' real behaviours for more sustainable destinations. *Journal of Sustainable Tourism*, 1-21. https://doi.org/10.1080/09669582.2024.2322120

Czibere, I., & Nagy, Z. É. (2020). Regional differences in environmental attitudes and behaviors: A case study of Hungarian communities. *Eastern European Countryside*, 26(1), 27-51. https://doi.org/10.12775/eec.2020.002

Dąbrowski, L. S., Środa-Murawska, S., Smoliński, P., & Biegańska, J. (2022). Rural–urban divide: Generation Z and pro-environmental behaviour. *Sustainability*, *14*(23), 16111. https://doi.org/10.3390/su142316111

Davidson, D. J., & Freudenburg, W. R. (1996). Gender and environmental risk concerns: A review and analysis of available research. *Environment and Behavior*, 28(3), 302-339. https://doi.org/10.1177/0013916596283003

Dietz, T., Kalof, L., & Stern, P. C. (2002). Gender, values, and environmentalism. *Social Science Quarterly*, 83(1), 353-364. https://doi.org/10.1111/1540-6237.00088

Esparza-Huamanchumo, R. M., Botezan, I., Sanchez-Jimenez, R., & Villalba-Condori, K. O. (2024). Ecotourism, sustainable tourism and nature based tourism: an analysis of emerging fields in tourism scientific literature. *Geojournal of Tourism and Geosites*, *54*, 953-966. https://doi.org/10.30892/gtg.542spl19-1270

Fenitra, R. M., Tanti, H., Gancar, C. P., & Indrianawati, U. (2021). Understanding younger tourist'intention toward environmentally responsible behavior. *Geojournal of Tourism and Geosites*, *36*, 646-653. https://doi.org/10.30892/gtg.362spl12-694

Gifford, R., & Nilsson, A. (2014). Personal and social factors that influence pro-environmental concern and behaviour: A review. *International Journal of Psychology*, 49(3), 141-157. https://doi.org/10.1002/ijop.12034

Gonda, T., & Rátz, T. (2021). Attitudes towards responsible tourism among Hungarian population. *GeoJournal of Tourism and Geosites*, 39(4), 1237-1245. https://doi.org/10.30892/gtg.46126-1020

Grilli, G., & Curtis, J. (2021). Encouraging pro-environmental behaviours: A review of methods and approaches. *Renewable and Sustainable Energy Reviews*, *135*, 110039. https://doi.org/10.1016/j.rser.2020.110039

Hines, J. M., Hungerford, H. R., & Tomera, A. N. (1987). Analysis and synthesis of research on responsible environmental behavior: A meta-analysis. *The Journal of Environmental Education*, 18(2), 1-8. https://doi.org/10.1080/00958964.1987.9943482

Huddart-Kennedy, E., Beckley, T. M., McFarlane, B. L., & Nadeau, S. (2009). Rural-urban differences in environmental concern in Canada. *Rural Sociology*, 74(3), 309-329. https://doi.org/10.1526/003601109789037268

Ilieș, D. C., Baias, S., Buhaș, R., Ilieș, A., Herman, G. V., Gaceu, O., Dumbravă, R., & Măduța, F. M. (2017). Environmental education in protected areas. Case study from Bihor County, Romania. *GeoJournal of Tourism and Geosites*, *19*(1), 126-132.

Kaiser, F. G. (1998). A general measure of ecological behavior. *Journal of Applied Social Psychology*, 28(5), 395-422. https://doi.org/10.1111/j.1559-1816.1998.tb01712.x

Kaiser, F. G., & Wilson, M. (2021). The theory of planned behavior: Refinements and alternatives for environmental psychology. *European Review of Social Psych*ology, 32(2), 1-38. https://doi.org/10.1080/10463283.2021.1991178

Khan, N., Acuti, D., Lemarie, L., & Viglia, G. (2024). The intention-behaviour gap in sustainable hospitality: a critical literature review. *International Journal of Contemporary Hospitality Management*, *36*(5), 1627-1646. https://doi.org/10.1108/IJCHM-06-2023-0840

Kiriwongwattana, K., & Waiyasusri, K. (2024). Spatial evolution of smart cities for sustainable tourism: a case study of Phuket province, Thailand. *Geojournal of Tourism and Geosites*, *55*(3), 1312-1320. https://doi.org/10.30892/gtg.55331-1303

Klineberg, S. L., McKeever, M., & Rothenbach, B. (1998). Demographic predictors of environmental concern: It does make a difference how it's measured. *Social Science Quarterly*, 79(4), 734-753. https://www.jstor.org/stable/42863844

Klöckner, C. A. (2013). A comprehensive model of the psychology of environmental behaviour—A meta-analysis. *Global Environmental Change*, 23(5), 1028-1038. https://doi.org/10.1016/j.gloenvcha.2013.05.014

Kovács, S., Szabó, B., & Kiss, K. (2021). Educational attainment and environmental behavior in Hungary: A multilevel analysis. *Sustainability*, 13(8), 4289. https://doi.org/10.3390/su13084289

Krajhanzl, J., Chabada, T., & Svobodová, R. (2021). Environmental behavior in Central Europe: A comparative study of attitudes and actions. *Journal of Cleaner Production*, 315, 128171. https://doi.org/10.1016/j.jclepro.2021.128171

Lange, F., Berger, S., Byrka, K., Brugger, A., Henn, L., Sparks, A. C., Nielsen, K. S., & Urban, J. (2023). Beyond self-reports: A call for more behavior in environmental psychology. *Journal of Environmental Psychology*, *86*. https://doi.org/10.1016/j.jenvp.2023.101965

Larson, L. R., Stedman, R. C., Cooper, C. B., & Decker, D. J. (2015). Understanding the multi-dimensional structure of pro-environmental behavior. *Journal of Environmental Psychology*, 43, 112-124. https://doi.org/10.1016/j.jenvp.2015.06.004

Li, Y., Wang, B., & Cui, M. (2022). Environmental concern, environmental knowledge, and residents' water conservation behavior: Evidence from China. *Water*, 14(13), Article 2087. https://doi.org/10.3390/w14132087

Liu, P., & Zhang, Y. (2023). Infrastructure and environmental behavior: A meta-analysis of moderating effects. *Journal of Environmental Psychology*, 85, 101881. https://doi.org/10.1016/j.jenvp.2022.101881

Loureiro, S. M. C., Guerreiro, J., & Han, H. (2022). Past, present, and future of pro-environmental behavior in tourism and hospitality: A text-mining approach. *Journal of Sustainable Tourism*, *30*(1), 258-278. https://doi.org/10.1080/09669582.2021.1875477

Martinez-Borreguero, G., Maestre-Jiménez, J., & Naranjo-Correa, F. L. (2023). Environmental education effectiveness: Beyond self-reported measures. *Environmental Education Research*, 29(2), 298-319. https://doi.org/10.1080/13504622.2022.2156439

Matthies, B. D., Vainio, A., & D'Amato, D. (2018). Not so biocentric – Environmental benefits and harm associated with the acceptance of forest management objectives by future environmental professionals. *Ecosystem Services*, 29, 128–136. https://doi.org/10.1016/j.ecoser.2017.12.003

McCright, A. M. (2010). The effects of gender on climate change knowledge and concern in the American public. *Population and Environment*, 32(1), 66-87. https://doi.org/10.1007/s11111-010-0113-1

Meyer, A. (2015). Does education increase pro-environmental behavior? Evidence from Europe. *Ecological Economics*, 116, 108-121. https://doi.org/10.1016/j.ecolecon.2015.04.018

Moghimehfar, F., & Halpenny, E. A. (2021). Environmental behavior factors: A cross-cultural comparison. *Journal of Sustainable Tourism*, 29(4), 539-559. https://doi.org/10.1080/09669582.2020.1825458

Nemeth, B., Varjú, V., & Kovács, A. D. (2022). Sustainable urban development in Central Europe: Policy challenges and opportunities. *Cities*, 120, 103441. https://doi.org/10.1016/j.cities.2021.103441

Oskamp, S., Harrington, M. J., Edwards, T. C., Sherwood, D. L., Okuda, S. M., & Swanson, D. C. (1991). Factors influencing household recycling behavior. *Environment and Behavior*, 23(4), 494-519. https://doi.org/10.1177/0013916591234005

Pasek, M., & Ratkowski, W. (2021). Participation in ecotourism education, gender and place of residence as determinants of attitudes towards sustainable tourism. *Geo Journal of Tourism and Geosites*, *35*(2), 406-410. https://doi.org/10.30892/gtg.35219-665

Pisano, I., & Lubell, M. (2017). Environmental behavior in cross-national perspective: A multilevel analysis of 30 countries. *Environment and Behavior*, 49(1), 31-58. https://doi.org/10.1177/0013916515600494

Rodriguez-Casallas, J. D., Luo, W., & Kristensen, H. S. (2023). Differentiated intervention strategies for promoting sustainable consumption: A meta-analytical review. *Sustainable Production and Consumption*, 35, 156-172. https://doi.org/10.1016/j.spc.2022.11.003

Schwartz, S. H. (1977). Normative influences on altruism. *Advances in Experimental Social Psychology*, 10, 221-279. https://doi.org/10.1016/S0065-2601(08)60358-5

Shove, E. (2010). Beyond the ABC: Climate change policy and theories of social change. *Environment and Planning* A, 42(6), 1273-1285. https://doi.org/10.1068/a42282

Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology*, 29(3), 309-317. https://doi.org/10.1016/j.jenvp.2008.10.004

Stern, P. C. (2022). Contributions of psychology to meeting global environmental challenges. *Annual Review of Psychology*, 73, 279-303. https://doi.org/10.1146/annurev-psych-020821-110045

Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A value-belief-norm theory of support for social movements: The case of environmentalism. *Human Ecology Review*, 6(2), 81-97. https://www.jstor.org/stable/24707060

Swain, S., & Sthapak, S. (2022). Socio-demographic analysis of host communitie's support for tourism development in the heritage destination of puri, india. *GeoJournal of Tourism and Geosites*, 44(4), 1427–1434. https://doi.org/10.30892/gtg.44430-962

Thaler, A., Karner, S., Yennie Bredin, G., Brown, H. F., Franklin, A., Gundersen, V., Home, R., Ludhra, G., Podlaszewska, A., Sabir, G., Saydaliev, Z., Soliev, I., Steinwender, D., & Wähler, T. (2023). *Methodological framework for intersectionality analysis* (No. D1, p. 3). Report.

Thompson, S., Kumar, A., & Nayak, J. K. (2023). Environmental attitude-behavior gap: A systematic review and meta-analysis. *Journal of Business Research*, 158, 113688. https://doi.org/10.1016/j.jbusres.2022.113688

Uddin, M. K. (2024). Environmental education for sustainable development in Bangladesh and its challenges. *Sustainable Development*, *32*(1), 1137-1151. https://doi.org/10.1002/sd.2728

Upham, P., Whitmarsh, L., Poortinga, W., Purdam, K., Darnton, A., McLachlan, C., & Devine-Wright, P. (2009). *Public attitudes to environmental change: A selective review of theory and practice*. Research Councils UK. https://doi.org/10.13140/RG.2.2.22223.87205

Urban, J., & Zvěřinová, I. (2016). Structure of domestic waste management behavior in households: A Central European case study. *Journal of Environmental Psychology*, 48, 156-165. https://doi.org/10.1016/j.jenvp.2016.10.001

Van Der Werff, E., & Steg, L. (2021). Urban-rural differences in environmental behavior: A European perspective. *Global Environmental Change*, 69, 102287. https://doi.org/10.1016/j.gloenvcha.2021.102287

Van Liere, K. D., & Dunlap, R. E. (1980). The social bases of environmental concern: A review of hypotheses, explanations and empirical evidence. *Public Opinion Quarterly*, 44(2), 181-197. https://doi.org/10.1086/268583

Vermeir, I., Weijters, B., De Houwer, J., & Van de Weghe, N. (2022). Second-hand consumption patterns in Europe: A multilevel analysis. *Journal of Consumer Psychology*, 32(2), 324-342. https://doi.org/10.1002/jcpy.1289

Whitmarsh, L. (2009). Behavioural responses to climate change: Asymmetry of intentions and impacts. *Journal of Environmental Psychology*, 29, 13–23. https://doi.org/10.1016/j.jenvp.2008.05.003

Xiao, C., & McCright, A. M. (2015). Gender differences in environmental concern: Revisiting the institutional trust hypothesis in the USA. *Environment and Behavior*, 47(1), 17-37. https://doi.org/10.1177/0013916513491571

Zsóka, Á., Szerényi, Z. M., Széchy, A., & Kocsis, T. (2013). Greening due to environmental education? Environmental knowledge, attitudes, consumer behavior and everyday pro-environmental activities of Hungarian high school and university students. *Journal of Cleaner Production*, 48, 126-138. https://doi.org/10.1016/j.jclepro.2012.11.030

Article history: Received: 04.12.2024 Revised: 25.04.2025 Accepted: 22.05.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1041-1056
DOI 10.30892/gtg.602spl02-1478

FOREST-BASED ECOTOURISM IN INDONESIA: A COMPREHENSIVE REVIEW OF POLICY CHALLENGES, DIVERSE PRACTICES, STAKEHOLDER ENGAGEMENT, CONSERVATION EFFORTS, AND SOCIOECONOMIC ASPECTS

Moh. Andika LAWASI [1*], Ndoheba KENDA [1], Tri Rizkiana YUSNIKUSUMAH [2], Boby Bagja PRATAMA [3], Dian PRATIWI [2], Ane Dwi SEPTINA [4], Enkin ASRAWIJAYA [1]

[1] National Research and Innovation Agency (BRIN), Research Center for Society and Culture, Jakarta, Indonesia; andika.lawasi@gmail.com, moha072@brin.go.id (M.A.L.); ndoh001@brin.go.id (N.K.); enki001@brin.go.id (E.A.)
[2] National Research and Innovation Agency (BRIN), Research Center for Ecology and Ethnobiology, Bogor, Indonesia; trir005@brin.go.id (T.R.Y.); dian078@brin.go.id (D.P.)
[3] National Research and Innovation Agency (BRIN), Research Center for Conservation of Marine and Inland Water Resources, Bogor, Indonesia; boby002@brin.go.id (B.B.P.)
[4] National Research and Innovation Agency (BRIN), Research Center for Population, Jakarta, Indonesia; anedwiseptina@gmail.com (A.D.S.)

Citation: Lawasi, M.A., Kenda, N., Yusnikusumah, T.R., Pratama, B.B., Pratiwi, D., Septina, A.D., & Asrawijaya, E. (2025). Forest-based ecotourism in Indonesia: A comprehensive review of policy challenges, diverse practices, stakeholder engagement, conservation efforts, and socioeconomic aspects. *Geojournal of Tourism and Geosites*, 60(2spl), 1041–1056. https://doi.org/10.30892/gtg.602spl02-1478

Abstract: Forest-based ecotourism in Indonesia has great potential to support conservation and economic growth. However, the multidimensional dynamics surrounding it remain poorly mapped. This study fills this gap by conducting a comprehensive literature review of 71 articles from Scopus and Google Scholar (2014–2024) and critically examining several key dimensions, including the interplay between policy issues, management practices, stakeholder engagement, conservation initiatives, and socio-economic impacts. Findings show that previous research remains fragmented on partial aspects such as policy issues (overlapping regulations), inconsistencies in management practices, and inequalities in stakeholder participation. While forest-based ecotourism can enhance community livelihoods and biodiversity protection (particularly in mangroves, tropical rainforests, and peri-urban settings), its development is hindered by fragmented governance, infrastructure disparities (notably between western-central and eastern regions), land tenure conflicts, urbanization, and stakeholder disputes. The study also identified three important policy pillars from the literature synthesis: (1) collaborative adaptive governance through a penta-helix approach (government, community, academia, private sector, media); (2) incentive-based eco-label certification schemes for sustainable practices such as waste management and habitat restoration; (3) environmental education programs for tourists and operators. In addition, the review highlights the importance of spatial justice, participatory planning, and ecological carrying capacity, especially in mangrove and forest village contexts. Local culture, wellness-based tourism, and conservation education are also identified as transformative elements for long-term sustainability. Empirical examples show how diversified ecotourism models (from urban forests to wildlife-based tourism) can promote inclusive development and local resilience. Community empowerment, benefit-sharing, and green infrastructure investment are repeatedly emphasized as drivers of sustainability. The conclusion confirms that the success of forest-based ecotourism depends on balancing ecological regeneration and tourism use. Multidimensional policy synergies are needed to position ecotourism as a catalyst for achieving the Sustainable Development Goals (SDGs), particularly biodiversity conservation and poverty alleviation.

Keywords: forest-based ecotourism, sustainable tourism, forest conservation, cultural heritage, literature review

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INTRODUCTION

In recent years, Indonesia has witnessed a notable advancement in its forest-based ecotourism sector, coinciding with the mounting recognition among the global community of the paramount significance of environmental conservation (Insani et al., 2024). Indonesia, which is among the top 10 countries worldwide in terms of forest area, has also been identified as one of the 10 countries with the highest potential for ecotourism development. This potential is evidenced by the presence of 172 ecotourism sites dispersed across numerous islands, including Sumatra, Jawa, Kalimantan, Bali, Nusa Tenggara, and Papua (Sisriany & Furuya, 2024). A significant proportion of these sites are situated within protected areas, such as national parks and protected forests, which are home to a diverse array of endemic species. While this growth in ecotourism offers considerable promise, it also poses a critical question: how can these forest areas, which possess high ecological value, be managed sustainably without repeating the exploitative mistakes of the past?

The paradigm shifts in forest management, from the exploitation of timber products to the utilization of environmental services, position forest-based ecotourism as a strategic option. This transition is not solely driven by economic interests to

[*] Corresponding author

augment regional income, but also by the imperative to preserve biodiversity (Sisriany & Furuya, 2024). This concept is in alignment with global trends that currently support movements to restore ecosystem functions as the primary life support system and to encourage the creation of opportunities for local communities to be more involved in the maintenance and utilization of forests in a responsible manner (Ginantra et al., 2021; Mulyadi & Hamidy, 2021).

The involvement of local communities in forest management under the paradigm of ecotourism has the potential to yield multifaceted impacts and benefits, encompassing not only environmental sustainability but also the optimization of local cultural potential. For instance, communities situated in forest areas can leverage their indigenous knowledge and expertise to offer services as traditional tour guides, provide accommodations imbued with local cultural nuances, and promote and market local handicrafts (Ernawati et al., 2018). This, in turn, is expected to positively impact on the sustainability of local culture, which is anticipated to become the focal point of ecotourism, bolstered by the distinctiveness of the surrounding landscape. However, it is crucial to judiciously balance the imperatives of cultural preservation and tourism. In certain locales, concerns have been raised that the high influx of tourism may result in the excessive modification of cultural practices, thereby jeopardizing the authenticity of local traditions (Andarani et al., 2018).

The challenges are further compounded when associated with environmental aspects, as ecotourism activities must not only address cultural dynamics, but also ensure ecological sustainability. Well-managed tourism activities can serve as a viable alternative livelihood, thereby deterring destructive practices such as illegal logging and hunting (Hartanti et al., 2018). However, in certain regions, the implementation of environmental sustainability principles remains underdeveloped due to inadequate regulations and oversight (Yarhamdhani et al., 2024). Adverse consequences such as erosion, sedimentation, and water contamination persist in ecotourism destinations that demonstrate insufficient regard for environmental capacity and are inadequately managed.

Within the context of governance, forest-based ecotourism in Indonesia still confronts numerous structural challenges. The various institutions involved in forest management, ranging from the central government and local governments to conservation agencies, can trigger overlapping policies and slow down the coordination process (Hengky & Kikvidze, 2018; Satyatama et al., 2020). On the other hand, community participation is uneven due to varying managerial capacity and conservation literacy. These constraints are further compounded by external pressures, including climate change, natural disasters, and competition with more advanced overseas nature tourism destinations (Sumarmi et al., 2022).

While the potential of forest-based ecotourism in Indonesia to support conservation and stimulate local economies is evident (Insani et al., 2024; Sisriany & Furuya, 2024), the multidimensional dynamics surrounding it have yet to be comprehensively mapped. Prior studies have identified several aspects, including policy issues (Hengky & Kikvidze, 2018; Satyatama et al., 2020), inconsistencies in management methods (Ginantra et al., 2021; Yarhamdhani et al., 2024), and inequalities in stakeholder engagement (Ernawati et al., 2018; Sumarmi et al., 2022). However, there is a paucity of research that systematically links the various dimensions of policy, field practice, stakeholder engagement, conservation initiatives, socio-economic impacts, and the integration of local wisdom in governance. Indeed, the interaction between these factors is critical to understanding the long-term sustainability of forest-based ecotourism (Sisriany & Furuya, 2024; Zainal et al., 2024).

Therefore, this article seeks to systematically outline and analyze the evolution of forest-based ecotourism in Indonesia through a critical review of various existing field studies to understand several aspects, including policy challenges that hinder cross-sector coordination, such as regulatory overlaps and suboptimal institutional capacity; analyzing the diversity of practices in ecotourism management, including community-based models, mangroves, urban forests, and local wisdom, as well as identifying the driving and inhibiting factors; evaluating the level of stakeholder engagement, particularly the role of local communities, local governments, and NGOs, in designing inclusive and equitable ecotourism schemes, considering the dynamics of resource conflict; assessing the effectiveness of conservation efforts integrated with ecotourism activities, including mitigating environmental impacts such as erosion, changes in forest cover, and urbanization pressure; as well as measuring the socioeconomic contributions of forest ecotourism to community welfare, and the tensions between cultural commercialization, unequal benefit distribution, and the preservation of local wisdom.

MATERIALS AND METHODS

The method used in this study is a literature review (Snyder, 2019) aimed not only at comprehensively understanding the development of research on forest-based ecotourism in Indonesia but also at critically evaluating and synthesizing the existing body of work. This approach began with a systematic search of two primary databases, Scopus and Google Scholar (GS), to optimize the breadth of scientific resources. The technical specifications of the document search are presented in Table 1 and 2 below.

Table 1. Summary of document search and selection in Scopus

Parameters	Note
Keywords	forest AND ecotourism AND Indonesia
Boolean Search Query	TITLE-ABS-KEY(forest AND ecotourism AND Indonesia) AND PUBYEAR > 2013 AND PUBYEAR < 2025 AND (LIMIT-TO (EXACTKEYWORD,"Ecotourism") OR LIMIT-TO (EXACTKEYWORD,"Tourism Development") OR LIMIT-TO (EXACTKEYWORD,"Sustainable Tourism") OR LIMIT-TO (EXACTKEYWORD,"Tourism Management") OR LIMIT-TO (EXACTKEYWORD,"Tourist Destination") OR LIMIT-TO (EXACTKEYWORD,"Eco-tourism Areas") OR LIMIT-TO (EXACTKEYWORD,"Ecotourism Management") OR LIMIT-TO (EXACTKEYWORD,"Eco-tourism") OR LIMIT-TO (EXACTKEYWORD,"Tourism Village") OR LIMIT-TO (EXACTKEYWORD,"Community-based Tourism")
Range	2014–2024
Document Founds	**73 articles**

Table 2. Stages of document search and selection in Google Scholar

Search Stages	Numb. of Documents
First screening by keywords "ecotourism in Indonesia"	96.300
Unchecked Citation	83.500
Citation range (2014–2024)	17.900
Screening title	320
Screening title (with at least one word 'forest')	25
Results	**25 articles**

Subsequently, from the total of 98 gathered articles (73 from scopus, 25 from GS), exclusion criteria were implemented to eliminate duplication/redundancy, exclude studies that do not explicitly address forest ecotourism, and discard articles that concentrate solely on narrow facets (such as laboratory studies or specific biological entities) that lack relevance. After that process, the number of articles that satisfied the final criteria totaled 71. The data were examined using descriptive and qualitative methods and are reported in the subsequent section (see Figure 1).

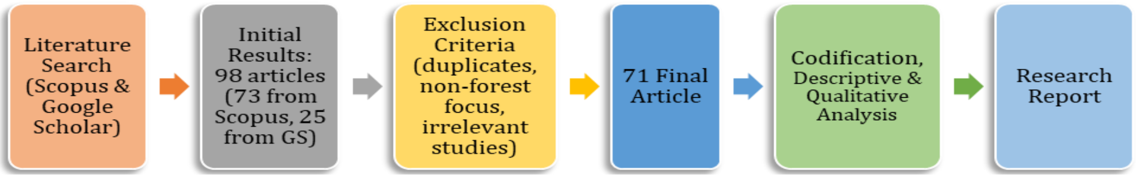

Figure 1. Steps of conducting reviews

RESULTS AND DISCUSSION

1. Challenges and Policy Dynamics

1.1. Challenges and Strategies for Developing Forest-Based Ecotourism

The development of forest-based ecotourism in Indonesia shows various interconnected challenges and development strategies. Table 3 below summarizes the main aspects that emerge in the literature review, including regional disparities, infrastructure limitations, stakeholder conflicts, and the need for an integrated approach.

Table 3. Challenges and strategies in developing forest-based ecotourim in Indonesia (Source: Literature review by authors, 2024)

Challenges and Strategies	Description	Locus	References
Regional Disparities in Forest-Based Ecotourism Development	Development progresses more swiftly in the Eastern region (Papua, Nusa Tenggara) than in the Western and Central regions	Papua, Nusa Tenggara	(Anggraini & Gunawan, 2021; Sisriany & Furuya, 2024)
Limitations of Infrastructure and Facilities	The lack of accessibility, sanitary restrooms, parking facilities, secure hiking trails, and similar amenities diminishes the attractiveness.	Remote ecotourism location	(Ali et al., 2021; Ambarita et al., 2018; Anggraini & Gunawan, 2021; Ariyani & Fauzi, 2022; Basyuni et al., 2018; Harahap & Effendi, 2020; Notohamijoyo et al., 2020; Prihadi et al., 2024; Purwoko et al., 2023; Sulistyorini et al., 2022)
Disaster-Prone Area	Mangrove coastlines are threatened by erosion, requiring a comprehensive mitigation strategy	Mangrove coast	(Insani et al., 2024; Wardhani et al., 2022)
Stakeholder Conflicts	The vagueness of licenses and land disputes among the community, government, and private sector impact conservation and economic allocation.	Multi-stakeholder forest area	(Abdillah, 2023; Hartoyo et al., 2021; Hitchner et al., 2009; Yarhamdhani et al., 2024; Yuwono et al., 2021)
Urbanization and Land Use Change	Urbanization and the increase in tourists without regulation reduce environmental carrying capacity.	Bogor Botanical Garden; Mangrove Bedul, East Java)	(Hengky & Kikvidze, 2018; Sumarmi et al., 2024)
Lack of Environmental Education for Visitors	The lack of education increases the risk of ecosystem degradation in vulnerable areas.	Ecologically sensitive ecotourism destination.	(Afifah et al., 2023; Hakim & Soemarno, 2017; Novianti et al., 2022; Siahaya et al., 2021)
Community-Based Management	The participation of BUMDes and the local community enhances welfare and environmental conservation.	Berjo Village, Central Java	(Fibrianto, 2020)
Development of Eco-Friendly Facilities	Birdwatching towers, educational trails, and information centers support both attraction and conservation.	Destination with interpretation facilities	(Anggraini & Gunawan, 2021; Askar et al., 2021; Harahap & Effendi, 2020; Rahmila & Halim, 2018; Vipriyanti et al., 2024)
Training Program for the Local Community	Training to enhances the capacity for professional destination management	Community around the ecotourism destination	(Arkwright & Kaomaneng, 2018; Setiawan et al., 2021)
Diversification of Tourism Products	The integration of conservation with attractions (tracking, birdwatching) supports biodiversity and tourist appeal.	Bandar Bakau (mangrove); Oelsonbai Forest	(Arfan et al., 2021; Aryantie et al., 2023; Maulana & Pratama, 2021; Mulyadi & Hamidy, 2021)

Challenges and Strategies	Description	Locus	References
The Need for an Integrated Environ-mental-Social Approach	An integrated approach is required that thoroughly addresses environmental and social dimensions	All forest ecotourism development areas	(Farid et al., 2023; Mulyadi & Hamidy, 2021)

Table 3 indicates that the advancement of the forest ecotourism sector in Indonesia exhibits considerable regional disparities. Forest-based ecotourism is more prominent in Eastern Indonesia, particularly in Papua and Nusa Tenggara, than in the Western and Central regions (Anggraini & Gunawan, 2021), despite its comparatively underdeveloped infrastructure. This mismatch not only indicates variations in the emphasis on forest tourist development but also underscores the need for enhanced focus on forest ecosystem management in areas susceptible to deforestation concerns (Sisriany & Furuya, 2024). In general, forest-based ecotourism in Indonesia still encounters numerous intricate obstacles that require significant attention to ensure its sustainability. A primary obstacle is the inadequate support services and tourism/public amenities that impede visitor access to ecotourism sites, particularly in rural areas (Ambarita et al., 2018; Anggraini & Gunawan, 2021; Ariyani & Fauzi, 2022; Basyuni et al., 2018; Notohamijoyo et al., 2020; Purwoko et al., 2023). The absence of public amenities, including sanitary restrooms, parking spaces, and secure trekking routes, aggravates this condition and diminishes the appeal of tourist locations (Ali et al., 2021; Harahap & Effendi, 2020; Prihadi et al., 2024; Sulistyorini et al., 2022). Moreover, disaster-prone areas, including mangrove coastlines at risk of erosion, necessitate thorough mitigation techniques to attain sustainable ecotourism development (Insani et al., 2024; Wardhani et al., 2022). This underscores the pressing necessity for a comprehensive strategy that incorporates environmental and socioeconomic dimensions (Farid et al., 2023; Mulyadi & Hamidy, 2021). Consequently, sustainable infrastructure is essential for facilitating forest-based ecotourism (Anggraini & Gunawan, 2021; Askar et al., 2021; Rahmila & Halim, 2018).

In addition to infrastructure issues, stakeholder conflicts present a substantial obstacle in the management of forest land for ecotourism. The vagueness of permits and land disputes frequently engenders tensions among local populations, the government, and private enterprises. This circumstance impacts the inequitable allocation of revenue and undermines the efficacy of conservation initiatives aimed at safeguarding these regions (Abdillah et al., 2023; Hitchner et al., 2009; Yarhamdhani et al., 2024). The absence of governance coordination further hinders the advancement of ecotourism, particularly in conservation zones of significant biological importance (Hartoyo et al., 2021; Yuwono et al., 2021). This conflict highlights the need for a more integrative management approach to address diverse interests.

Moreover, urbanization around ecotourism destinations adds pressure to the local ecosystem. Land use changes due to urbanization and the increase in the number of tourists, not matched by strict regulations, impact the environmental carrying capacity. Urbanization impacts habitat quality in the Bogor Botanical Gardens, whereas the significant influx of tourists in the Bedul mangrove areas of East Java results in ecosystem degradation (Hengky & Kikvidze, 2018; Sumarmi et al., 2024). The absence of educational initiatives for visitors regarding the significance of environmental preservation exacerbates the threat of ecosystem degradation, particularly in sensitive areas (Afifah et al., 2023; Hakim & Soemarno, 2017; Novianti et al., 2022; Siahaya et al., 2021). Multiple development initiatives have been employed to address this difficulty and improve ecotourism's sustainability. A notable strategy is community-based management, exemplified in Berjo Village, Central Java, where Badan Usaha Milik Desa (BUMDes) actively oversees tourist areas. This approach can substantially enhance the welfare of the local people while prioritizing environmental conservation as a fundamental aspect of ecotourism management (Fibrianto, 2020). In addition, establishing facilities such as educational pathways and information centers has shown to be an effective strategy for attracting tourists while preserving the ecosystem (Harahap & Effendi, 2020; Vipriyanti et al., 2024). Furthermore, training initiatives for the local community also enhance human resource capability for professional destination management (Arkwright & Kaomaneng, 2018; Setiawan et al., 2021).

The ecotourism development approach encompasses the diversification of tourism offerings. One example is disaster mitigation-based mangrove ecotourism in Bandar Bakau, which integrates mangrove conservation with tourist attractions such as trekking and environmental education (Arfan et al., 2021; Mulyadi & Hamidy, 2021). Another example is the growth of birdwatching tourism in Oelsonbai Forest, which promotes visitor appeal and supports biodiversity conservation (Aryantie et al., 2023; Maulana & Pratama, 2021). These models offer a comprehensive perspective on utilizing advancements in forest ecotourism management to tackle current difficulties while still leveraging unique local potential.

1.2. Policies Related to Forest-Based Ecotourism

Regulations and policies governing forest-based ecotourism in Indonesia aim to promote environmental sustainability while delivering economic and social advantages to local communities. The implementation process encounters significant challenges, especially concerning inadequate monitoring and insufficient stakeholder involvement in decision-making (Harahab et al., 2018; Hartanti et al., 2018; Hengky & Kikvidze, 2018). Monitoring constraints frequently result in a policy focus prioritizing economic considerations, while environmental preservation concerns are comparatively neglected (Feti et al., 2020). Consequently, the adaptability and efficacy of the policy framework in addressing changes are deemed crucial for the sustainable management of ecotourism (Ariyani & Fauzi, 2022; Zainal et al., 2024).

A comprehensive strategy for managing forest-based ecotourism is crucial to overcoming the previously identified implementation obstacles. This strategy should integrate ecological conservation, community economic development, and effective governance. Studies indicate that successful management necessitates the active involvement of the community and many stakeholders (Ambarita et al., 2018; Hengky & Kikvidze, 2018). Establishing community-based methods, exemplified by those executed in Gunung Leuser National Park (GLNP), serves as a model for management that promotes ecological sustainability and local economic advancement (Hartoyo et al., 2021). Furthermore, infrastructure and accessibility are critical factors that affect the efficacy of ecotourism management (Prihadi et al., 2024; Yuwono et al., 2021). In addition, policies focusing on conservation training and community-based economic empowerment are vital to enhance environmental awareness and create new business opportunities (Singgalen, 2020; Utama et al., 2023). For instance, the enactment of Qanun (local regulations) in Aceh has strengthened community involvement in environmental conservation through formal processes, while simultaneously improving their well-being (Zainal et al., 2024).

Policy evaluations from multiple studies provide significant recommendations to address existing challenges. These include infrastructural improvements, upgrades to monitoring systems, and enhanced public communication to reduce societal tensions (Abdillah, 2023; Harahab et al., 2018). Zone-based approaches and Resort-Based Management (RBM) are recommended to balance environmental conservation with economic development (Hartoyo et al., 2021). Furthermore, educational programs and the use of social media are considered effective tools for raising public awareness about the importance of ecotourism sustainability (Ambarita et al., 2018).

These ideas correspond with the evolving dynamics of natural tourist management policies in Indonesia, which have experienced substantial transformations. The original phase (1994–2010) concentrated on acknowledgment and establishing laws, whereas the period from 2012 to 2016 prioritized enhancing technical elements and zoning. From 2019 to 2020, the emphasis transitioned to investment facilitation and the integration of sustainability. This dynamic illustrates the growing complexity and response to issues in the governance of nature tourism in Indonesia (see Figure 2).

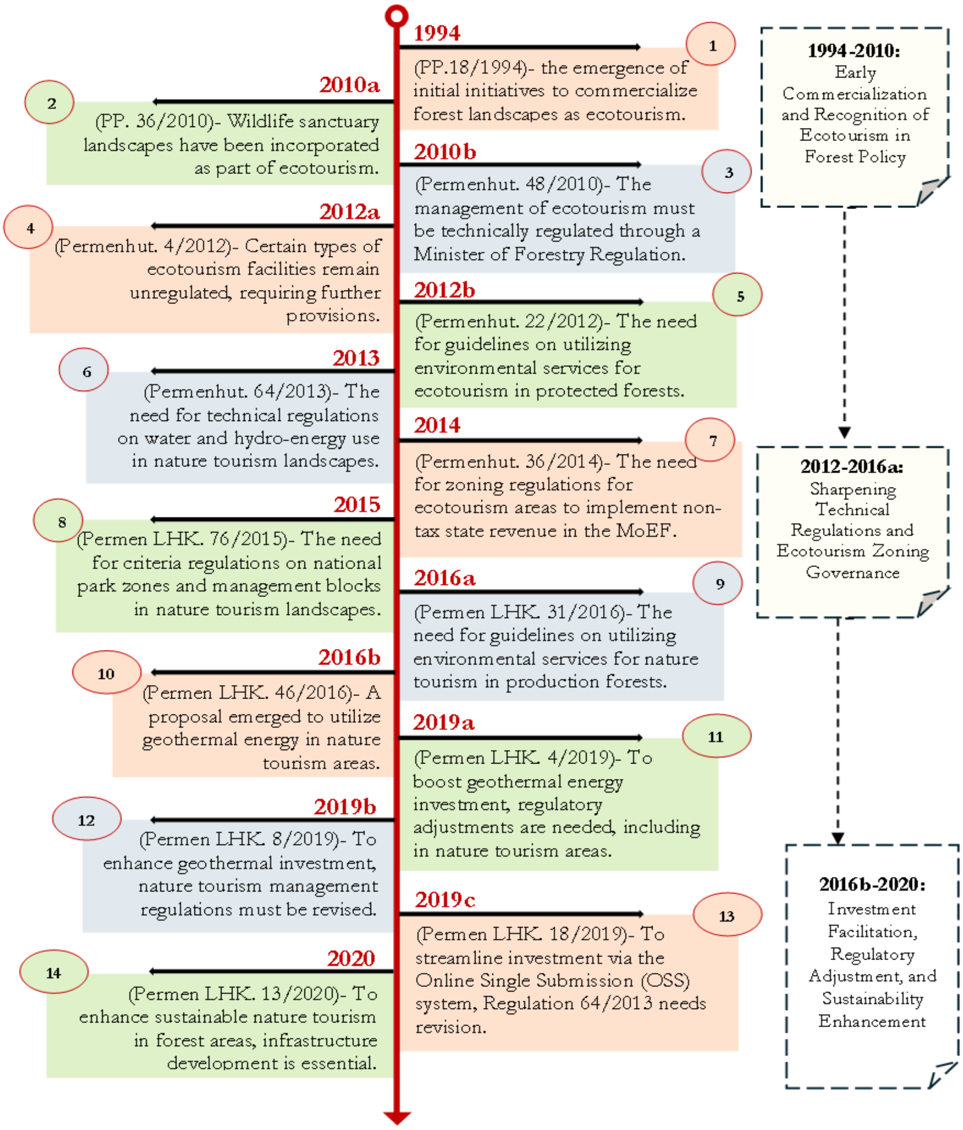

Figure 2. Timeline of nature tourism management policy in Indonesia

2. Varied Form and Practices of Forest-Based Ecotourism

2.1. Natural Forest Tourism for Ecotherapy and Health

Forest-based ecotourism in Indonesia offers a variety of management forms that reflect local potential and extraordinary ecological uniqueness. One of the most prominent models is nature-based forest ecotourism, where the main priority is the conservation of flora and fauna. Areas like the Gunung Kelam Nature Tourism Park in West Kalimantan are essential examples. Here, forest ecotherapy has been established by leveraging dense vegetation and a microclimate that enhances visitors' physical and emotional well-being (Putri et al., 2024). Another notable model integrates wellness-focused activities to foster both physical and spiritual health. For instance, the Batur Geopark in Bali adopts a "forest wellness" framework, offering meditation, yoga, nature therapy, and guided trekking. These activities not only provide immersive experiences but also educate tourists on the critical role of forest conservation (Choi et al., 2020; Mihardja et al., 2023). The administration of this area underscores the synergy between forest conservation and the enhancement of human health.

2.2. Forest Wildlife Tourism

Wildlife-based ecotourism management in Indonesia also has its appeal, offering excellent opportunities for conservation and tourism. Areas with High Conservation Value (HCV) in Sumatra, for example, have become essential locations providing great opportunities for wildlife observation, including Sumatran elephants, long-tailed macaques, leopards, wild boars, and various bird species (Erniwati & Santosa, 2024; Santosa & Kwatrina, 2024; Setiawan et al., 2021). In other locations, birdwatching activities, such as those conducted in Oelsonbai Forest, Kupang, have become a concrete form of area management that integrates conservation and community empowerment.

This program supports wildlife conservation efforts by providing a safe space for these species and offers direct economic benefits to the local community. Furthermore, this activity also raises visitors' awareness about the importance of biodiversity while encouraging the active involvement of local communities in the sustainable management of the area (Aryantie et al., 2023). Similarly, in West Lombok's Suranadi Ecotourism Area, grassroots efforts have introduced dragonfly observation activities. This initiative highlights lesser-known species' ecological roles while promoting sustainable wildlife-based tourism (Ilhamdi et al., 2021).

2.3. Urban Forest Tourism

Urban forests possess significant potential as tourist sites, particularly amid rapid urbanization. The Bogor Botanical Gardens exemplify prominence. As the city's lungs, this area serves recreational purposes and becomes a center for environmental education and conservation (Hengky & Kikvidze, 2018). Urban forests have also been enhanced in prominent cities, such as Jakarta and Surabaya, to facilitate light leisure activities, educational initiatives, and environmental conservation efforts. Initiatives like tree planting and garbage management have become essential components of ecotourism management (Abdillah et al., 2023). This phenomenon illustrates the contribution of urban green spaces to ecological equilibrium and their provision of social advantages.

2.4. Ecotourism of Mangrove Forest and Coastal Areas

Mangrove forest ecotourism has also become one of the most developed forms, particularly as a nature tourism sector that most extensively involves local communities in its management (Ali et al., 2021; Arkwright & Kaomaneng, 2018; Prihadi et al., 2024; Setyaningrum et al., 2021). For example, the mangrove forests in Bangkalan Regency and Madura Island have been transformed into educational tourism destinations involving the local community in conservation efforts (Wardhani et al., 2022). A similar situation occurs in mangrove ecotourism in Cimalaya Wetan, West Java (Pin et al., 2021), Ayah Mangrove Forest, Kebumen, Central Java (Afifah et al., 2023), and Lembung Mangrove Ecotourism, Madura (Farid et al., 2023), where mangroves become natural tourism spots aimed at environmental education as well as diversifying the income of the local community. In the mangrove areas, tourists can generally participate in activities such as mangrove planting, boating, and birdwatching, which provide a unique experience and support the preservation of coastal ecosystems (Mulyadi & Hamidy, 2021). In addition to being a coastal disaster mitigation tool, the management of this area also increases local income through community-based tourism (Ali et al., 2021; Basyuni et al., 2018; Rahmila & Halim, 2018; Vipriyanti et al., 2024). This model demonstrates how mangrove ecosystems can be sustainably utilized for various conservation and economic purposes. On the other hand, coastal and inland water-based ecotourism in mangrove forest areas also has its unique appeal. Lake Nya'deng in East Kalimantan, for example, offers a unique experience in water tourism, such as boating and enjoying the beauty of the tropical landscape (Sulistyorini et al., 2022).

This area also offers other activities, such as camping and hiking, to provide tourists with an authentic nature experience. The management of Lake Nya'deng not only focuses on environmental preservation but also on empowering the local community, thereby creating an inclusive and sustainable tourism model. Additionally, mangrove ecosystems also play an essential role in supporting the fisheries sector, and some of them have been developed as sustainable fisheries-based ecotourism areas (Arfan et al., 2021; Manullang et al., 2024). This shows that mangrove forest areas in Indonesia have many strategic dimensions related to coastal areas and aquatic areas in their management.

Therefore, many local governments, in collaboration with other stakeholders, have been striving to support the existence of mangrove-based ecotourism to remain sustainable and enduring (Novianti et al., 2022; Rudianto et al., 2021).

2.5. Village Forest Tourism

Forest villages with ecotourism potential have emerged as a primary emphasis in the advancement of community-based tourism in Indonesia. The settlements of Berjo and Sanankerto have effectively established tourist attractions that integrate natural beauty with local customs (Fibrianto, 2020). Development initiatives like the bamboo museum in Sanankerto Village exemplify innovations that amalgamate education, environmental conservation, and regional economic advancement (Maulana & Pratama, 2021). Such initiatives empower residents to engage directly in resource management, fostering a sense of ownership while improving socio-economic welfare (Fibrianto, 2020). This community-oriented strategy enables village inhabitants to actively participate in local management actively, enhancing their sense of ownership and boosting their welfare. The prospective ecotourism attractions inside forest environments are a primary emphasis in advancing this sector. The Bukit Suligi Forest Area in Riau, featuring attractions like a sea of clouds and natural caves, has become a magnet for adventure-seeking tourists (Harahap & Effendi, 2020).

Likewise, the Sipinsur geosite in Sumatra (Purwoko et al., 2023) and the Cigamea Waterfall, an ecotourism site situated inside the pine forest of Salak II Resort, Halimun-Salak Nature Reserve (Munandar et al., 2020). These areas include stunning vistas that are highly appealing to travelers who like locations characterized by rural landscapes, bodies of water, and expanses of woodland. Effectively managing these forested landscapes facilitates tropical forest conservation and yields beneficial economic outcomes for the local population. These distinctive landscapes entice travelers desiring varied experiences, rendering them the most potential ecotourism locations in the vicinity. In general, various forms and practices of forest-based ecotourism in Indonesia from the literature review can be seen in the following Table 4.

Table 4. Various Forms and Practices of Forest-Based Ecotourism in Indonesia (Source: Literature review by authors, 2024)

Ecotourism Form	Location	Main Activities	References
Nature Forest Tourism for Ecotherapy and Health	- Gunung Kelam Nature Tourism Park, West Kalimantan - Forest Wellness in Batur Geopark	Forest ecotherapy, meditation, yoga, tracking	(Choi et al., 2020; Mihardja et al., 2023; Putri et al., 2024)
Forest Wildife Tourism	- HCV area in Sumatra - Oelsonbai Forest, Kupang - Suranadi Ecotourism Area, West Lombo	Wildlife observation, birdwatching, dragonfly observation	(Aryantie et al., 2023; Erniwati & Santosa, 2024; Ilhamdi et al., 2021; Santosa & Kwatrina, 2024; Setiawan et al., 2021)
Urban Forest Tourism	- Bogor Botanical Garden - Urban Forest in Jakarta and Surabaya	Leisure activities, environmental education, conservation campaigns	(Abdillah, 2023; Hengky & Kikvidze, 2018)
Mangrove Ecotourism and Coastal Area	- Mangrove Forest in Bangkalan and Madura Island - Mangrove Cimalaya Wetan, West Java - Mangrove Lembung, Madura - Nya'deng Lake di East Kalimantan	Mangrove planting, boating, birdwatching, camping, hiking	(Afifah et al., 2023; Ali et al., 2021; Arfan et al., 2021; Arkwright & Kaomaneng, 2018; Basyuni et al., 2018; Farid et al., 2023; Manullang et al., 2024; Mulyadi & Hamidy, 2021; Novianti et al., 2022; Pin et al., 2021; Prihadi et al., 2024; Rahmila and Halim, 2018; Rudianto et al., 2021; Setyaningrum et al., 2021; Sulistyorini et al., 2022; Vipriyanti et al., 2024; Wardhani et al., 2022)
Forest Village Tourism	- Berjo Village and Sanankerto - Bukit Suligi Forest, Riau - Geosite Sipinsur, Sumatera - Cigamea Waterfall, Salak II Resort, Halimun-Salak	Natural attractions (cloud ocean, caves), cultural education (bamboo museum), tracking, adventure	(Fibrianto, 2020; I. Harahap & Effendi, 2020; Maulana & Pratama, 2021; Munandar et al., 2020; Purwoko et al., 2023)

Ecotourism in Indonesia demonstrates a diverse potential that is continually evolving through various management strategies that have been used. Ecotourism areas include natural forests, mangrove ecosystems, and forest-based villages, each presenting distinct attractions reflective of their particular attributes. The government serves as the policy maker and provider of supporting infrastructure, whilst the local community is responsible for ecological conservation and cultural preservation (Purwoko et al., 2023). The business sector contributes by providing investments and ideas that enhance the promotion of ecotourism destinations on a larger scale. The partnership among these entities is essential for the sustainability of ecotourism, considering both environmental and socio-economic factors (Andarani et al., 2018; Siahaya et al., 2021).

3. The Role of Stakeholders and Socio-Cultural Value in Ecotourism

3.1. Collaboration of the Community, Government, and Stakeholders

The collaboration between communities, the government, and stakeholders in managing forest-based ecotourism in Indonesia demonstrates a multifaceted and synergistic relationship (Ariyani & Fauzi, 2022). Local communities often play a key role as the main drivers through a community-based approach that integrates traditional values, local culture, and conservation practices (Insani et al., 2024). According to Ernawati (2018), community engagement signifies their recognition of the significance of conservation while concurrently generating economic prospects through various ecotourism initiatives. This dynamic illustrates that the community's participation serves as a foundational element that may be integrated with the functions of other stakeholders in establishing sustainable ecotourism management.

Conversely, the government is responsible for establishing regulations, constructing infrastructure, and providing technical assistance. Afifah (2023) observes that the government promotes tourist areas and rehabilitation initiatives, while prioritizing local communities as the primary managers. The co-management framework (Novianti et al., 2022), utilized in the administration of mangrove ecotourism in Karangsong (Feti et al., 2020), exemplifies effective collaboration between the government and the community, resulting in coordinated and sustainable resource management (Arfan et al., 2021). The participation of the commercial sector and NGOs enhances this relationship through funding, promotion, and community empowerment assistance (Arfan et al., 2021). Sulistyorini's (2022) research in Lake Nya'deng underscores the significance of multi-stakeholder engagement in improving infrastructure quality and bolstering the sustainability of ecotourism initiatives. Consequently, collaboration among diverse stakeholders is a crucial factor in the administration of ecotourism.

The involvement of local communities is a vital component in the technical administration of ecotourism. Their activities encompass jobs as tour guides, administration of non-timber forest products, and the creation of handicrafts utilizing local materials (Insani et al., 2024; Sumarmi et al., 2022). Utama (2023) identifies that the motivation for community involvement is driven by financial needs, conservation awareness, and idealism towards environmental preservation. This contribution illustrates the community's active participation in forest protection and the promotion of local economic sustainability (Ginting & Triska, 2020; Hartoyo et al., 2021; Siahaya et al., 2021). The community's inadequate technical capacity and restricted access to education are the primary concerns that necessitate intervention (Abdillah et al., 2023; Andarani et al., 2018). Conflicts of interest and inequities in benefit distribution (Sowards, 2021) often arise as impediments. According to Ernawati (2018), community training and capacity-building initiatives are crucial measures to address these challenges while enhancing the community's engagement in ecotourism.

The penta-helix approach offers a comprehensive solution by integrating the roles of academics, government, business, society, and media in ecotourism management. Maulana & Pratama (2021) emphasized that this approach is effective in accelerating the development of ecotourism-based tourist villages. This coordination is evident in diverse operational activities and strategic planning involving numerous stakeholders (Ariyani & Fauzi, 2022; Hakim & Soemarno, 2017; Satyatama et al., 2020). Utama's studies (2023) at several forest-based ecotourism sites indicate that effective coordination can facilitate adaptive and sustainable management, tackling the issues encountered by local communities.

3.2. Elements of Culture, Local Wisdom and Tradition

Cultural elements, local wisdom, and traditions play a central role in the management of community-based forest ecotourism in Indonesia (Farid et al., 2023). Local culture functions as a means for the community's adaptation to the natural environment, embodying ideals of conservation and forest resource management. Zainal et al. (2024) explains that local knowledge passed down through generations serves as an ethical guide in utilizing and protecting the forest. Customary standards, such as Qanun (village regulations in Aceh), govern the sustainable utilization of natural resources and reinforce the community's sense of ownership of the forest as an integral aspect of their cultural identity (Anggraini and Gunawan, 2021). This approach fosters a strong connection between culture and conservation, providing a foundation for sustainable ecotourism management. The connection between local culture and ecotourism management is becoming increasingly apparent through traditions and cultural values that generate a distinctive appeal for tourists. Within the Gayonese community in Aceh, traditions and customary values constitute the fundamental link between the people and the forest, which is essential to their identity (Zainal et al., 2024). This tradition protects the spiritual bond with nature and enhances sustainable forest management. On Buano Island, the Higaro tradition serves as a social mechanism that facilitates the prudent utilization of forest resources by the community (Singgalen, 2020). This mechanism illustrates the adaptability of societal norms to promote practical conservation activities while accommodating governmental policy changes, all without compromising fundamental cultural values. Cultural components, including traditional dwellings, ancestral graves, and customary ceremonies, enhance the tourist experience. The close relationship between tradition, culture, and forest ecosystems forms a rich narrative in community-based ecotourism, positioning tradition as the primary driver of sustainability.

Despite the significance of culture and tradition, ecotourism management based on local wisdom often faces challenges in integrating indigenous knowledge into the modern framework of forest management. Alfitri (2022) identified that the primary limitation is the absence of documenting of local expertise, predominantly retained in the memory of traditional elders. A further difficulty is the insufficient technical capability among indigenous groups to properly manage ecotourism, hindering their ability to compete with contemporary management techniques. An inclusive strategy that engages indigenous people at every phase of development has demonstrated efficacy in bridging this gap. This stage facilitates the intergenerational and cross-sectoral transfer of information, hence enhancing the significance of indigenous knowledge in ecotourism management. The efficacy of local wisdom in forest environmental conservation has been demonstrated in numerous case studies. Purwowibowo (2020) observed that community engagement in mangrove conservation rooted in local understanding in Wringinputih yielded ecological, social, and economic advantages. This method entails the restoration of mangrove forests by the use of traditional knowledge, hence establishing a sustainable conservation framework (Ambarita et al., 2018; Arkwright & Kaomaneng, 2018; Basyuni et al., 2018; Harahab et al., 2018; Mulyadi & Hamidy, 2021; Putri et al., 2023; Rudianto et al., 2021). In the Bur Telege Forest area of Central Aceh, the implementation of customary norms by the local community effectively safeguarded the habitat of endemic avian species and protected species, while simultaneously enhancing the community's economic sustainability through ecotourism (Zainal et al., 2024). The active participation of the local community fosters a sense of ownership over the forest area, establishing a management model that is adaptive and pertinent to local requirements (Anggraini & Gunawan, 2021).

The use of cultural components, local wisdom, and traditions in forest-based ecotourism fosters a strong connection between humans and the environment. Alfitri (2022) asserts that the integration of traditional norms with contemporary management practices can enhance the sustainability of forest ecosystems. In many regions, indigenous societies utilize the forest not simply as a means of sustenance but also as a focal point of spirituality and culture. Tradition-based management, exemplified by practices in Bur Telege, illustrates the adaptation of traditional values to facilitate conservation and simultaneously bolster the local economy (Farid et al., 2023; Zainal et al., 2024). The community's active participation in forest ecotourism management and adherence to local knowledge frequently serves as a crucial element in promoting environmental conservation and sustainable management (Hakim & Soemarno, 2017; Hartoyo et al., 2021; Hidayat et al., 2024; Insani et al., 2024). Local wisdom, which includes customary norms, traditions, and environmental knowledge passed down through generations, helps create forest management practices that align with the ecological and social needs of the local community. In general, the description of the functions, flows, and interconnections of each stakeholder element in forest ecotourism management in Indonesia can be illustrated as follows (Figure 3):

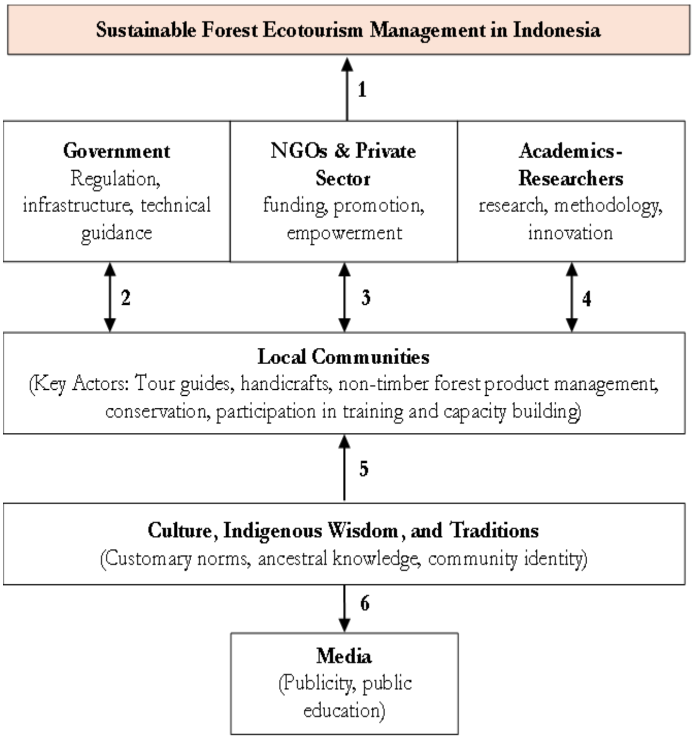

Figure 3. Relationships among stakeholders in forest ecotourism in Indonesia (Description: 1 = Interaction and coordination; 2 = Support, collaboration; 3 = Partnership; 4 = Knowledge, recommendations; 5 = Foundational values and ethics; 6 = Visibility, education, awareness-raising) (Source: Author's analysis based on literature review)

4. Conservation, Biodiversity and Environmental Carrying Capacity

4.1. Conservation and Biodiversity in Ecotourism

Forest-based ecotourism in Indonesia has great potential to support conservation and biodiversity preservation efforts (Abdillah, 2023; Feti et al., 2020; Hakim & Soemarno, 2017; Santosa & Kwatrina, 2024; Siahaya et al., 2021). In this context, conservation includes sustainable management of natural resources that allows for the preservation of ecosystems while also providing economic benefits to local communities. Biodiversity has become one of the main attractions in the development of ecotourism, especially in mangrove ecosystems, tropical forests, and other conservation areas. The educational tourism experience gained from interactions with local flora and fauna can enhance understanding and awareness of the importance of environmental conservation (Afifah et al., 2023; Rudianto et al., 2021).

Mangrove forests are one of the most prominent ecosystems in the development of conservation-based ecotourism. This ecosystem not only supports the sustainability of coastal ecosystems but also serves as an essential habitat for various species (Basyuni et al., 2018; Harahap et al., 2021; Hidayat et al., 2024; Ilhamdi et al., 2021; Pin et al., 2021; Vipriyanti et al., 2024). For example, in the Bandar Bakau area, 17 species of mangroves have been found, which serve as habitats for various fauna, such as birds, reptiles, and crustaceans (Mulyadi & Hamidy, 2021).

In addition, economic benefits can also be obtained through the environmental services provided by the mangrove ecosystem, including increased income for local communities through tourism activities (Hastuti & Yuliati, 2017; Purwowibowo et al., 2020). Biodiversity in mangrove ecosystems, such as the species Rhizophora mucronata and Avicennia marina, plays an essential ecological role (Askar et al., 2021; Prihadi et al., 2024). Functions such as coastal protection and soil fertility enhancement make mangroves a vital element (Ali et al., 2021; Novianti et al., 2022). Fauna species such as crabs and water birds also indicate that this ecosystem is healthy, making it one of the main attractions for nature-based educational tourism (Ginantra et al., 2021; Manullang et al., 2024; Purify et al., 2019). However, threats to the preservation of mangrove ecosystems, such as land conversion and uncontrolled human activities, pose challenges that require serious attention (Hastuti & Yuliati, 2017; Purify et al., 2019; Purwowibowo et al., 2020; Putri et al., 2023).

Besides mangroves, tropical forests are also important locations for the development of biodiversity-based ecotourism. The forests of Gunung Leuser National Park (TNGL), for example, have a very high level of biodiversity, both in terms of flora and fauna. Plant species from the Dipterocarpaceae family, as well as various types of birds and mammals, are the main attractions that support the development of environmentally based tourism (Aryantie et al., 2023; Hartoyo et al., 2021). The interaction of tourists with the environment in this area also provides an opportunity to enhance understanding of the importance of biodiversity conservation (Sisriany & Furuya, 2024).

Conservation-based ecotourism programs often involve local communities as the main actors in the management and maintenance of the area (Ginting & Triska, 2020). In the Wringinputih area, community-engaged mangrove restoration initiatives have effectively enhanced the quality of the local ecosystem. The habitat, abundant in flora and wildlife, has been well restored, concurrently offering economic advantages to the adjacent community through ecotourism initiatives (Afifah et al., 2023; Purwowibowo et al., 2020). This method illustrates the significance of community engagement in the administration of sustainable ecotourism. Nonetheless, it cannot be ignored that negative impacts can arise from poorly managed ecotourism activities (Hitchner et al., 2009). An example is the alteration of natural animal behavior resulting from unregulated contact with tourists. This effect has been seen in Komodo dragons at Komodo National Park, where heightened human engagement has induced alterations in the animal behavior (Anggraini & Gunawan, 2021). This scenario illustrates the necessity of meticulous planning and management to prevent ecotourism activities from harming the ecosystem that underpins its appeal (Ridwan et al., 2022; Sowards & Banerjee, 2021).

Biodiversity is also a primary focus in protected forest areas and national parks that serve as habitats for endemic and charismatic species. The bird of paradise has emerged as a primary attraction for tourists in the Rhepang Muaif forest. This species depends on large trees for perching and sustenance, illustrating the interdependence of flora and fauna diversity in the area (Lahallo et al., 2022). Ecotourism activities centered on birdwatching not only generate economic benefits but also support habitat conservation efforts (Erniwati & Santosa, 2024). The development of ecotourism based on biodiversity shows how conservation areas can be managed to support ecosystem preservation while also providing economic and educational advantages. The interplay of biodiversity, ecological functions, and the involvement of local communities become an essential element in creating sustainable ecotourism and serve as an effective conservation tool.

4.2. Environmental and Ecosystem Carrying Capacity: Insights from Mangrove Ecotourism Cases

4.2.1. Ecotourism Environmental Carrying Capacity

Environmental carrying capacity is a crucial factor in the management of forest-based ecotourism, as the sustainability of the ecosystem relies significantly on its capability to support human activities without inflicting ecological harm (Ariyani & Fauzi, 2022). Hartanti's (2018) research on mangrove tourism areas like Blanakan reveals a physical carrying capacity (PCC) of 77,000 daily visitors, while relative carrying capacity (RCC) and ecological carrying capacity (ECC) values drop sharply to 2,750 and 825 visitors per day, respectively. This drastic decline reflects constraints arising from environmental preservation needs, visitor experience quality, and managerial factors such as site accessibility and operational hours. This highlights the necessity of limiting visitor numbers and the intensity of tourism activities in accordance with the ecosystem's potential to sustain ecological balance (Harahap et al., 2021; Satyatama et al., 2020). Furthermore, inadequate management might elevate the danger of significant ecosystem degradation, as evidenced in certain mangrove areas that have suffered deterioration due to excessive tourism activities (Harahab et al., 2018; Lahallo et al., 2022).

4.2.2. Carrying Capacity and Ecological Suitability of Ecotourism

Mangrove ecosystems have limited carrying capacity, thereby emphasizing the significance of environmental capacity in the advancement of sustainable ecotourism. In many locations, including Kunkun Village, the maximum carrying capacity is limited to 235 individuals per day, but Lubuk Kertang has an even lower capacity of merely 36 individuals per day to maintain ecosystem sustainability (Basyuni et al., 2018; Harahap et al., 2021). The restrictions are affected by several aspects, including environmental quality, biodiversity, and the extent of human disturbance, such as unregulated tourism operations (Ginantra et al., 2021). Nonetheless, areas such as Karangsong, possessing a suitability index of 83.7%, demonstrate that proficient management can augment environmental carrying capacity. Efforts such as mangrove rehabilitation, visitor number control, and ecosystem-based management contribute to optimizing ecotourism benefits without exceeding the environmental carrying capacity, while also preserving the area's biodiversity and ecological functions (Ali et al., 2021; Prihadi et al., 2024). From the perspective of ecological suitability, the mangrove forest ecosystem in Indonesia also has great potential for ecotourism development (Yuwono et al., 2021). Vipriyanti (2024) reports that the ecological suitability index of the mangrove tourism area is 74.36%, signifying that the area is classified as S2 (Very Suitable) for ecotourism development. The primary determinants of appropriateness encompass the thickness and density of mangrove vegetation, alongside ambient physical conditions like soil pH and salinity that are conducive to the proliferation of the mangrove ecosystem (Askar et al., 2021; Wardhani et al., 2022). Nevertheless, areas with lower suitability levels require rehabilitation-based interventions, such as replanting mangroves to increase the thickness and density of vegetation, while also improving the ecosystem's resilience to the pressures of tourism activities (Rahmila & Halim, 2018; Wardhani et al., 2022). Such efforts can also enhance the habitat of water birds, which are the main attraction of ecotourism, thereby supporting ecological balance and the sustainability of tourism activities.

4.2.3. Human Pressure on The Ecosystem

Human pressure on forest ecosystems often arises from tourism activities and land conversion, which can significantly disrupt ecological balance (Abdillah et al., 2023; Rudianto et al., 2021). In mangrove areas, for example, resource exploitation and infrastructure development have caused habitat degradation, where 51.2% of waterbird habitat areas are considered threatened by human disturbances (Purify et al., 2019). This pressure is further increased by the development of ecotourism that does not take into account the environmental carrying capacity, such as in the coastal area of Bangkalan, where a population growth of 0.9% per year contributes to increased pressure on the ecosystem through land conversion into settlements and fishponds (Wardhani et al., 2022). As a result, the quality of the environment, such as biodiversity and the functions of mangrove ecosystems, declines, reducing the carrying capacity for species like water birds and typical mangrove plants (Ginantra et al., 2021; Lahallo et al., 2022). To address this challenge, mitigation strategies based on ecosystem rehabilitation and measured management are needed to balance human needs and environmental sustainability.

4.2.4. Sustainability and Development of Forest-Based Ecotourism

The sustainability of forest-based ecotourism depends significantly on management that effectively integrates conservation and tourism development. The mangrove ecosystem serves as a crucial carbon sink, a shield against erosion, and a significant habitat for biodiversity, rendering it an ecological and economic resource that necessitates sustainable management (Hidayat et al., 2024). Nonetheless, the impact of human activities and inadequate management has led to a substantial decrease in mangrove coverage, exemplified by Bedul, where the area diminished from 1,703.99 hectares in 2020 to 947.46 hectares in 2022 (Sumarmi et al., 2024). This reduction indicates the necessity for management solutions that account for environmental carrying capacity, including mangrove rehabilitation to restore ecosystems and visitor number limitations to preserve a balance between tourism exploitation and environmental sustainability (Ali et al., 2021). This method enables ecotourism to evolve as an economic sector that fosters environmental conservation and mitigates the risk of future ecosystem degradation (Arfan et al., 2021; Munandar et al., 2020).

4.3. Education and Environmental Awareness through Ecotourism

Forest-based ecotourism in Indonesia has become an effective means of raising tourists' environmental awareness by combining recreational activities and education. Mangrove ecotourism sites, such as Wringinputih in East Java, provide guests the chance to participate in conservation efforts, including mangrove planting. This engagement not only provides direct experience about the importance of preserving the mangrove ecosystem but also broadens their understanding of the ecological and economic functions of the area (Mulyadi & Hamidy, 2021; Purwowibowo et al., 2020). Conversely, locations like mangrove ecotourism including reading gardens, such as those in Karangsong, West Java, have effectively heightened tourist engagement, particularly among students, in environmental literacy. This reading garden offers comprehensive information on flora, animals, and conservation initiatives, thereby enhancing tourists' understanding of the significance of environmental sustainability (Sukaesih et al., 2021). The integration of recreational activities and educational components in ecotourism offers fresh perspectives and fosters a profound comprehension of the necessity to preserve the balance of forest ecosystems (Ali et al., 2021; Choi et al., 2020; Rudianto et al., 2021).

Forest-based ecotourism in Indonesia not only raises environmental consciousness but also serves as an effective educational tool for environmental protection. This role is apparent due to its influence on enhancing tourist awareness following engagement in several educational activities provided. Research indicates that tourists engaging in ecotourism activities, such as hiking and agricultural practices, often have a heightened awareness of the significance of environmental conservation (Insani et al., 2024). The integration of recreational and educational activities yields a substantial positive effect, particularly for visitors from environmentally conscious demographics, such as the cohort of European and Asian travelers. Tourists in this group are prepared to endorse ecotourism by providing financial donations for conservation efforts (Choi et al., 2020; Putri et al., 2023). These data demonstrate that ecotourism offers leisure advantages while also fostering active engagement from tourists in environmental conservation initiatives.

Forest-based ecotourism significantly influences various aspects of environmental education, including ecological literacy and local community involvement. Participatory rural appraisal research in villages adjacent to protected forests indicates that the community has heightened its understanding of environmental conservation and has actively engaged in forest protection initiatives. This excitement is evident in the adoption of sustainable practices, including the 3Rs (Reduce, Reuse, Recycle) and compost management, which have been disseminated through educational tourism initiatives (Andarani et al., 2018). These activities not only enhance the community's understanding of the importance of preserving forest ecosystems but also strengthen the role of ecotourism as a cross-generational learning medium that supports environmental sustainability (Notohamijoyo et al., 2020; Sukaesih et al., 2021). While forest-based ecotourism possesses considerable promise for improving environmental education and awareness, the difficulties in maximizing its effectiveness continue to pose a substantial problem. A primary issue is the insufficient understanding among tourists about ecological cleanliness and the inadequate sanitary facilities in many ecotourism areas. For instance, while mangrove tourism can offer an educational experience, the actual realization of tourists' environmental consciousness frequently falls short of expectations. This suggests that a more inventive strategy in ecotourism management is essential to provide a more significant and sustainable educational impact (Arfan et al., 2021; Sumarmi et al., 2022). Forest-based ecotourism also significantly contributes to supporting global conservation efforts, including the implementation of the REDD+ program in Bali. Environmentally conscious tourists contribute to this project, so indirectly enhancing the economic value of protected environments. This situation presents strategic opportunities to employ ecotourism as a global educational instrument, which not only deepens tourists' comprehension of conservation significance but also fortifies collaborative efforts in preserving forest sustainability in Indonesia (Ali et al., 2021; Choi et al., 2020; Mulyadi & Hamidy, 2021).

Overall, forest-based ecotourism in Indonesia plays an essential role in enhancing environmental education and awareness. This is accomplished by a synthesis of direct tourist engagement in conservation efforts, comprehensive environmental education, and collaborative partnerships among managers, local communities, and various stakeholders. This combination renders ecotourism an efficacious method to promote behavioral change at both individual and group levels, hence aiding environmental conservation and ecosystem sustainability (Putri et al., 2023; Sukaesih et al., 2021).

5. Socio-Economic and Tourist Preferences

5.1. The Impact of Forest-Based Ecotourism on the Economy, Society, and Environment

Forest-based ecotourism in Indonesia provides diverse economic contributions (Askar et al., 2021; Ginting & Triska, 2020; Ridwan et al., 2022; Satyatama et al., 2020), both through job creation (Mihardja et al., 2023; Novianti et al., 2022) and increasing local community income (Ambarita et al., 2018; Singgalen, 2020). Activities such as boat rentals, the sale of local products, and tour guide services have become major sources of income in certain areas (Afifah et al., 2023; Sumarmi et al., 2022; Utama et al., 2023). However, this contribution is often limited in certain areas, such as in the Dumai forest tourism, which has a Keynesian multiplier of only 0.02, indicating minimal economic impact on the local community's income (Abdillah, 2023; Feti et al., 2020). On the other hand, in locations such as Berjo Village, the synergy between ecotourism and the agricultural sector shows that community-based management can significantly enhance the local economy (Fibrianto, 2020; Harahap & Effendi, 2020). Challenges such as limited access to business opportunities for the community and investment constraints remain obstacles that need to be addressed to strengthen the economic impact of ecotourism (Andarani et al., 2018; Santosa & Kwatrina, 2024). The development of forest-based ecotourism not only contributes to the economic aspect but also has significant social impacts (Zainal et al., 2024). Empowerment programs such as tour guide training and craft product creation open new job opportunities for local communities, helping them reduce dependence on environmentally damaging activities (Prihadi et al., 2024; Siahaya et al., 2021).

Additionally, ecotourism supports the preservation of local culture through activities such as mangrove batik production, which simultaneously attracts tourists (Aryantie et al., 2023; Hidayat et al., 2024). However, the unequal distribution of social and economic benefits remains a significant issue (Sumarmi et al., 2022). The benefits from this sector are often enjoyed more by external managers than by the local community, highlighting the importance of a more inclusive management approach to ensure social justice (Anggraini & Gunawan, 2021; Hitchner et al., 2009; Sowards and Banerjee, 2021). Moreover, forest-based ecotourism also plays a pivotal role in environmental preservation through various conservation activities involving local communities (Ernawati et al., 2018; Zainal et al., 2024). For example, mangrove ecotourism in Lembung Village not only provides economic benefits but also maintains the sustainability of the mangrove forest ecosystem (Putri et al., 2023; Vipriyanti et al., 2024). This community-involved management not only encourages them to actively protect natural resources but also strengthens awareness of the importance of environmental preservation (Purwowibowo et al., 2020; Setyaningrum et al., 2021). In an effort to enhance this sustainability, the integration of ecolabel schemes has become one of the significant approaches. This scheme provides guidance for ecotourism managers to ensure sustainable environmentally friendly practices and support ecosystem conservation. Experiences from countries like New Zealand and Korea show that ecolabels can strengthen local traditions while maintaining ecosystem balance (Notohamijoyo et al., 2020). In Indonesia, the integration of ecolabels also encourages collaboration between the government, the community, and the private sector in preserving vulnerable forest ecosystems. However, the surge in the number of tourists often brings new challenges to the forest ecosystem (Hartanti et al., 2018). Resource exploitation and environmental degradation due to inadequate infrastructure have become issues that need to be addressed comprehensively (Lahallo et al., 2022; Purwoko et al., 2023). In this context, the implementation of ecolabels not only serves as a management guideline but also as an instrument to maintain ecosystem sustainability amidst the increasing pressure from tourism activities. In general, forest-based ecotourism in Indonesia shows a close relationship between economic, social, and environmental impacts (Ernawati et al., 2018; Ridwan et al., 2022; Zainal et al., 2024). An approach that actively involves the community and the application of sustainability principles, such as the integration of ecolabels, becomes an essential foundation in optimizing the benefits of ecotourism without sacrificing ecosystem preservation (Sisriany & Furuya, 2024).

5.2. Tourist Motivation and Preferences

5.2.1. Motivation and Tourist Attraction

Tourist motivation to visit forest-based ecotourism areas is strongly tied to the uniqueness of their attractions. For instance, the Telogo Warno Telogo Pengilon Nature Tourism Park (TWA TWTP) draws visitors through its striking and distinctive landscapes, which create visually immersive experiencesvisitors (Satyatama et al., 2020). Beyond scenery, interactive programs like beekeeping and honey harvesting at the Aek Nauli Elephant Conservation Camp (ANECC) further elevate the site’s appeal by blending education with recreational value (Ginting & Triska, 2020). Additionally, the mangrove areas’ rich biodiversity, particularly avian species, supports specialized activities such as birdwatching and nature photography, thereby boosting visitor engagement (Rahmila & Halim, 2018). Crucially, the accessibility of these locations transforms forests from mere destinations into holistic spaces that offer both adventure and fulfillment, enriching the overall tourist experience (Munandar et al., 2020).

5.2.2. Tourist Preference and Statisfication

Tourist preferences in forest-based ecotourism are greatly influenced by a combination of adequate facilities and the unique experiences offered by the destination. Most visitors expressed satisfaction with the available infrastructure, although there are still shortcomings in accommodation aspects at some locations, such as seen at Lake Sipinsur, indicating the need for improvements in certain service quality (Purwoko et al., 2023). Tourist preferences are also shaped by the sources of information they access (Trišić, 2024), with family and friends being the dominant sources, especially for visitors traveling in groups, whether for recreational or social purposes (Purwoko et al., 2023). Additionally, their level of satisfaction is also influenced by opportunities to participate in environmental conservation, such as through simple yet impactful practices like reducing the use of single-use plastics. This participation reflects tourists' awareness of environmental sustainability, which is one of the core values of forest-based ecotourism (Basyuni et al., 2018). The integration of facilities, experiences, and active participation makes forest-based ecotourism an attractive and meaningful choice.

5.2.3. Factors Driving Tourist Visit

Tourists are drawn to forest-based ecotourism for diverse objectives, including the pursuit of health, the appreciation of natural beauty, and the enhancement of social connections with family or friends (Choi et al., 2020). Market segmentation reveals clusters of environmentally conscious visitors, including Asian travellers who frequently journey in family units and European tourists who pursue wellness through natural experiences (Choi et al., 2020). Alongside individual motivation, external elements like cross-border advertisements enhance the attractiveness of ecotourism, enabling local places to access a wider worldwide market (Hitchner et al., 2009). The COVID-19 pandemic presented a substantial challenge, resulting in a marked reduction in visitor numbers owing to mobility restrictions and the limitations of tourism locations (Hidayat et al., 2024; Sukaesih et al., 2021). Nonetheless, the trend of tourist visits is beginning to rise due to the relaxation of policies, suggesting the possibility for the revitalization of forest-based ecotourism, bolstered by more strategic promotions and the sustainability of the area's attractions (Notohamijoyo et al., 2020; Yarhamdhani et al., 2024).

5.2.4. Willingness to Pay Ecotourism Services

Tourists' willingness to pay (WTP) for ecotourism services not only signals their commitment to environmental preservation but also quantifies the economic potential of conservation efforts. This dynamic is exemplified by case studies at Cigamea Waterfall and Salak Resort II, which highlight how visitor perceptions of environmental and facility quality shape financial contributions. At Cigamea Waterfall, a survey of 342 respondents revealed that 59.1% of tourists were willing to pay additional fees for area management, reflecting strong conservation awareness (Munandar et al., 2020). In contrast, Salak Resort II demonstrates even greater economic potential: visitors are willing to pay an average of Rp15,000 (exceeding the official entrance fee) indicating substantial revenue opportunities for conservation funding. This disparity between the two sites likely stems from differences in facility quality, accessibility, or attraction uniqueness, underscoring how experiential value directly influences WTP. Together, these cases emphasize the need for destination-specific management strategies that align visitor experiences with conservation objectives while leveraging WTP as a financial mechanism to support sustainable ecotourism development (Munandar et al., 2020).

CONCLUSION

This study hypothesizes that forest-based ecotourism in Indonesia will emerge as a strategic model with all its multiple potentials to achieve three key development goals: economic prosperity, social equity, and environmental sustainability. This study critically assesses the evolution and development prospects of forest-based ecotourism in Indonesia across diverse ecosystem landscapes, including mangrove forests, tropical forests, and forest areas in urban settings.

This study is a comprehensive critical review of existing research that addresses the theme of nature tourism connected to forest ecosystems. The findings of this study, based on an extensive review of the existing literature, reveal that structural challenges, including overlapping policies, inadequate infrastructure, and conflicting stakeholder interests, continue to hinder its development. In addition, unequal distribution of economic benefits and urbanization pressures pose significant threats to its development, especially in fragile ecosystems such as mangroves and protected forests. Despite these challenges, forest-based ecotourism in Indonesia has considerable potential to grow rapidly, due to the natural beauty of the region and the local culture that supports it. The natural beauty inherent in forest-based ecotourism in Indonesia is reflected in the variety of forest-based ecotourism models offered, ranging from forest therapy (ecotherapy) to wildlife monitoring and urban nature tourism, reflecting the high potential for forest-based ecotourism development in Indonesia.

However, the sustainability of these models is still highly dependent on external interventions or approaches that are expected to contribute to maintaining the resilience of the local ecology and culture that surrounds them. Specifically, these interventions are intended to prevent ecological damage due to excessive tourism and cultural erosion due to modifications made to meet tourist expectations. These interventions can be carried out through cross-sectoral policy alignment, increasing conservation literacy, and reducing anthropogenic pressures. With this multisectoral approach, it is hoped that it can encourage the development of forest-based ecotourism in Indonesia to be more sustainable.

Our review of existing studies also highlights that there are three policy strategies recurrently emphasized in scholarly discourse to ensure the sustainability of Indonesia's forest ecotourism. First, literature underscores the critical need for adaptive governance, particularly through streamlining conflicting regulations and enhancing cross-sector coordination between central and regional authorities. Previous research has demonstrated the effectiveness of multi-stakeholder collaboration models (often termed penta-helix partnerships) in integrating scientific data, community knowledge, and policy frameworks for ecosystem-sensitive planning, especially in vulnerable regions like mangrove habitats. Second, scholars widely advocate for strengthened sustainability standards, including mandatory ecolabel certification systems. These should be coupled with incentive mechanisms for communities actively engaged in conservation practices, such as participatory waste management and habitat restoration initiatives, as evidenced by successful case studies across Indonesia. Third, systematic integration of environmental education into ecotourism operations emerges as a consensus recommendation. This includes capacity-building programs for tourism operators and interpretive activities for visitors, which multiple studies correlate with reduced ecological footprints and heightened conservation awareness. Finally, regular monitoring of environmental carrying capacity using geospatial technology, coupled with inclusive community participation in decision-making, is critical to balancing tourism growth with ecosystem regeneration. By integrating these measures, forest ecotourism can foster equitable economic progress while safeguarding Indonesia's biodiversity and cultural heritage.

Limitation of study: The articles reviewed in this study generally focus on specific cases, thus not yet representing the overall reality of forest ecotourism in Indonesia. The lack of field data also limits the depth of analysis, especially in assessing the effectiveness of policies and the potential for conflicts of interest in each region.

Author Contributions: Conceptualization, M.A.L. and N.K.; methodology, M.A.L.; literature search and codification: M.A.L. and N.K.; validation, T.R.Y., B.B.P., A.D.S., D.P., and E.A.; formal analysis, M.A.L., N.K., and T.R.Y.; data curation, M.A.L.; writing - original draft preparation, M.A.L., N.K., T.R.Y.; writing - review and editing, B.B.P., D.P., A.D.S., and E.A.; visualization, M.A.L. B.B.P; supervision, N.K.; project administration, M.A.L. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgments: We gratefully acknowledge the authors whose groundbreaking works laid the foundation for this article.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Abdillah, N. (2023). The sustainable forest tourism management strategies: Case study in Dumai City. *International Journal of Sustainable Development and Planning*, *18*(6), 1649–1658. https://doi.org/10.18280/ijsdp.180601

Abdillah, N., Thamrin, T., Nofrizal, N., & Wijayanto, G. (2023). Quantifying ecological, economic, social, and governance attributes for urban forest eco-tourism using MDS-RAPFISH approach. *International Journal of Sustainable Development and Planning*, *18*(8), 2369–2378. https://doi.org/10.18280/ijsdp.180807

Afifah, R. N., Putri, A., Hartanti, A. N., Negari, S. I. T., Pratama, M. S. R., Zuaini, P. A. K., Al Madani, A. R., Muryanto, B. S., Muhammad, F., Astikasari, L., Indriyani, S., Kurniawati, I., Kusumaningrum, L., Budiharta, S., Flores, A. B., & Setyawan, A. D. (2023). Ecotourism development as a community-based conservation effort in Ayah Mangrove Forest, Kebumen, Central Java, Indonesia. *Asian Journal of Forestry*, *7*(1), 37–44. https://doi.org/10.13057/asianjfor/r070105

Alfitri, A., Alfatih, A., Lionardo, A., Kholek, A., Saraswati, E., Izzudin, M., & Santoso, A. D. (2022). The complexity of integrating indigenous knowledge for ecotourism planning: a case of Mude Ayek's customary forests, Indonesia. *International Journal of Tourism Anthropology*, *9*(1), 76–97. https://doi.org/10.1504/IJTA.2022.128057

Ali, M., Sulistiono, Imran, Z., & Simanjuntak, C. P. H. (2021). The potential development of ecotourism based on mangrove ecosystem in Ujung Pangkah of Gresik Regency, East Java Province, Indonesia. *IOP Conference Series: Earth and Environmental Science*, *800*(1), 012054. https://doi.org/10.1088/1755-1315/800/1/012054

Ambarita, S. T. P., Basyuni, M., Sulistyono, N., Wati, R., Fitri, A., Slamet, B., Balke, T., Bunting, P., & Munir, E. (2018). Landscape planning and economic valuation of mangrove ecotourism using GIS and Google Earth image. *Journal of Theoretical and Applied Information Technology*, *96*(19), 6306–6317.

Andarani, P., Lestari, D. F., Rezagama, A., & Sariffuddin, S. (2018). Sustainable ecotourism development based on participatory rural appraisal: A case study of Thekelan Village, Central Java, Indonesia. *E3S Web of Conferences*, *73*. https://doi.org/10.1051/e3sconf/20187302019

Anggraini, R. I., & Gunawan, B. (2021). Ecotourism development in national parks: A new paradigm of forest management in Indonesia. *E3S Web of Conferences*, *249*, 03010. https://doi.org/10.1051/e3sconf/202124903010

Arfan, A., Nyompa, S., Rakib, M., & Juanda, M. F. (2021). The analysis of mangrove area as a marine eco-fisherytourism area in Luwu Regency South Sulawesi, Indonesia. *Journal of Physics: Conference Series*, *2123*(1), 012009. https://doi.org/10.1088/1742-6596/2123/1/012009

Ariyani, N., & Fauzi, A. (2022). A policy framework for sustainable tourism development based on participatory approaches: A case study in the Kedung Ombo tourism area-Indonesia. *Geojournal of Tourism and Geosites*, *40*(1), 129–135. https://doi.org/10.30892/GTG.40115-811

Arkwright, D., & Kaomaneng, I. S. (2018). Mangrove ecotourism development on Kakaralamo Island North Halmahera: Community perception, participation and development strategies. *IOP Conference Series: Earth and Environmental Science*, *175*(1), 012232. https://doi.org/10.1088/1755-1315/175/1/012232

Aryantie, M. H., Fauzi, R., Saragih, G. S., Junaidi, E., Kayat, & Hidayat, O. (2023). Ecotourism in the city: A strategy to promote sustainability. *IOP Conference Series: Earth and Environmental Science*, *1177*(1), 012006. https://doi.org/10.1088/1755-1315/1177/1/012006

Askar, H., Tahang, H., Sutinah, S., Fakhriyyah, S., Bahar, A., Tresnati, J., & Tuwo, A. (2021). Short communication: Using ecological parameters to assess the sustainability of mangrove ecotourism in Jeneponto, South Sulawesi, Indonesia. *Biodiversitas*, *22*(8), 3571–3577. https://doi.org/10.13057/BIODIV/D220858

Basyuni, M., Bimantara, Y., Siagian, M., Wati, R., Slamet, B., Sulistiyono, N., Nuryawan, A., & Leidonad, R. (2018). Developing community-based mangrove management through eco-tourism in North Sumatra, Indonesia. *IOP Conference Series: Earth and Environmental Science*, *126*(1), 012109. https://doi.org/10.1088/1755-1315/126/1/012109

Choi, G., Kim, J., Sawitri, M. Y., & Lee, S. K. (2020). Ecotourism market segmentation in Bali, Indonesia: Opportunities for implementing REDD+. *Land*, *9*(6), 186.

Ernawati, N. M., Torpan, A., & Voda, M. (2018). Geomedia role for mountain routes development. Mesehe and pisoiu waterfall comparative study. *Geographia Technica*, *13*(1), 41–51. https://doi.org/10.21163/GT_2018.131.05

Ernawati, N. M., Voda, M., Sudhana, I. G. P. F. P., & Sudarmini, N. M. (2018). Forest environment supports for community-based tourism development. *Journal of Environmental Management and Tourism*, *9*(8), 1635–1641. https://doi.org/10.14505/jemt.v9.8(32).01

Erniwati, & Santosa, Y. (2024). High Conservation Value area in oil palm landscape as a potential ecotourism destination for birdwatching activity. *IOP Conference Series: Earth and Environmental Science*, *1366*(1), 012029. https://doi.org/10.1088/1755-1315/1366/1/012029

Farid, A., Arisandi, A., Faridy, A. F., & Priyanto, M. W. (2023). Development of mangrove ecotourism based on the tourist perspective in Lembung Village, Indonesia. *Journal of Environmental Management and Tourism*, *14*(2), 425–434. https://doi.org/10.14505/jemt.v14.2(66).12

Feti, F., Hadi, S. P., Purnaweni, H., & Sudarno. (2020). Does the intervention of regional authorities contribute to sustainable mangrove eotourism? Case Study on Mangrove Management at Karangsong, West Java, Indonesia. *Ecological Questions*, *31*(3), 7–14. https://doi.org/10.12775/EQ.2020.017

Fibrianto, A. S. (2020). Management model of ecotourism-based forest village community land to increase local economic in Karanganyar, Indonesia. *Geojournal of Tourism and Geosites*, *37*(3), 934–942. https://doi.org/10.30892/gtg.37327-729

Ginantra, I. K., Muksin, I. K., & Joni, M. (2021). Crab diversity as support for ecotourism activities in Pejarakan mangrove forest, buleleng, bali, indonesia. *Biodiversitas*, *22*(10), 4139–4145. https://doi.org/10.13057/biodiv/d221003

Ginting, N., & Triska, E. (2020). Developing tourism attractions based on ecotourism in Aek Nauli Indonesia. *IOP Conference Series: Earth and Environmental Science*, *452*(1), 012033. https://doi.org/10.1088/1755-1315/452/1/012033

Hakim, L., & Soemarno, M. (2017). Biodiversity conservation, community development and geotourism development in Bromo-Tengger-Semeru-Arjuno biosphere reserve, East Java. *Geojournal of Tourism and Geosites*, *20*(2), 220–230.

Harahab, N., Riniwati, H., & Abidin, Z. (2018). The vulnerability analysis of mangrove forest status as a tourism area. *Ecology, Environment and Conservation*, *24*(2), 968–975.

Harahap, I., & Effendi, I. (2020). The potential forest ecotourism in Suligi Hill, Riau Province, Indonesia. *Journal of Physics: Conference Series*, *1655*(1), 012148. https://doi.org/10.1088/1742-6596/1655/1/012148

Harahap, Z. A., Sahleni, W., Bakti, D., & Leidonald, R. (2021). Study of development of mangrove forest potential for ecotourism in Kunkun Village, Mandailing Natal Regency, Indonesia. *IOP Conference Series: Earth and Environmental Science*, *912*(1), 012057. https://doi.org/10.1088/1755-1315/912/1/012057

Hartanti, U., Patria, M. P., & Utomo, S. W. (2018). The physical carrying capacity of mangrove ecotourism in Blanakan, Subang Regency, West Java, Indonesia. *E3S Web of Conferences*, *74*. https://doi.org/10.1051/e3sconf/20187402001

Hartoyo, A. P. P., Sunkar, A., Fadillah, A., Hidayati, S., Winata, B., & Hadi, A. N. (2021). Vegetation cover analysis and ecotourism business model for sustainable forest management in Gunung Leuser National Park, Indonesia. *IOP Conference Series: Earth and Environmental Science*, *771*(1), 012001. https://doi.org/10.1088/1755-1315/771/1/012001

Hastuti, T. K., & Yuliati, U. (2017). A model for mangrove forest management based on community empowerment in Bantul regency. *Journal of Environmental Management and Tourism*, *8*(6), 1232–1237. https://doi.org/10.14505/jemt.v8.6(22).10

Hengky, S. H., & Kikvidze, Z. (2018). Tourism sustainability in the Bogor Botanical Gardens, Indonesia. *Urban Forestry and Urban Greening*, *30*, 8–11. https://doi.org/https://doi.org/10.1016/j.ufug.2018.01.007

Hidayat, A., Budiastuti, M. T. S., Trihatmoko, E., Danardono, D., & Ainurrohmah, D. (2024). The potential of community-based ecotourism development with an ecosystem service approach: a case study of Kaliwlingi Village, Brebes, Indonesia. *Environment, Development and Sustainability*, *26*(12), 31099–31119. https://doi.org/10.1007/s10668-023-04380-w

Hitchner, S. L., Apu, F. L., Tarawe, L., Aran, S.G.S.N, & Yesaya, E. (2009). Community-based transboundary ecotourism in the Heart of Borneo: a case study of the Kelabit Highlands of Malaysia and the Kerayan Highlands of Indonesia. *Journal of Ecotourism*, *8*(2), 193–213. https://doi.org/10.1080/14724040802696064

Ilhamdi, M. L., Al Idrus, A., Santoso, D., Hadiprayitno, G., & Syazali, M. (2021). Species richness and conservation priority of dragonflies in the suranadi ecotourism area, Lombok, Indonesia. *Biodiversitas*, *22*(4), 1846–1852. https://doi.org/10.13057/biodiv/d220430

Insani, N., Ridhoi, R., Hidajat, H. G., A'rachman, F. R., Darmendra, I. P. Y., Ardiyanti, R. N., & Veronica, A. (2024). Pro-environmental tourism: Lessons learned from adventure, wellness and eco-tourism in Padusan Village, Mojokerto, East Java. *IOP Conference Series: Earth and Environmental Science*, *1313*(1), 012043. https://doi.org/10.1088/1755-1315/1313/1/012043

Lahallo, W., Tanjung, R. H. R., & Sujarta, P. (2022). Diversity, composition and important tree species for Cenderawasih bird activities in Rhepang Muaif ecotourism forest, Jayapura, Papua, Indonesia. *Biodiversitas*, *23*(2), 741–749. https://doi.org/10.13057/biodiv/d230219

Manullang, H. M., Lubis, Z., & Sabrina, R. (2024). The potential of mangroves in supporting fisheries tourism in Banyak Island, Langkat Regency, Indonesia. *AACL Bioflux*, *17*(4), 1357–1363.

Maulana, F. I., & Pratama, F. C. (2021). Suistainable development planning of tourist village using participatory mapping (Case study: Sanankerto Village, Malang, Indonesia). *IOP Conference Series: Earth and Environmental Science*, *794*(1), 012244. https://doi.org/10.1088/1755-1315/794/1/012244

Mihardja, E. J., Alisjahbana, S., Agustini, P. M., Sari, D. A. P., & Pardede, T. S. (2023). Forest wellness tourism destination branding for supporting disaster mitigation: A case of Batur UNESCO Global Geopark, Bali. *International Journal of Geoheritage and Parks*, *11*(1), 169–181. https://doi.org/https://doi.org/10.1016/j.ijgeop.2023.01.003

Mulyadi, A., & Hamidy, R. (2021). Development of mangrove ecotourism in Bandar Bakau Dumai based on disaster mitigation. *International Journal of Sustainable Development and Planning*, *16*(7), 1359–1367. https://doi.org/10.18280/ijsdp.160716

Munandar, A., Gunawan, A., Nurazizah, G. R., & Kusumoarto, A. (2020). Analysis on willingness to pay at the ecotourism destination, cigamea waterfall, halimun-salak national reserve. *Journal of Environmental Management and Tourism*, *11*(2), 403–416. https://doi.org/10.14505/jemt.11.2(42).19

Notohamijoyo, A., Abdul Hakim, A., Billah, M., & Setya Wiyata, A. (2020). Integration of ecolabelling and ecotourism schemes: Case study of forest honey in Indonesia. *E3S Web of Conferences*, *211*. https://doi.org/10.1051/e3sconf/202021101010

Novianti, R., Afandi, A. Y., Tampubolon, B. I., Rahmadya, A., & Sulawesty, F. (2022). Mangrove resource and ecotourism development in Karangsong, Indramayu Regency, West Java, Indonesia. *IOP Conference Series: Earth and Environmental Science*, *1062*(1), 012039. https://doi.org/10.1088/1755-1315/1062/1/012039

Pin, T. G., Supriatna, J., Takarina, N. D., & Tambunan, R. P. (2021). Mangrove diversity and suitability assessments for ecotourism in cimalaya wetan coast, karawang district, indonesia. *Biodiversitas*, *22*(2), 803–810. https://doi.org/10.13057/biodiv/d220234

Prihadi, D. J., Zhang, G., Lahbar, G. M., & Pasaribu, B. (2024). Integration of community-based tourism (CBT) index and biophysical assessment for sustainable ecotourism mangrove: A case study of Karangsong, Indonesia. *Sustainability*, *16*(7), 2806. https://doi.org/10.3390/su16072806

Purify, A., Nurdin, N., Maulani, R. I., & Lanuru, M. (2019). Water bird habitat suitability analysis in an urban coastal wetland (case study: Lantebung mangrove ecotourism area). *IOP Conference Series: Earth and Environmental Science*, *370*(1), 012042. https://doi.org/10.1088/1755-1315/370/1/012042

Purwoko, A., Zaitunah, A., Samsura, D. A. A., Sibarani, R., Muda, I., & Faustina, C. (2023). Assessing the development potential, feasibility and visitor assessment in the Sipinsur Geosite natural tourism area, Toba Caldera Global Geopark, Indonesia. *Geojournal of Tourism and Geosites*, *49*(3), 1075–1086. https://doi.org/10.30892/gtg.49323-1107

Purwowibowo, Santoso, B., Hendrijanto, K., Hariyono, S., & Nufus, B. H. (2020). Local wisdom for mangrove conservation and ecotourism: Case study from Wringinputih, Muncar, Banyuwangi. *IOP Conference Series: Earth and Environmental Science*, *485*(1), 012092. https://doi.org/10.1088/1755-1315/485/1/012092

Putri, E. P., Putra, B. R. S. P., & Puteri, A. H. A. (2023). Mangrove forest conservation-based tourism industry development in Indonesia. *International Exchange and Innovation Conference on Engineering and Sciences*, *9*, 161–167. https://doi.org/10.5109/7157967

Putri, V., Wijayanti, L. R., & Hidayati, N. I. (2024). Ecotherapy healing forest concept in natural tourism park (NTP) Mount Kelam Sintang Regency West Kalimantan, Indonesia. *International Journal of Geoinformatics*, *20*(1), 53–71. https://doi.org/10.52939/ijg.v20i1.3031

Rahmila, Y. I., & Halim, M. A. R. (2018). Mangrove forest development determined for ecotourism in Mangunharjo Village Semarang. *E3S Web of Conferences*, *73*. https://doi.org/10.1051/e3sconf/20187304010

Ridwan, R., Ma'rifatin, Z., & Rahmawaty, R. (2022). Ethnobotanical study and conservation strategy of medicinal plants in the ecotourism area of Kedah Rainforest Lodges in Aceh, Indonesia. *Biodiversitas Journal of Biological Diversity*, *23*(12), 6227–6237. https://doi.org/10.13057/biodiv/d231218

Rudianto, Dwi Ari Sanda, L., Chairi Vina, R., Putri Olivia, N., Ester, & Nur Habibah, E. (2021). A sustainable ecotourism conservation model based on biodiversity analysis of Tambaan Coast, Pasuruan City, East Java Province. Indonesia. *IOP Conference Series: Earth and Environmental Science*, *718*(1), 012003. https://doi.org/10.1088/1755-1315/718/1/012003

Santosa, Y., & Kwatrina, R. T. (2024). The potential of HCV areas as ecotourism destinations: Preliminary identification in Sumatra oil palm plantation. *IOP Conference Series: Earth and Environmental Science*, *1366*(1), 012031. https://doi.org/10.1088/1755-1315/1366/1/012031

Satyatama, T., Wijayanti Faida, L. R., Purwanto, R. H., & Fandeli, C. (2020). Carving the future of nature ecotourism in Indonesia: Case of Taman wisata alam telogo warno telogo pengilon. *Jurnal Manajemen Hutan Tropika*, *26*(1), 80–89. https://doi.org/10.7226/jtfm.26.1.80

Setiawan, A., Charles, Y. O. B., Rustiati, E. L., Ruciyansah, Y., & Anwar, Z. (2021). An assessment of Sumatran elephant presences (Elephas maximus sumatranus) in Kotaagung Utara (Lampung, Indonesia) as a potential tourism attraction. *Biodiversitas Journal of Biological Diversity*, *22*(12), 5397-5407. https://doi.org/10.13057/biodiv/d221222

Setyaningrum, E. W., Erwanto, Z., Prapti, K. P., Jayanti, A. L., Dewi, A. T. K., & Susanti, H. D. (2021). Development of sustainable mangrove areas based on empowerment of coastal communities in Cemara Beach, Pakis, Banyuwangi, East Java, Indonesia. *IOP Conference Series: Earth and Environmental Science*, *718*(1), 012053. https://doi.org/10.1088/1755-1315/718/1/012053

Siahaya, M. E., Matius, P., Aipassa, M. I., Rayadin, Y., Ruslim, Y., & Aponno, H. S. E. S. (2021). Ecotourism development through biodiversity potential identification and community perception in the protected forest on buano island, western seram, Maluku, Indonesia. *Biodiversitas*, *22*(6), 3179–3191. https://doi.org/10.13057/biodiv/d220621

Singgalen, Y. A. (2020). Mangrove forest utilization for sustainable livelihood through community-based ecotourism in kao village of north halmahera district. *Jurnal Manajemen Hutan Tropika*, *26*(2), 155–168. https://doi.org/10.7226/JTFM.26.2.155

Sisriany, S., & Furuya, K. (2024). Understanding the spatial distribution of ecotourism in Indonesia and its relevance to the protected landscape. *Land*, *13*(3), 370. https://doi.org/10.3390/land13030370

Sjaifuddin, S. (2020). Sustainable management of freshwater swamp forest as an ecotourism destination in Indonesia: A system dynamics modeling. *Entrepreneurship and Sustainability Issues*, *8*(2), 64–85. https://doi.org/10.9770/jesi.2020.8.2(4)

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research, 104*, 333–339. https://doi.org/https://doi.org/10.1016/j.jbusres.2019.07.039

Sowards, S. K., & Banerjee, P. (2021). Ecotourism as leisure and labor in the experience of the "great" Outdoors. *Frontiers in Communication*, *6*. https://doi.org/10.3389/fcomm.2021.736762

Sukaesih, S., Winoto, Y., & Septian, F. I. (2021). Pioneering public space reading park in the Karangsong Mangrove Forest Ecotourism Area, Indramayu Regency, West Java Province, Indonesia. *Library Philosophy and Practice*, *2021*.

Sulistyorini, I. S., Allo, J. K., Edwin, M., & Rosdianto. (2022). Assessment of lake tourism object as ecotourism destination in Merabu, Berau Regency, East Kalimantan. *Jurnal Sylva Lestari*, *10*(1), 155–166. https://doi.org/10.23960/jsl.v10i1.554

Sumarmi, S., Bachri, S., Purwanto, P., Mutia, T., Sholeha, A. W., Rahmasyah, P. I., & Shrestha, R. P. (2024). Mangrove forest management strategy in Bedul, Banyuwangi: Collaboration between community and Alas Purwo National Park for sustainable ecotourism. *GeoJournal of Tourism and Geosites*, *52*(1), 85–97. https://doi.org/10.30892/gtg.52108-1185

Sumarmi, S., Bachri, S., Purwanto, P., Zubaidah, S., Shrestha, R. P., & Sholiha, A. W. (2022). Assessing Bedul Mangrove Ecotourism using green and fair strategy empowerment to fulfill SDGs 2030 agenda for tourism. *Environmental Research, Engineering and Management*, *78*(2), 73–87. https://doi.org/10.5755/j01.erem.78.2.31006

Trišić, M. (2024). Managing digital marketing visibility of ecotourism, sustainable and green tourism. *Tourism International Scientific Conference Vrnjačka Banja-TISC, 8*(1), 258-268. https://doi.org/10.52370/TISC24258MT

Utama, I. G. B. R., Junaedi, I. W. R., & Krismawintari, N. P. D. (2023). The Bali ecotourism destination management to create small local business. *International Journal of Sustainable Development and Planning*, *18*(11), 3439–3447. https://doi.org/10.18280/ijsdp.181109

Vipriyanti, N. U., Semadi, I. G. N. M. D., & Fauzi, A. (2024). Developing mangrove ecotourism in Nusa Penida Sacred Island, Bali, Indonesia. *Environment, Development and Sustainability*, *26*(1), 535–548. https://doi.org/10.1007/s10668-022-02721-9

Wardhani, M. K., Rosyid, D. M., & Armono, H. D. (2022). Land use change of mangrove forest for eco-tourism in the South Coastal, Bangkalan, East Java-Indonesia. *International Journal of GEOMATE*, *23*(98), 136–146. https://doi.org/10.21660/2022.98.1221

Yarhamdhani, Y., Hamdani Harahap, R., Humaizi, H., & Kusmanto, H. (2024). Community-based sustainable ecotourism at Tangkahan Tourism Destination, Langkat Regency. *WSEAS Transactions on Environment and Development, 20*, 203–214. https://doi.org/10.37394/232015.2024.20.21

Yuwono, E., Maulany, R. I., & Barkey, R. A. (2021). Site suitability evaluation for ecotourism development: A case study in Bulue Village, Soppeng District, Indonesia. *Journal of Sustainability Science and Management*, *16*(1), 129–140. https://doi.org/10.46754/jssm.2021.01.012

Zainal, S., Nirzalin, Fakhrurrazi, Yunanda, R., Ilham, I., & Badaruddin. (2024). Actualizing local knowledge for sustainable ecotourism development in a protected forest area: insights from the Gayonese in Aceh Tengah, Indonesia. *Cogent Social Sciences*, *10*(1), 2302212. https://doi.org/10.1080/23311886.2024.2302212

Article history: Received: 26.12.2024 Revised: 28.04.2025 Accepted: 23.05.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1057-1066
DOI 10.30892/gtg.602spl03-1479

PERCEPTION OF KEY STAKEHOLDERS ON SUSTAINABLE TOURISM PRACTICES: THE CASE OF VILLA DE LEYVA, COLOMBIA

Ingrid FONSECA[1*], Camila GALEANO[1], Leidy ROA[1]

[1] National Pedagogical University, Faculty of Physical Education, Bogotá, Colombia; ipfonsecaf@upn.edu.co (I.F.); mcgaleanor@upn.edu.co (C.G.); lmroag@upn.edu.co (L.R.)

Citation: Fonseca, I., Galeano, C., & Roa, L. (2025). Perception of key stakeholders on sustainable tourism practices: The case of Villa de Leyva, Colombia. *Geojournal of Tourism and Geosites*, 60(2spl), 1057–1066. https://doi.org/10.30892/gtg.602spl03-1479

Abstract: Sustainable tourism promotes initiatives that enhance natural and cultural assets while addressing social, environmental, and economic impacts. This study aims to assess the perceptions of residents, public officials, and tourism managers in Villa de Leyva regarding sustainable tourism and their contributions to its development. The town is a recognized colonial heritage site and a certified sustainable tourism destination. However, it faces challenges in balancing tourism growth with sustainable development. The methodology employed a qualitative approach, utilizing a case study design. Hence, data were collected through semi-structured interviews with twelve participants representing four stakeholder groups: farmers, hotel managers, tourism entity leaders, and public sector officials. The results reveal that although Villa de Leyva is certified as a Sustainable Tourism Destination, it lacks an adequate legal framework, which led to the creation of a Public Tourism Policy in the municipality. The study revealed positive aspects include job creation, opportunities for the community, and training tourism programs for businesses and residents. On the other hand, negative aspects include poor waste management, depletion of natural resources, increased insecurity, rising costs, and the displacement of residents. The study emphasizes the importance of inclusive governance models that promote collaboration between the public and private sectors, as well as community participation in planning and implementation processes. Despite Villa de Leyva's certification there is a significant gap that persists between policy formulation and practical application. This research provides valuable insights into how stakeholder perceptions influence sustainable development at the local level. It contributes to the refinement of public policies and informs future studies in heritage tourism and stakeholder engagement.

Keywords: tourism, sustainability, community perceptions, tourism impacts, stakeholders' engagement, community- based tourism, rural tourism, tourism governance.

* * * * * *

INTRODUCTION

Tourism has recently experienced exponential growth, with repercussions at cultural, economic, social, political, and environmental levels (Lőrincz et al., 2020; Olszewski-Strzyżowski, 2022). Tourism activities contribute 10.3% annually to the global Gross Domestic Product (GDP) (Jóźwiak & Sieg, 2021). In this context, Mori et al. (2022) suggest that it contributes to local economic development through job creation and other benefits for residents. Furthermore, progress has been observed in urban and rural areas through improvements in relationships among stakeholders and the implementation of innovative and environmentally responsible practices (Stoiljković et al., 2025). Based on the paragraph above, tourism is defined as the activity through which individuals seek leisure outside of their work environment, causing them to enjoy locations different from their usual place of residence. This can lead to a convergence of cultures, showcasing diverse forms of consumption in the visited area (Więckowski, 2021).

The tourist chooses their destination based on the imaginary they construct, shaped by their preferences and personal characteristics, such as age, gender, and social class. According to Gazzola et al. (2018), contemporary tourists tend to seek less crowded destinations to establish a direct connection with the local population, valuing both tangible and intangible goods while pursuing relaxing experiences that include sustainable practices. Their intention lies in understanding the perspective of those who inhabit the space daily and can share their knowledge (Ortega et al., 2021).

As a result, the tourism industry has experienced progress and economic growth (Sudarmanto et al., 2025). For this reason, it is crucial to innovate to meet visitors' desires, offering more authentic and natural experiences while connecting with local people, such as farmers, artisans, and others. This trend has given rise to an alternative form of tourism, mainly focused on experiences that enable closer interaction with social and cultural realities (Stoiljković et al., 2025).

Sustainable tourism

Sustainable tourism emerged as a response to the historical negative impacts of mass tourism, to protect territories and resources for present and future generations. This approach addresses the needs of both tourists and local communities, integrating supply, demand, the natural environment, and sustainability (Buonincontri et al., 2021; Jóźwiak & Sieg, 2021; Olszewski-Strzyżowski, 2022; Trigo & Silva, 2022). These considerations encompass three key dimensions:

[*] Corresponding author

social, economic, and environmental (Mendoza et al., 2023; Fonseca et al., 2024). Due to the negative environmental impacts of tourism activities, it is essential to mitigate consequences such as pollution, habitat destruction, deforestation, wildfires, climate change, and resource exploitation (Więckowski, 2021). This is achieved through conscious tourism, which promotes the participation and recognition of the local population (Soares et al., 2021).

In this context, the United Nations established the Sustainable Development Goals (SDGs) in 2015. According to Moreira et al. (2022), efforts are currently being made to adopt new tourism practices by integrating entrepreneurs and local communities to promote traditional and natural attractions, in order to achieve a balance. Additionally, there is a focus on involving visitors in ways that align their interests with learning about, respecting, and preserving destinations. One option is eco-hotels, designed to provide environmentally protective experiences (Stoiljković et al., 2025).

In this regard, activities focused on the care of natural territories and communities are proposed (Więckowski, 2021; Mori et al., 2022). Besides that, the aim is to foster human interaction with the environment while safeguarding natural, traditional, and intangible heritage from an ethical perspective that benefits the host community (Buonincontri et al., 2021). In this way, sustainable tourism addresses the challenge of developing environmental, social, and economic strategies to minimize negative impacts (Olszewski-Strzyżowski, 2022).

Community-based tourism

Community-based tourism arises from the need to preserve culture, the environment, and values, aiming to provide visitors with a closer connection to communities and active participation in their activities (Rodríguez-Rodríguez, 2018). In this regard, the proactive involvement of the local population becomes crucial, because this causes people to value and appreciate the local traditional knowledge, and to position nature as the main socioeconomic attraction (Moreira et al., 2022; Mandić et al., 2025). It is essential to implement training processes focused on tourism projects that demonstrate their economic, social, and environmental viability to encourage support from local and national governments (Tolkach & King, 2015; Zeng et al., 2024). According to Harb et al. (2025), promoting autonomous community management could generate economic benefits while enhancing competitiveness within the community.

In relation to the topic of this article, notable examples include Malaysia, where rural tourism has been promoted through the commercialization of local products, thereby strengthening the economy (Goh, 2021). Meanwhile, Mendoza et al. (2023) observe that while rural tourism generates economic benefits in Ecuador, it does not significantly contribute to the development of local communities. In contrast, Soares et al. (2021) report that in Compostela, Spain, the concentration of tourists in cultural heritage areas overwhelms the ecosystem and adversely affects residents.

Lőrincz et al. (2020) propose global strategies to promote sustainable tourism, including business approaches to optimize access to tourist sites in Hungary. In Portugal, tourism drives the economy and creates jobs, recording a 25% increase in recent years and becoming one of the most visited destinations in Europe (Trigo & Silva, 2022). Tourism growth, however, has faced challenges since the 1960s and 1970s, emphasizing the need for stronger management to mitigate its negative impacts (Więckowski, 2021). Mandić et al. (2025) conducted a study in the Metropolitan Area of Split, with the participation of four stakeholders: politicians, public sector entities, cultural and community institutions, and tourism companies. Seidualin et al. (2025) analyzed the role of stakeholders including banks, investment funds, farmers, the local community, and tour operators in contributing to sustainable development in the Ulytau State National Natural Park in central Kazakhstan. They believe that the local community can provide services and traditional cuisine to tourists, while tour operators can organize excursions that immerse visitors in the region's cultural and natural heritage. Harb et al. (2025) examined the effectiveness of sustainable tourism policies in Jordan, a country that holds a significant position in global tourism. In their study, they considered the same stakeholders as in the present study.

The authors highlight one key challenge: Jordan's rapid growth as a tourism center has created environmental, economic, and socio-cultural problems. As future lines of research, they suggest using technology to improve tourism management and implementing policies to achieve a sustainable balance. Stoiljković et al. (2025) analyzed the efficiency of tourism in Europe from a sustainability perspective, focusing on social and economic impacts. They argue that sustainable management can mitigate negative impacts such as overcrowding, waste management problems, and environmental pollution. Pérez (2024) conducted a study in Cuba, a country highly dependent on tourism. The author emphasizes that the formulation of policies to safeguard tourist destinations is a globally relevant issue due to its impact on local communities, the economy, infrastructure, and the environment.

Finally, Sudarmanto et al. (2025) examined tourism development in Kemuning Village, Indonesia, highlighting the importance of incorporating sports activities as a strategy for local growth. Their findings suggest that such initiatives generate social, cultural, and economic benefits and contribute to the responsible management of tourism. In this context, this research holds particular significance, as it was conducted in Villa de Leyva, a municipality recognized as a National Monument of Colombia for over 70 years. Renowned for its historical and colonial heritage, Villa de Leyva highlights the critical need to preserve its customs and values. The aim of the research is to assess how Villa de Leyva residents, public officials and tourism managers perceive sustainable tourism and how they contribute to its development.

MATERIALS AND METHODS

This research adopted a qualitative approach through the case study method with a descriptive scope. Widely used in social science research, this method helps to explore dynamics within real-world contexts. Thus, this research aimed to study situations and understand their development in Villa de Leyva. The case study approach facilitates observing human behavior and collecting data through interviews, offering detailed insights into the surrounding environment. As Carazo

(2006) explains, this method can focus on analyzing individuals or groups within specific locations, such as villages, cities, or countries. Given that tourism is inherently a social phenomenon, using a case study approach is both appropriate and relevant. Initially, the problem was defined, followed by the formulation of a strategy to implement the case study, and finally, the data collection technique was selected. The sample in this study consisted of twelve individuals divided into four stakeholder groups. The methodological process included the following stages: literature review, case selection through purposive sampling, data collection and systematization of the case study (Figure 1).

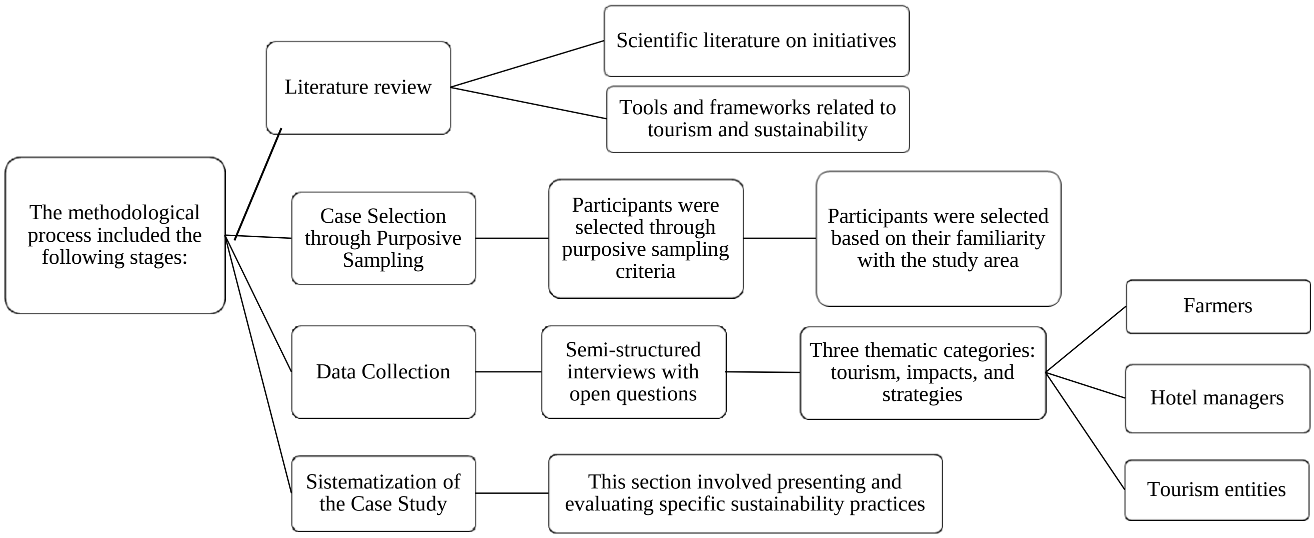

Figure 1. Methodological process

1) Literature review: A comprehensive review of scientific literature on initiatives and tools related to tourism and sustainability.

2) Case selection through purposive sampling: Participants were chosen through purposive sampling based on their familiarity with the area of interest and their expertise derived from life experience, professional trajectory, and prior studies (Cohen et al., 2011). Each participant was thoroughly briefed on the research objectives, participated voluntarily, and provided informed consent. The participants were divided into four stakeholder groups (Figure 2). The first group consisted of three farmers with an average age of 58 years, all either born in Villa de Leyva or residing there for over 20 years, actively engaged in tourism-related activities. The second group included three hotel managers, each with more than 20 years of experience in the tourism sector, operating in the central area or near the Plaza Mayor. The third group comprised three directors of tourism entities, representing both urban and rural businesses such as restaurants and tourism agencies. Lastly, the fourth group included three public sector managers involved in overseeing tourism-related activities.

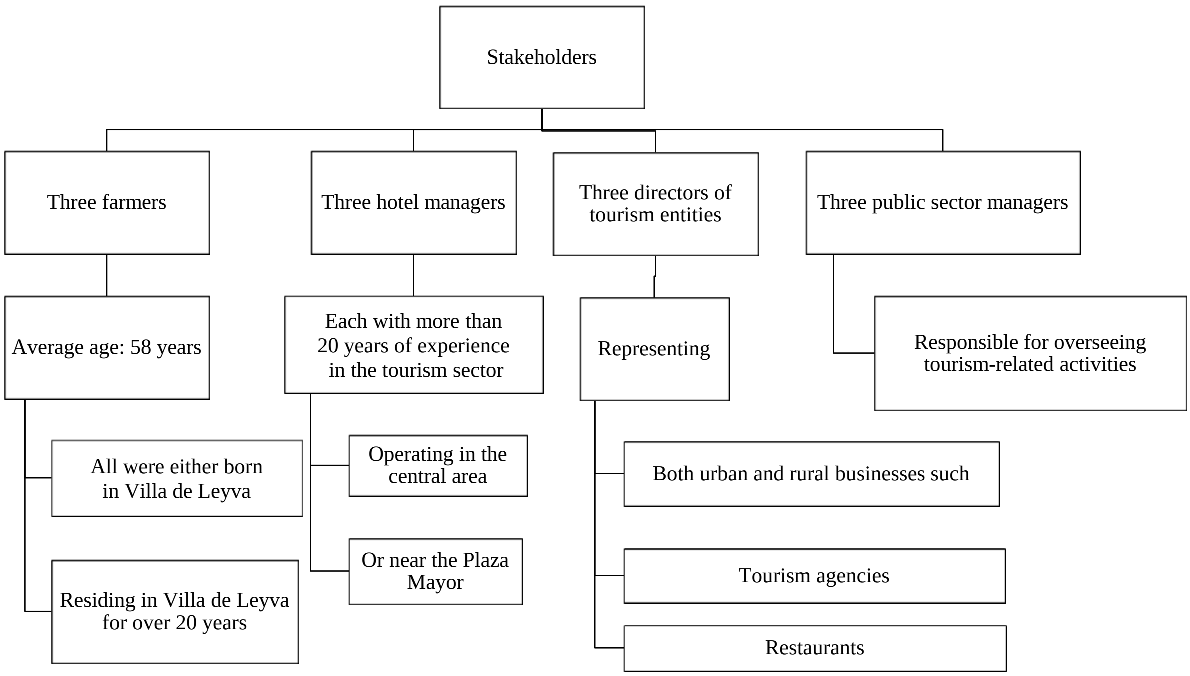

Figure 2. Case selection

3) Data collection: Information was gathered through semi-structured interviews with open-ended questions, allowing in-depth discussions that enhanced the research findings. Conducted in August and September 2023, the interviews focused on three main categories: tourism, impacts, and strategies. Farmers were asked about their perceptions of tourism and sustainability, the positive and negative impacts they had experienced, their involvement in local tourist routes, the municipality’s key attractions, and their awareness of implemented projects. For hotel managers, the questions explored the incorporation of sustainable tourism practices in their operations, their collaboration with other projects, the community’s interest in these practices, and the motivations behind their business strategies. Tourism entities provided insights into their role in promoting local employability, their objectives in Villa de Leyva, and their contributions to cultural preservation. Finally, public sector managers were consulted on the implementation of sustainable initiatives and their strategies in education, environmental protection, and community participation.

4) Systematization of the case study: This section involved presenting and evaluating specific sustainability practices identified for each of the contexts mentioned above.

RESULTS

This section presents the research findings, highlighting how sustainability is being implemented in the tourism sector in Villa de Leyva.

Villa de Leyva’s case

Villa de Leyva, originally named Villa de Nuestra Señora de Santa María de Leyva, was founded in 1572 by Andrés Díaz Venero de Leyva. Located in the Alto Ricaurte region of the Boyacá department in Colombia, it spans an area of 128 km² and has an average temperature of 18.1°C (64.6°F) (Alcaldía de Villa de Leyva, 2020). Villa de Leyva is celebrated for its colonial architecture and was designated as a Colombian architectural heritage site in 1954. In 2017, Villa de Leyva earned recognition as a sustainable tourism destination from the Ministry of Commerce, Industry, and Tourism of Colombia, becoming the eighth destination to receive this prestigious certification under the Colombian Institute of Technical Standards and Certification. This achievement required a strong commitment to responsible tourism, efficient operation of water treatment facilities, and mindful management of public services (Gobernación de Boyacá, 2017). Villa de Leyva is a municipality with natural, cultural, and historical attractions, which provide a significant advantage in attracting many visitors. It hosts approximately 107 tourism service companies, including tour operators and event organizers, making tourism a fundamental activity for the local economy. However, the growing tourism industry has caused environmental degradation caused by both visitors and tourism businesses, highlighting the need to implement processes to protect the municipality’s heritage and environment (Sudarmanto et al., 2025). The Municipal Development Plan 2020-2023 emphasizes the importance of strengthening sustainability and social cohesion, as well as increasing investment in the rural population. Additionally, the plan underscores the necessity of regulating the use of tourist attractions and operators to prevent negative impacts on nature. Despite its tourism potential, the municipality lacks projects that ensure both quality services and preservation efforts, which could negatively affect the community (Alcaldía de Villa de Leyva, 2020). The following section presents an analysis of the interview data collected from the stakeholder groups, focusing on three categories: sustainable tourism in Villa de Leyva, sustainability strategies, and social, environmental, and economic impacts.

Sustainable tourism in Villa de Leyva

Table 1 provides an analysis of the interview data, highlighting key insights. Farmers identify tourism as the primary economic driver for the municipality due to its historical, natural, architectural, colonial, and tranquil attractions, which draw both national and international tourists. While they acknowledge the benefits of employment and economic growth, they also emphasize the need to implement measures to preserve Villa de Leyva’s future.

Table 1. Sustainable tourism in Villa de Leyva

<table>
<tr><th>Category</th><th>Farmers</th><th>Hotels</th><th>Tourism Organizations</th><th>Public Entities</th></tr>
<tr><td rowspan="3">Tourism in Villa de Leyva</td><td>- One of the main economic sources for the municipality</td><td>- Offers hotel and gastronomic services tied to the town’s heritage</td><td>- Provides national and international gastronomic services</td><td>- A public tourism policy is being implemented in Villa de Leyva</td></tr>
<tr><td rowspan="2">- Hosts cultural and historical attractions</td><td rowspan="2">- Local tourism regulations require the training of hotel workers</td><td>- Ensures quality and safety in services</td><td>- Provides training for tourism service providers in best practices</td></tr>
<tr><td>- Offers a variety of tourist options</td><td>- The municipality hosts a variety of festivals</td></tr>
<tr><td rowspan="4">Sustainable Tourism in Villa de Leyva</td><td>- Focuses on conserving and sharing local values</td><td>- Preserves traditional architecture</td><td>- Faces challenges with waste separation and timely collection</td><td>- The municipality holds a sustainability certification</td></tr>
<tr><td rowspan="3">- Seen as a growth opportunity but requires strict control to preserve traditions</td><td>- Incorporates ecological gardens and hires local staff</td><td rowspan="2">- Promotes environmental awareness among clients during tours and activities</td><td>- Promotes the integration of "Tourism-Friendly Schools"</td></tr>
<tr><td>- Includes sites of archaeological interest</td><td rowspan="2">- Conducts cleanup campaigns as part of Colombia Limpia</td></tr>
<tr><td>- Collaborates in events and festivals</td><td></td></tr>
</table>

In the hotel sector, there is a strong commitment to sustainable tourism. Hoteliers demonstrated environmental and social responsibility by constructing facilities thoughtfully, fostering partnerships with the community, and supporting cultural festivals. They also educate guests on local attractions and eco-friendly practices, actively encouraging ecological tourism and the use of locally sourced products. Tourism organizations offer unique experiences in gastronomy, high-quality services, and certified safety, supported by well-trained local staff. However, challenges remain in waste separation within establishments and inadequate waste management. Public entities are actively implementing policies to mitigate negative impacts in line with sustainable tourism certification requirements. They provide training through the Tunja Chamber of Commerce to promote best practices and foster partnerships. Furthermore, they organize cleanup initiatives such as *Colombia Limpia* and encourage the participation of "Colegios Amigos del Turismo" (a group of schools related with tourism-based education).

Sustainability strategies

Table 2 outlines the sustainability strategies and the positive and negative aspects of tourism. Farmers appreciate the increased employment opportunities but emphasize the need to preserve the municipality's infrastructure and environmental wealth. They also propose making their daily activities more visible to visitors and advocating for inter-village collaboration to develop tourist routes that benefit all local communities involved. Hotel managers highlight the importance of raising visitor awareness about resource conservation, alongside ensuring efficient management of public services and fostering community development. Tourism entity leaders prioritize effective waste management strategies, including separation and composting, to reduce environmental impacts. Public entities focus on implementing awareness campaigns and conducting regular inspections to ensure compliance and sustainability within tourism establishments.

Tourism in Villa de Leyva has brought several benefits, including job creation for residents, a diverse range of accommodation options, and a favorable environment for entrepreneurship driven by the town's natural attractions and tranquil ambiance. Additionally, opportunities for training and development aimed at implementing sustainable practices are highlighted, attracting responsible visitors, and fostering a culture of sustainability. In contrast, farmers emphasize the rising cost of living as a significant drawback. They also stress the need for greater attention, advocating for prioritization in training and certifications, as well as improved security in rural areas; Hotels point out a lack of entrepreneurial mindset among residents. While they offer various awareness activities, they cannot ensure that guests follow through on them. Hoteliers also warn about the loss of traditions and the increasing volume of waste in the municipality; and, lastly, public entities identify the influx of foreign visitors as a major challenge, which intensifies insecurity. They also highlight the lack of adequate protection in rural areas, emphasizing the need for stronger intervention from authorities.

Table 2. Sustainability strategies

Category	Farmers	Hotels	Tourism Entities	Public Entities
Sustaina-bility Strategies	- Promotion of job opportunities for young people.	- Notices encouraging conscious use of water and electricity by guests.	- Implementation of a waste separation system.	- Organization of responsible water and energy use campaigns.
	- Commitment to preserving buildings and resources.	- No use of dryers; washed clothes are air-dried using sunlight.	- Significant reduction in the use of public services.	- Conducting inspections of tourist establishments.
	- Interest in showcasing nature, labor, and traditional attractions.	- Offering locally sourced food.	- Utilization of food waste, even when the amount discarded is minimal.	- Reorganization of street vendors.
	- Active participation in inter-village tourism initiatives.	- Implementation and use of solar panels.		- Prohibition of flyer distribution and street vending.
Positive Aspects	- Participation in tourism highlights daily activities such as weaving.	- A broad range of hospitality options is available.	- Accessible to all social strata.	- Variety of tourist plans.
	- Increasing interest among native inhabitants, who train and work in museums, artisan clothing businesses, and some collaboration with the Tourism Department.	- Tourists are drawn by hospitality.	- Presence of tourism entities, such as hotels, agencies, and restaurants.	- Hotels with varying price ranges, among others.
		- Strong commitment to preserving cultural heritage and traditions.		- Abundance of tourist attractions, including museums, galleries, and handicrafts.
		- Implementation of sustainable practices attracts more tourists.		- Proximity to other towns.
Negative Aspects	- Increase in the cost of basic public services.	- No effective measures to raise tourists' awareness of resource use.	- Loss of local traditions due to foreign influence.	- Influx of foreigners has affected the quality of tourist services.
	- Lack of knowledge among farmers about sustainability issues.	- High tourist traffic generates significant waste in Villa de Leyva.	- Tourism impacts the provision of public services.	- Waste proliferation due to the large number of visitors to Villa de Leyva.
	- Obstacles in obtaining safety and quality certifications.	- Lack of specialization in offering typical Villa de Leyva cuisine.		- Tourist activity causes the migration of local residents.
	- Risk of losing traditions.			

Social, environmental, and economic impact

Socially, a significant portion of the local population is compelled to relocate to nearby cities due to rising costs of land and public services. On the other hand, residents knowledgeable about history, politics, and tourism actively engage in tourism projects. They share their knowledge and expertise with visitors, emphasizing the importance of preserving both the environment and the area's rich cultural heritage. Also, opportunities are provided for young people to receive training and participate in tourism-related sectors such as gastronomy, hospitality, and customer service. Hotels are committed to providing high-quality lodging services. They also strive to hire trained staff, including residents and individuals affected by Colombian armed conflict, with skills in customer service. While they express a willingness to support the community, they face challenges due to the lack of regulation regarding the legal framework for the economic activities of farmers. The analysis of tourism entities reveals that most business owners come from outside Villa de Leyva, selecting this location as an ideal setting to establish their ventures. In this context, these entrepreneurs are actively involved in the local community, providing employment, and adopting business practices that address waste collection issues. Additionally, they promote environmental awareness, local history, and participation in ecological walks among tourists. Public entities demonstrate a strong commitment to identifying the social, economic, and environmental impacts of mass tourism in Villa de Leyva. They have observed significant shifts in local labor dynamics, including increased migration and the acceptance of lower wages. Moreover, the growing number of tourists has led to a marked rise in waste generation, affecting both rural and urban areas (Table 3).

Table 3. Social, environmental, and economic impact

Category	Farmers	Hotels	Tourism Entities	Public Entities
Social Impact	- Opportunities for young people are limited.	- Interaction between locals and foreigners.	- Non-local entrepreneurs establish businesses in Villa de Leyva.	- The community is being integrated into training programs.
	- Need to train farmers in tourism.	- Creates job opportunities for individuals affected by armed conflict.		
Economic Impact	- Growth in infrastructure requires specialized labor.	- Hotels must present certifications and accounting records to the state for oversight of their activities.	- Dependence on tourism as the primary economic driver for the municipality.	- Investment in festivals and events.
	- Land costs in Villa de Leyva have increased significantly.		- Job creation for local residents.	
Environ-mental Impact	- Irresponsible use of resources by some tourists.	- Staff commitment to environmental impact training.	- Implementation of natural composting.	- Increase in waste associ-ated with tourist influx.
	- Villa de Leyva has one of the most equipped fire brigades due to frequent fires.	- Information provided on digital platforms for suppliers and clients regarding environmental measures.	- Protocols to raise environmental awareness among clients.	- Campaigns promoting responsible water and energy use.
		- Difficulty in waste separation.		

DISCUSSION

The aim of this research was to analyze the perceptions of residents, public officials, and tourism managers in Villa de Leyva regarding sustainable tourism and their interest in its development. The findings highlight the need for change. Accordingly, Olszewski-Strzyżowski (2022) emphasizes the necessity of transforming current dynamics. Responsible tourism poses a challenge that requires the commitment of tourists, the community, and service providers, all of whom must adhere to existing regulations. Furthermore, it is essential to implement concrete actions across all ventures and tourism events to effectively contribute to sustainable development (Alcaldía de Villa de Leyva, 2020).

Sustainable tourism in Villa de Leyva

The findings highlight the benefits derived from tourism activities. In this context, Lee & Jan (2019) point out that in Taiwan, tourism is perceived as an effective strategy to combat poverty by generating employment and creating diverse job opportunities to meet visitors' needs. Likewise, Olszewski-Strzyżowski (2022) emphasizes the importance of customer service, recreation, and transportation. Like Villa de Leyva, countries such as Austria, Norway, and Guatemala maintain strong ties to their colonial and cultural heritage while offering visitors tranquil settings. According to Moreira et al. (2022), rural areas provide opportunities for reflection and connection with nature, where climate, culture, and gastronomy play pivotal roles. Consequently, hotels in Villa de Leyva and the surrounding are actively working to preserve Boyacá's cultural traditions. The results indicate a strong interest in implementing actions to promote sustainable tourism. In this regard, Dolnicar & Greene (2025) conclude that achieving sustainability requires changes from all stakeholders.

However, respondents highlight the need for increased engagement from public organizations, a concern echoed by Gkoumas (2019) in his study of Rhodes, Greece. He emphasizes that successful tourism innovation requires well-prepared governmental institutions, policies, laws, and local actors. Similarly, Ortega et al. (2021) observe that in the Eco Museum of Puerto López, sustainability is driven by collaboration among public representatives, educators, and locals. In Villa de Leyva, public entities are working to develop training programs and initiatives aimed at regulating sustainable practices among tourism operators, residents, and visitors. Villa de Leyva faces significant challenges due to the absence of an efficient system for collecting and sorting waste in both urban and rural areas. Sancho (2005) warns that improper waste management, compounded by increased tourist activity, poses a serious environmental threat. In contrast, Suluo et al. (2023) illustrate how tourism ventures in Tanzania have successfully addressed this issue through organizations dedicated to processing and managing tourism-generated waste. This highlights the potential for similar strategies to be implemented in Villa de Leyva. Public services have become more expensive due to the mass influx of tourists, mirroring the challenges described by Tinoco (2003) regarding irresponsible management in Peru. This issue directly impacts both residents and tourists, as the increased demand for essential services, such as potable water supply, leads to higher costs and deteriorating availability. Burbano et al. (2022) observe a similar trend in Puerto Ayora, Santa Cruz Island, Ecuador. To address this challenge, it is crucial to implement measures that safeguard public services, recognizing them as a fundamental right.

The population of Villa de Leyva faces growing security challenges stemming from the surge in tourist arrivals. Marchan et al. (2023) highlight that in Peru, insecurity has persisted over the past five years, impacting major tourist destinations due to terrorism. Comparably, Lee & Jan (2019) report that in Taiwan, residents have observed increased crime rates linked to tourism. As a result, authorities are encouraged to implement robust security measures, as these challenges have profound social and economic consequences, with rural areas in Villa de Leyva being among the most vulnerable.

Sustainability strategies

Protecting cultural and environmental heritage in Villa de Leyva is crucial for fostering responsible and economically sustainable tourism, a perspective supported by Del Valle (2017) in Venezuela, and Muresan et al. (2016) in Romania. Both studies highlight the critical role of safeguarding tangible and intangible assets in achieving sustainable tourism development. In Taiwan, efforts go beyond conservation by educating tourists on environmentally responsible behaviors (Lee & Jan, 2019). Preserving these resources ensures the long-term viability of tourist attractions and their ability to draw visitors. Conversely, neglecting such efforts can lead to economic decline. Baloch et al. (2023) underscore the importance of prioritizing environmental considerations over commercial gains in their study of Pakistan.

Given these insights, Villa de Leyva must implement targeted measures that balance tourism-driven commerce with the mitigation of consumption and pollution impacts in local establishments—a challenge that requires urgent attention.

An effective strategy to mitigate the negative impacts of tourism is waste separation for composting, which can be used as natural fertilizer. Hamón (2008) highlights similar initiatives in Monserrate, including ecological points along pathways and cleanup campaigns organized with local merchants. In Tanzania, tourism businesses prioritize proper waste sorting as a step toward fostering corporate sustainability (Suluo et al., 2023). Similarly, in the Galápagos Islands, improving waste collection systems is proposed as a way to protect ecosystems (Burbano et al., 2022). Implementing such measures in Villa de Leyva, such as installing visible trash bins and ecological points in tourist establishments, is essential to reduce environmental impact and promote sustainable practices. The creation of the Public Tourism Policy in Villa de Leyva is an initiative that requires the participation of tourism entities and the local community for its effective implementation. This approach aligns with Gazzola et al. (2018), who, in their study of the cycling tourism model in Italy, highlight the critical role of public-private partnerships. To achieve sustainable and fair outcomes, it is crucial to involve residents in tourism planning and decision-making, fostering inclusive and equitable growth. Mandić et al. (2025) emphasize the need to promote partnerships between the public and private sectors, as well as the importance of implementing context-specific policies and tourism models that promote cultural preservation and the development of local communities.

Residents and farmers have actively contributed to the tourism sector by sharing traditional activities such as milking, harvesting, and weaving. Mwesiumo et al. (2022) illustrate how integrating sustainable innovation processes, as seen in Traena, Norway, can attract more visitors. Following the COVID-19 crisis, Polukhina et al. (2021), Pérez (2024), et al. (2025) and Harb et al. (2025) observe that tourists have shown a growing interest in engaging with nature and local communities. Building on these examples, the farmers of Villa de Leyva have an opportunity to safeguard and share their cultural heritage. By aligning with specific Sustainable Development Goals (SDGs), they can showcase the region’s natural and urban landscapes to both domestic and international visitors, fostering intercultural dialogue and raising awareness about the unique value of the area. A significant positive impact of tourism in Villa de Leyva is the creation of job opportunities for residents. These positions not only enhance the quality of life for the community but also align with the global trend identified by Manzoor (2019) and Stoiljković et al. (2025), which underscores tourism as a key driver of employment and economic growth. In Tanzania, Suluo et al. (2023) highlight the obligation of tourism companies to involve rural communities in their workforce to improve economic conditions. Similarly, Lee & Jan (2019) emphasize the necessity for tourism businesses in Taiwan to prioritize hiring residents. In the city of Jiulong, China, Zeng et al. (2024) concluded that tourism companies that collaborate with local communities create a long-term positive impact, reduce barriers, and minimize conflicts. In this sense, they build relationships based on trust, equality, and cooperation.

In Villa de Leyva, tourism entities actively contribute to local development by integrating residents into their operations. This approach aligns with the United Nations' eight Sustainable Development Goal (SDGs), which promotes “decent work and economic growth” as a cornerstone of sustainable development (United Nations, 2023).

The migration of residents from Villa de Leyva to other municipalities due to tourism has a significant negative impact. This trend contrasts with Sancho’s (2005) findings, which suggest that sustainable tourism has the potential to reduce youth displacement by fostering economic stability within their communities. In Russia, by comparison, residents have adapted to a shifting economic landscape and successfully learned to coexist with visitors (Polukhina et al., 2021). For Villa de Leyva, the rising cost of living in recent years has posed a substantial challenge, making it increasingly difficult for locals to remain in the area. The lack of infrastructure for people with disabilities is a significant issue in Villa de Leyva. This challenge, however, is not confined to the Boyacá municipality; it is a widespread problem in many regions. For instance, in Chile, particularly in the wine tourism sector, addressing accessibility has become a critical priority, as emphasized by Figueroa & Rotarou (2018).

Recognizing and tackling these gaps in infrastructure is essential to ensure that tourism is inclusive and accessible to all. Another variable to consider is the proliferation of tourism ventures, where the majority of owners are either foreigners or individuals from other regions of Colombia. While this trend brings socio-economic benefits to the community, it also raises concerns about the potential erosion of cultural identity. Baloch et al. (2023) observe that such circumstances may lead locals to adopt the customs of visitors and non-local owners, undermining their authenticity. Similarly, Sancho (2005) argues that this dynamic can be harmful, as the host population often assumes roles primarily as employees.

Social, environmental, and economic impact of tourism

Regarding the social impact, Villa de Leyva has achieved the Sustainable Tourism Certification; however, its implementation remains incomplete. Gazzola et al. (2018) highlight that all stakeholders can play a pivotal role in fostering long-term projects, such as cycling tourism, by contributing innovative ideas. In this context, the interviewed stakeholder groups expressed a strong commitment to advancing sustainability in the region through their daily activities, professional efforts, environmental initiatives, and cultural contributions. In Villa de Leyva, interviews reveal that the local population benefits significantly from diverse employment opportunities. According to Birendra et al. (2021), such trends motivate youth and residents to pursue training and careers in the tourism sector, fostering the creation of additional jobs. Notably, Villa de Leyva stands out for its inclusive hiring practices, which prioritize individuals affected by Colombia's armed conflict.

Once again, it is emphasized that tourism has negatively impacted on farmers in Villa de Leyva, leading to the sale of their land and the displacement of residents due to the unsustainability of staying in the region. This phenomenon resembles the situation in Santiago de Compostela, Spain, where, as noted by Soares et al. (2021), local inhabitants have been displaced due to gentrification—a socio-economic process that, over time, harms the original culture. Cuadra (2017) reinforces this concern, highlighting that rising costs and the importation of goods and services from other regions further exacerbate the issue. In response to this problem, the interviewed stakeholders emphasize the need for action to support the community's socio-economic well-being. They propose the implementation of policies that address the needs of both local residents and tourists, aiming to prevent displacement and ensure visitors can experience the authentic culture of the region.

To continue with the economic impact, hotels express a willingness to support local farmers; however, regulatory barriers imposed by government entities prevent them from purchasing their products. Farmers are discouraged by the challenges of formalizing their operations, which require compliance with various legal requirements, such as worker insurance (ARL) and complete documentation—processes that demand both time and financial investment. Hotels, meanwhile, do not take responsibility for sourcing these products or encouraging farmers to align with sector regulations.

Sancho (2005) highlights that failing to purchase local products results in higher costs for tourism businesses and economic difficulties for residents who produce food and goods. Similarly, Suluo et al. (2023) illustrate that in Tanzania, sourcing locally grown food enhances sustainability and productivity, benefiting both suppliers and buyers. In Indonesia, Purnomo (2021), and in Nepal, Birendra et al. (2021), emphasize the importance of economic plans that prioritize the local community—especially farmers—by enabling them to market their goods and play a vital role in tourism development. To address these issues, it is crucial to implement strategies that empower farmers to establish legally compliant and prosperous businesses. In terms of environmental impact, tourism businesses and public entities collaborate with Corpoboyacá to organize awareness talks and events focused on environmental care. This demonstrates effective management in environmental protection, particularly on farms, and highlights active participation in training sessions and cleanup campaigns. However, it is essential to foster greater awareness among residents (Del Valle, 2017).

In Taiwan, both the government and NGOs actively promote environmental education programs for residents and tourists, aiming to enhance nationwide ecological awareness (Lee & Jan, 2019). Similarly, in Pakistan, initiatives such as tree planting events and infrastructure improvements help mitigate the environmental damage caused by tourism (Baloch et al., 2023). By contrast, Suluo et al. (2023) observe that the community in Tanzania lacks a comprehensive understanding of the negative impacts of irresponsible practices, although government campaigns are working to address this gap. Meanwhile, in Rhodes, Greece, Gkoumas (2019) notes that while entities recognize the value of sustainable tourism, they often favor mass tourism due to its equivalent economic returns and reduced effort. Another significant environmental challenge in Villa de Leyva is the occurrence of forest fires, often triggered by pollution from discarded glass and plastic, improper campfire practices, and cigarette waste. These issues are aggravated by the region's prolonged summers, which accelerate the spread of flames, deplete natural resources, and increase water consumption. Similarly, in Chile, prolonged droughts—intensified by mining activities—have caused significant losses in wine production (Figueroa & Rotarou, 2018).

In response to the risk of fires, Villa de Leyva is supported by one of the largest firefighting teams in Boyacá. However, their efforts are hindered by water shortages and persistent droughts. Furthermore, the influx of tourists during festivals disrupts local flora and fauna, forcing animals like deer to flee or hide from their natural habitats. This demonstrates how tourism influx poses a threat to biodiversity by encroaching on ecosystems (Baloch et al., 2023; Suluo et al., 2023).

A management system is being introduced within tourism entities to oversee public services and foster tourism awareness, establishing standards that prioritize sustainable quality over carrying capacity and large-scale events. This initiative reflects progress in enhancing public service conditions, aligning with usage regulations observed in Romania (Muresan et al., 2016). Nevertheless, ongoing monitoring and effective governance remain essential. In contrast, the Galápagos Islands grapple with significant challenges stemming from political disputes over the adequate provision of essential services, adversely affecting both residents and tourists (Burbano et al., 2022). To address these issues, minimizing resource waste is critical to ensuring mutual benefits for the local community and visitors alike (Dolnicar & Greene, 2025).

CONCLUSION

Villa de Leyva boasts a variety of tangible and intangible attractions, making it a compelling destination for tourists. While it is recognized for its tourism potential and valuable heritage, it is essential to implement actions that align with its Sustainable Tourism Certification. Several issues remain unaddressed, including waste management, the overuse of natural and public resources, rising insecurity, increasing costs in the municipality, and the displacement of local residents, who also require greater support and guarantees. Additionally, improving infrastructure accessibility, particularly for people with disabilities, and managing the influx of mass tourism are critical steps to ensure sustainable development and preserve the region's appeal. Among the positive aspects, tourism has contributed to job creation and provided valuable opportunities for the community, supported by training programs aimed at enhancing the skills of both businesses and residents. Efforts to preserve natural resources and public services, such as the use of signage and the involvement of trained personnel, are particularly noteworthy. Cooperatives like Corpoboyacá play a key role in maintaining environmental cleanliness through organized campaigns. However, farmers, while acknowledging the economic benefits of tourism, also highlight the significant rise in living costs within the municipality, which has made it increasingly unaffordable. This financial strain has prompted many to migrate. Hotels have shown a strong commitment, positioning themselves as the most engaged stakeholders in Villa de Leyva. Their strategies include hiring local staff, preserving colonial architecture, and actively supporting cultural events. Moreover, they demonstrate diligence by participating in tourism projects and complying with technical standards specific to the tourism sector. Tourism entities demonstrate a strong commitment to advancing sustainability but face external challenges, particularly in waste management. They stress the importance of unified collaboration among authorities, public policies, local communities, and tourism stakeholders to establish effective strategies. This coordination is especially critical for mitigating adverse effects during events that draw large numbers of visitors to Villa de Leyva. Addressing the social, environmental, and economic consequences of mass tourism - such as heightened pollution levels and natural resource degradation - requires targeted actions and sustainable practices.

Author Contributions: Conceptualization, I.F. and C.G.; methodology, L.R. and C.G.; software, I.F. and C.G.; validation, I.F.; formal analysis, I.F. and C.G. and R.L.; investigation, L.R. and I.F. and C.G.; data curation, I.F.; writing - original draft preparation, I.F. and C.G.; writing - review and editing, I.F. and C.G. and L.R.; visualization, I.F. and C.G.; supervision, I.F.; project administration, C.G. and L.R. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgments: The authors would like to thank the Bachelor's Degree in Recreation program at UPN.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Alcaldía de Villa de Leyva. (2020). *Plan de Desarrollo Municipal para la vigencia 2020-2023 "Villa de Leyva somos todos" [Municipal Development Plan for the period 2020-2023 "Villa de Leyva is all of us"].* https://www.villadeleyva-boyaca.gov.co/Transparencia/PlaneacionGestionyControl/Plan%20de%20Desarrollo%20Municipal%20Villa%20de%20Leyva%20Somos%20Todos%202020%20-%202023.pdf

Baloch, B., Shah, N., Iqbal, N., Sheeraz, M., Asadullah, M., Mahar, S., & Khan, U. (2023). Impact of tourism development upon environmental sustainability: A suggested framework for sustainable ecotourism. *Environmental Science and Pollution Research*, 30(3), 5917-5930. https://doi.org/10.1007/s11356-022-22496-w

Birendra, C., Dhungana, A., & Dangi, B. (2021). Tourism and the sustainable development goals: Stakeholders' perspectives from Nepal. *Tourism Management Perspectives*, 38, 100822. https://doi.org/10.1016/j.tmp.2021.100822

Buonincontri, P., Micera, R., Murillo-Romero, M., & Pianese, T. (2021). Where does sustainability stand in underground tourism? A literature review. *Sustainability*, 13(22), 12745. https://doi.org/10.3390/su132212745

Burbano, V., Valdivieso, C., Izurieta, C., Meredith, C., & Ferri, Q. (2022). "Rethink and reset" tourism in the Galapagos Islands: Stakeholders' views on the sustainability of tourism development. *Annals of Tourism Research Empirical Insights*, 3(2), 100057. https://doi.org/10.1016/j.annale.2022.100057

Carazo, M. (2006). El método de estudio de caso: estrategia metodológica de la investigación científica. [The case study method: a methodological strategy for scientific research]. *Pensamiento & Gestión* (20), 165-193 (in Spanish) htt://www.redalyc.org/articulo.oa?id=6460200ps

Cohen, L., Manion, L., & Morrison, K. (2011). Research methods in education. Routledge. https://doi.org/10.4324/9780203720967

Cuadra, M. (2017). Los impactos económicos del turismo: el caso del turismo fronterizo [The economic impacts of tourism: the case of border tourism]. *Gran tour, revista de investigaciones turísticas* (16), 63-77 (in Spanish), https://eutm.es/grantour/index.php/grantour/article/view/7

Del Valle, S. (2017). La planificación y prevención de los impactos ambientales del turismo como herramienta para el desarrollo sostenible: Caso de estudio Timotes, Venezuela [Planning and prevention of environmental impacts of tourism as a tool for sustainable development: Case study Timotes, Venezuela]. *Revista interamericana de ambiente y turismo* 13(2), 164-183 (in Spanish), http://dx.doi.org/10.4067/S0718-235X2017000200164

Dolnicar, S., & Greene, D. (2025). Research for environmentally sustainable tourism–All talk, no action?. *Journal of Hospitality and Tourism Management*, 62, 28-33. https://doi.org/10.1016/j.jhtm.2024.12.002

Figueroa, E., & Rotarou, S. (2018). Challenges and opportunities for the sustainable development of the wine tourism sector in Chile. *Journal of Wine Research*, 29(4), 243-264. https://doi.org/10.1080/09571264.2018.1532880

Fonseca, I., Bernate, J., & Cabanzo, C. (2024). Medición de la Responsabilidad Social Corporativa en organizaciones deportivas: desarrollo y validación de escala, estudio piloto [Measuring Corporate Social Responsibility in sports organizations: scale development and validation, pilot study]. *Retos*, 53, 58–68 (in Spanish), https://doi.org/10.47197/retos.v53.101720

Gazzola, P., Pavione, E., Grechi, D., & Ossola, P. (2018). Cycle tourism as a driver for the sustainable development of little-known or remote territories: The experience of the Apennine regions of Northern Italy. *Sustainability*, 10 (6), 1863. https://doi.org/10.3390/su10061863

Gkoumas, A. (2019). Evaluating a standard for sustainable tourism through the lenses of local industry. *Heliyon*, 5(11). https://doi.org/10.1016/j.heliyon.2019.e02707

Gobernación de Boyacá (2017). Villa de Leyva, uno de los mejores destinos turísticos sostenibles del país. [Villa de Leyva, one of the best sustainable tourist destinations in the country] Recuperado el 7 de octubre de 2023, https://www.boyaca.gov.co/villa-de-leyva-uno-de-los-mejores-destinos-turisticos-sostenibles-del-pais/

Goh, C. (2021). Strategies for post-Covid-19 prospects of Sabah's tourist market–Reactions to shocks caused by pandemic or reflection for sustainable tourism?. *Research in Globalization*, 3, 100056. https://doi.org/10.1016/j.resglo.2021.100056

Hamón, A. (2008). Cómo llevar a cabo un turismo sostenible en Monserrate? [How to implement sustainable tourism in Monserrate?] *Turismo y Sociedad*, 9, 135–155 (in Spanish), Recuperado de https://revistas.uexternado.edu.co/index.php/tursoc/article/view/434

Harb, A., Alhammad, F. A., Almajali, T. A., Freewan, A., Shkokani, H. M. K., & Slehat, M. (2025). Promoting Tourism Sustainability in Jordan: Policy Effectiveness and Stakeholders Perspectives. *Contemporary Review of the Middle East*, 0(0). https://doi.org/10.1177/23477989251319625

Jóźwiak, M., & Sieg, P. (2021). Tourism development in post-industrial facilities as a regional business model. *Sustainability*, 13(4), 2028. https://doi.org/10.3390/su13042028

Lee, H., & Jan, H. (2019). Can community-based tourism contribute to sustainable development? Evidence from residents' perceptions of the sustainability. *Tourism Management*, 70, 368-380. https://doi.org/10.1016/j.tourman.2018.09.003

Lőrincz, K., Banász, Z., & Csapó, J. (2020). Customer involvement in sustainable tourism planning at Lake Balaton, Hungary—Analysis of the consumer preferences of the active cycling tourists. *Sustainability*, 12(12), 5174.https://doi.org/10.3390/su12125174

Mandić, A., Petrić, L., & Pivčević, S. (2025). Harmonizing sustainability and resilience in post-crisis cultural tourism: Stakeholder insights from the split metropolitan area living lab. *Tourism Management Perspectives*, 55, 101331. https://doi.org/10.1016/j.tmp.2024.101331

Manzoor, F., Wei, L., Asif, M., Haq, M. Z. U., & Rehman, H. U. (2019). The contribution of sustainable tourism to economic growth and employment in Pakistan. *International journal of environmental research and public health*, 16(19), 3785. https://doi.org/10.3390/ijerph16193785

Marchan, C., Moscoso, K., & Vásquez, M. (2023). Estudio de la calidad de los servicios turísticos y seguridad turística en Huanta, Perú [Study of the quality of tourist services and tourist safety in Huanta, Peru], *Revista Universidad y Sociedad*, 15(1),163-175 (in Spanish), Recuperado en 18 de julio de 2024. http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S2218-36202023000100017&lng=es&tlng=es

Mendoza, M., Viteri, V., Vera, V., & Vega, R. (2023). Estrategias para la Gestión Sostenible del Turismo en la Ruta del Manglar, Ecuador [Strategies for Sustainable Management of Tourism in the Mangrove Route, Ecuador], 593 *Digital Publisher CEIT*, 8(1), 188-202 (in Spanish), https://doi.org/10.33386/593dp.2023.1.1390

Moreira, J., Bravo, L., & Macías, N. (2022). Realidades del turismo comunitario en Manabí–Ecuador. [Realities of community tourism in Manabí, Ecuador.], *RECUS: Revista Electrónica Cooperación Universidad Sociedad*, 7(1), 45-57 (in Spanish). https://doi.org/10.33936/recus.v7i1.4211

Mori, M., Ramírez Pepe, O. M., García Rivas Plata, C. E., & Ishuiza Tapullima, R. (2022). Turismo sostenible teniendo como base la evaluación de geositios [Sustainable tourism based on geosite assessment]. *Revista Universidad y Sociedad*, 14(3), 202-216 (in Spanish), https://rus.ucf.edu.cu/index.php/rus/article/view/2858

Muresan, I., Oroian, C., Harun, R., Arion, F., Porutiu, A., Chiciudean, G., & Lile, R. (2016). Local residents' attitude toward sustainable rural tourism development. *Sustainability*, 8(1), 100. https://doi.org/10.3390/su8010100

Mwesiumo, D., Halfdanarson, J., & Shlopak, M. (2022). Navigating the early stages of a large sustainability-oriented rural tourism development project: Lessons from Træna, Norway. *Tourism Management*, 89, 104456. https://doi.org/10.1016/j.tourman.2021.104456

Olszewski-Strzyżowski, D. (2022). Promotional activities of selected National Tourism Organizations (NTOs) in the light of sustainable tourism (including sustainable transport). *Sustainability*, 14(5), 2561. https://doi.org/10.3390/su14052561

Ortega, R., Delgado, E., & Sánchez, J. (2021). Evolución del turismo cultural: Estudio de caso para el desarrollo de un ecomuseo en la provincia de Manabí, Ecuador [Evolution of cultural tourism: Case study for the development of an ecomuseum in the province of Manabí, Ecuador], *Historia Actual Online* (54), 143-156 (in Spanish), https://doi.org/10.36132/hao.vi54.2034

Pérez, V. E. (2024). Assessment of the sustainability of Cuban nature-based tourism destinations with the DEA approach under different weighting schemes. *Journal of Environmental Planning and Management*, 67(6), 1347-1366. https://doi.org/10.1080/09640568.2023.2168523

Polukhina, A., Sheresheva, M., Efremova, M., Suranova, O., Agalakova, O., & Antonov-Ovseenko, A. (2021). The concept of sustainable rural tourism development in the face of COVID-19 crisis: Evidence from Russia. *Journal of Risk and Financial Management*, 14(1), 38. https://doi.org/10.3390/jrfm14010038

Purnomo, A. (2021). Development of Local Food in Tourism for Supporting Sustainable Indonesia Tourism Development. In In Proceedings of the 3rd International Conference on Social Sciences, Laws, Arts and Humanities, 104-109. https://doi.org/10.5220/0010003301040109

Rodríguez-Rodríguez, S. (2018). Turismo comunitario en Colombia: ¿retórica de Estado? [Community-based tourism in Colombia: State rhetoric?], *Turismo y sociedad*, 22, 195-212 (in Spanish). https://doi.org/10.18601/01207555.n22.10.

Sancho, A. (2005). Impactos Del Turismo Sostenible Sobre La Población Local [Impacts of Sustainable Tourism on Local Populations]. *Anuario Turismo y Sociedad* (4), 7-38. https://www.redalyc.org/articulo.oa?id=576276622001

Seidualin, D., Mussina, K., & Mukanov, A. (2025). Leveraging territorial branding for sustainable development and tourist attraction: Case of Ulytau, Kazakhstan. *Geojournal of Tourism and Geosites*, 58(1), 61–77. https://doi.org/10.30892/gtg.58106-1391

Soares, J. R. R., Casado-Claro, M. F., Lezcano-González, M. E., Sánchez-Fernández, M. D., Gabriel, L. P. M. C., & Abríl-Sellarés, M. (2021). The Role of the Local Host Community's Involvement in the Development of Tourism: A Case Study of the Residents' Perceptions toward Tourism on the Route of Santiago de Compostela (Spain). *Sustainability*, *13*(17), 9576. https://doi.org/10.3390/su13179576

Stoiljković, A., Marcikić Horvat, A., & Tomić, S. (2025). Assessing the Tourism Efficiency of European Countries Using Data Envelopment Analysis: A Sustainability Approach. *Sustainability*, 17(4), 1493. https://doi.org/10.3390/su17041493

Sudarmanto, E., Budi Raharjo, B., Kristiyanto, A., Sulaiman, S., Setyawati, H., Priyono, B., & Jariono, G. (2025). Una Revisión Sistemática Para El Desarrollo De Destinos Turísticos Sostenibles Basados En El Turismo Deportivo [A Systematic Review For The Development Of Sustainable Tourism Destinations Based On Sports Tourism]. *Retos*, 62, 646–654 (in Spanish). https://doi.org/10.47197/retos.v62.108401

Suluo, S., Mossberg, L., Andersson, T., Anderson, W., & Assad, M. (2023). Corporate sustainability practices in tourism - Evidence from Tanzania. *Tourism planning & development*, 20(5), 747-768. https://doi.org/10.1080/21568316.2020.1850515

Tinoco, O. (2003). Los impactos del turismo en el Perú [The impacts of tourism in Peru]. *Industrial data*, 6(1), 47-60 (in Spanish). https://doi.org/10.15381/idata.v6i1.5982

Tolkach, D., & King, B. (2015). Strengthening Community-Based Tourism in a new resource-based island nation: Why and how?. *Tourism Management*, 48, 386-398.https://doi.org/10.1016/j.tourman.2014.12.013

Trigo, A., & Silva, P. (2022). Directions for sustainable development for wine tourism in the Douro wine region, Portugal. *Sustainability*, 14(7), 3949 (in Spanish) https://doi.org/10.3390/su14073949

United Nations' (2023) Objetivos de desarrollo sostenible [Sustainable Development Goals] (in Spanish). https://www.un.org/sustainable development/es/objetivos-de-desarrollo-sostenible/.

Więckowski, M. (2021). Will the consequences of COVID-19 trigger a redefining of the role of transport in the development of sustainable tourism?. *Sustainability*, 13(4), 1887. https://doi.org/10.3390/su13041887

Zeng, X., Li, Y., Zhang, C., & Yang, X. (2024). Sustainable entrepreneurship in tourism: The interaction between tourism enterprise and community. *Journal of Hospitality and Tourism Management*, 60, 429-440. https://doi.org/10.1016/j.jhtm.2024.09.001

Article history: Received: 19.01.2025 Revised: 29.04.2025 Accepted: 26.05.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1067-1077
DOI 10.30892/gtg.602spl04-1480

IDENTIFICATION OF ROAD CRASH ZONES, SPATIAL PATTERNS, AND EMERGING HOT SPOTS OF ROAD TRAFFIC INJURY SEVERITY IN PHUKET, THAILAND

Pornperm SAE-NGOW [1], Nayot KULPANICH [1*], Morakot WORACHAIRUNGREUNG [1], Nuttakorn SITTARACHU [2], Kunyaphat THANAKUNWUTTHIROT [3], Phonpat HEMWAN [4]

[1]Suan Sunandha Rajabhat University, Faculty of Humanities and Social Sciences, Geography and Geo-Informatics Program, Bangkok, Thailand; pornperm.sa@ssru.ac.th (P.S.N.); nayot.ku@ssru.ac.th (N.K.); morakot.wo@ssru.ac.th (M.W.)
[2]Silpakorn University, Department of Innovation and Academic, Bureau of Digital Technology, Nakornpathom, Thailand; sittarachu_n@su.ac.th (N.S.)
[3]Suan Sunandha Rajabhat University, Faculty of Fine and Applied Arts, Digital Design and Innovation Field of Study, Bangkok, Thailand; kunyaphat.th@ssru.ac.th (K.T.)
[4]Chiang Mai University, Department of Geography, Faculty of Social Sciences, Chiang Mai, Thailand; phonpat.h@cmu.ac.th (P.H.)

Citation: Sae-Ngow, P., Kulpanich, N., Worachairungreung, M., Sittarachu, N., Thanakunwutthirot, K., & Hemwan, P. (2025). Identification of road crash zones, spatial patterns, and emerging hot spots of road traffic injury severity in Phuket, Thailand. *Geojournal of Tourism and Geosites*, 60(2spl), 1067–1077. https://doi.org/10.30892/gtg.602spl04-1480

Abstract: Road traffic accidents are a critical global concern. Thailand, a middle-income country, has the highest road traffic mortality rate in Southeast Asia. Phuket, which generates the second-highest tourism revenue in the country after Bangkok, faces road traffic accidents as one of the leading causes of death among both residents and tourists. This study aims to apply space-time cube (STC) analysis to identify high-risk road crash zones in Phuket. Secondary data on road accident locations from 2017 to 2023 were utilized for analysis. The methodological framework included the Severity Index analysis, Spatial Autocorrelation (Moran's I), Hotspot Analysis (Getis-Ord Gi*), and space-time cube (STC) analysis. The findings indicated an overall increase in road accidents across Phuket's road network, characterized by a rise in minor accidents and a decline in major accidents. This trend resulted in a yearly reduction in the average severity index from 2017 to 2023. Spatial analysis revealed that road accidents in Phuket exhibited a clustered pattern. The distribution of hot and cold spots was predominantly spatially random, accounting for 91.3% of all accident locations. The proportion of hot spots (4.710%) was higher than that of cold spots (3.995%). The spatial analysis of road accidents in Phuket Province, conducted using Getis-Ord statistics, identified Mueang Phuket District as the area with the highest concentration of accident hotspots, particularly in Rawai and Karon Subdistricts. Kathu District ranked second, with the majority of hotspots located in Patong Subdistrict. Thalang District followed, with Pa Khlok Subdistrict exhibiting the highest density of hotspots in that area Furthermore, the spatial distribution of road accidents suggests a strong correlation between high-risk zones and urban zones. The space-time cube (STC) analysis further identified both consecutive hot spots and sporadic hot spots, particularly in urban and built-up areas. These results offer empirical evidence to support spatially targeted traffic safety interventions. The integration of spatial and temporal perspectives highlights the dynamic nature of road crash patterns, enabling local authorities to prioritize areas for immediate and long-term interventions. This study contributes to the growing field of geospatial health by applying advanced spatial-temporal techniques to road safety analysis in a developing tourism context.

Keywords: traffic accidents, spatiotemporal patterns, space-time cube analysis, Getis-Ord Gi*, severity, Phuket, Thailand

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INTRODUCTION

Thailand is classified as a middle-income country (WHO, 2019; Korwatanasakul, 2023). Road safety is one of the most significant public health issues in the country and a critical concern for the Thai government (Road Safety Operation Center (RSOC) by Department of Disaster Prevention, 2023). Although Thailand has had a national road safety plan in place since 2013, its implementation has yet to achieve the desired outcomes (Thailand Development Research Institute, 2017). According to the 4th Global Status Report on Road Safety, Thailand recorded a road traffic fatality rate of 32.7 deaths per 100,000 population in 2018. Based on World Health Organization (WHO)'s estimation, this rate was the highest in Southeast Asia and ranked ninth among its 175 member countries. In 2016, there were 22,491 road traffic fatalities in Thailand, averaging 60 deaths per day. The most affected groups were individuals aged 15 to 29 and motorcyclists, who accounted for 74% of all road traffic fatalities (WHO, 2019). According to data from the Thailand Development Research Institute (TDRI), the economic losses from road traffic accidents in 2019 were estimated at 642,743.3 million baht (approximately 18.87 billion USD), equivalent to 5.9% of the GDP (Thailand Development Research Institute, 2017).

Thailand's primary income sources are tourism and agriculture (Sitthiyot, 2023). Phuket ranks as the second-highest province in tourism revenue, following Bangkok, among Thailand's 77 provinces, and is a major destination for international (Vongurai, 2018; Kongcharoen et al., 2021; Ministry of Tourism and Sports, 2024). However, road traffic

* Corresponding author

accidents are one of the leading causes of death in Phuket, resulting in significant loss of life and property and posing a substantial barrier to economic development. Road traffic fatalities in Phuket have shown a continuous upward trend, with an annual average of 135 deaths (approximately 11 per month). The situation is becoming increasingly severe, with the majority of fatalities involving motorcyclists who did not wear helmets, lacked driver's licenses, or included tourists using rental vehicles (Kongcharoen et al., 2021; Phuket Disaster Prevention and Mitigation, 2023).

The repeated occurrence of accidents in nearby areas identifies these locations as road traffic accident risk zones. Analyzing accident risk zones using spatial statistics, such as hotspot and coldspot analysis, involves identifying hotspots—locations specifically associated with frequent accidents resulting in loss of life and property. Hotspots are typically areas with a high concentration of accidents influenced by factors such as road characteristics, land use, and socio-economic conditions. Hotspots indicate zones where accident clusters occur more frequently compared to other areas within the study area. Meanwhile, coldspots exhibit characteristics entirely opposite to those of hotspots (Sae-Ngow et al., 2024). These findings support the work of relevant agencies by enabling the use of techniques and methods for efficient and rapid analysis and processing. This facilitates informed decision-making and policy formulation for managing road safety safety (Le et al., 2020; Tippayanate et al., 2024).

The application of GIS with accident location data to analyze road traffic accident risk zones using geostatistical analysis techniques has gained widespread popularity. This approach is particularly favored because its results can be presented visually as maps. Among the commonly used methods are Moran's I and Getis-Ord statistics, which effectively describe the spatial patterns of accidents and the degree of clustering of accident occurrences. A Moran's I index value of -1 indicates a dispersed spatial pattern, while a value of 0 reflects a random spatial pattern, and a value of +1 signifies a clustered spatial pattern (Getis & Ord, 1992; Amiri et al., 2021; Hazaymeh et al., 2022). Meanwhile, the Getis-Ord statistics, a local spatial analysis method of spatial autocorrelation, examines the relationship between neighboring phenomena to identify accident risk zones and provide detailed insights into the clustering levels of both hotspots and coldspots (Sababhi et al., 2024). In addition to the previously mentioned methods, there is also the 'space-time cube (STC) analysis,' which integrates spatial and temporal dimensions to identify hotspots and coldspots.

This method generates a three-dimensional map where the study area is represented on the horizontal axes (x and y) as a two-dimensional space, while the z-axis depicts changes over time (Khan et al., 2023). The results provide spatial patterns, spatial relationships, and temporal changes over the study period (Alam & Tabassum, 2023). This study utilized accident location data from Phuket's road network to assess accident risk. Spatial pattern analysis was employed to identify accident hotspots and cold spots. Additionally, a space-time cube analysis was conducted to examine spatiotemporal patterns and their evolution over time. To enhance the analysis, multiple time slices were defined, enabling a comparative evaluation of temporal variations in hotspot distributions (Hamami & Matisziw, 2021; Wu et al., 2021; Feizizadeh et al., 2022).

MATERIALS AND METHODS

Study Area

Phuket Province is located in the southern part of Thailand, specifically between latitudes 7°45′ and 8°15′ north and longitudes 98°15′ and 98°40′ east. It is the largest island in the country, situated in the Andaman Sea. To the north, it is connected to Phang Nga Province by the Sarasin Bridge and the Srisoonthorn Bridge. To the east, it is adjacent to Phang Nga Province, with the entire island surrounded by the Indian Ocean. It also includes islands within its jurisdiction to the south and east. The total area is 543.034 square kilometers, with a population of 423,599 people (Department of Provincial Administration, Ministry of the Interior, 2021). The population density is 780.05 people per square kilometer, ranking it fifth in Thailand. This study follows a research methodology based on a research design that includes data collection, data preparation, and data analysis, with detailed information presented in Figure 1.

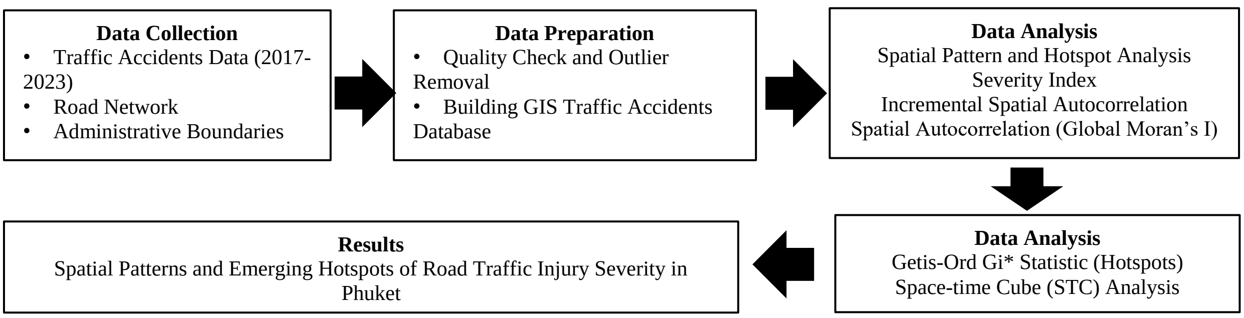


Figure 1. Conceptual framework

RESEARCH DATA

1. Data Preparation for Analysis

The secondary data used for analysis consists of road accident location data from the road network spanning from 2017 to 2023 (Department of Highways, 2023), as shown in Table 1. The study area is Phuket Province, and the data collection period is from January 1, 2017, to December 31, 2023. The details of the data include coordinates, road names, damage information, and causes leading to accidents. The researcher verified the accuracy of the data, removed any outliers, and then constructed a spatial accident database for the road network.

Table 1. Research data

NO.	Data	Resolution	Source
1.	Road accident location data on national highways and rural roads	Coordinates	Department of Highways
2.	Administrative boundaries of Phuket Province	1:25,000	Ministry of Interior
3.	Road transportation routes	1:25,000	Ministry of Transport
4.	Land Use of Phuket Province	1:25,000	Land Development Department

In this article, the spatial accident data on Phuket's road network were analyzed to identify accident-prone areas in the province. The analysis process was divided into several steps. First, the severity index analysis was conducted to determine the severity level of accidents at each location. Next, incremental spatial autocorrelation analysis was used to define the distance and determine the optimal distance for spatial pattern analysis. Following this, a global indicator of spatial autocorrelation analysis was carried out to identify the overall spatial pattern of accidents on Phuket's road network, whether it was random, dispersed, or clustered. Additionally, hotspot and coldspot analysis (Hot Spot Analysis - Getis-Ord Gi*) was used to identify the occurrence of hot and cold spots of accidents. Finally, emerging hotspots analysis examined hot and cold spots in relation to time using space-time cube (STC) analysis.

2. Spatial pattern analysis of accidents on the road network

i. Crash Severity Analysis

The severity of road accidents was assessed using the Crash Severity Index (CSI). This index assigns weights to different types of collisions to determine their overall severity. A fatal collision is weighted as 3.0, a serious injury collision as 1.8, a slight injury collision as 1.3, and a property damage-only collision as 1.0, as shown in Equation (1) (Tola et al., 2021).

$$SI = 3.0 * X1 + 1.8 * X2 + 1.3 * X3 + 1.0 * X4 \quad (1)$$

Where: X1 is fatal crashes, X2 is serious injury crashes, X3 is slight injury crashes, and X4 is property-damage-only crashes respectively.

ii.Global Indicator of Spatial Autocorrelation (Global Moran's I Analysis)

The Global Indicator of Spatial Autocorrelation (Global Moran's I) measured the level and direction of the spatial distribution of accidents on the road network. The results were classified into three patterns: clustered, dispersed, or random. This analysis used the Global Moran's I spatial autocorrelation value, the z-score, and the p-value to describe the relationships. The formula for calculating Global Moran's I is provided in Equation (2) Getis & Ord, 1992).

$$I = \frac{n}{w} * \frac{\sum\Sigma w_{ij}(x_i - \bar{x})(x_j - \bar{x})}{\sum(x_i - \bar{x})^2} \quad (2)$$

Where: I is Moran's I Index, x_i is the observed value of area i, x_j is the observed value of area j, $\bar{x}$ is the average of observed values, n is the number of observations. w is the aggregate of the spatial weight matrix and w_{ij} is the spatial weight matrix. For the analysis, an appropriate distance was selected to define the analysis boundary. A fixed distance was determined based on the principles of spatial autocorrelation. Spatial data within this distance were assigned weights, while data beyond this distance were assigned a weight of zero. The Euclidean distance, as shown in Equation (3), was employed to calculate the distance between accident locations and neighboring data points. The specific distance was determined through Incremental Spatial Autocorrelation analysis (Hazaymeh et al., 2022).

$$d = \sqrt{(X_2 - X_1)^2 + (Y_2 - Y_1)^2} \quad (3)$$

Where: (X_2, Y_2) are the geographic coordinates of spot a, (X_1, Y_1) are the geographic coordinates of spot b and d is the distance between a and b. The Global Moran's I coefficient for spatial autocorrelation ranges from -1 to +1. A positive spatial autocorrelation, represented by values between 0 and +1, indicates a clustered spatial pattern. In contrast, a negative spatial autocorrelation, represented by values between 0 and -1, indicates a dispersed spatial pattern. A value of 0 signifies a random spatial pattern.

iii. Hotspot Analysis (Getis-Ord Gi*)

The Hotspot Analysis (Getis-Ord Gi*) of road accidents in Thailand's network utilized spatial autocorrelation at the local level, specifically employing the Local Indicator of Spatial Association (LISA). This inferential approach involved hypothesis testing to examine the observed spatial patterns of accident data.

The results of the hotspot and coldspot analysis are explained using the z-score and p-value. The analysis examines each location in the dataset along with the surrounding locations. The z-score becomes statistically significant when the sum of observations at each location and its neighboring area differs from the sum of predicted values for each location and its neighboring area. If the difference is large enough to indicate that the pattern is not random, the null hypothesis is rejected, indicating a spatial clustering. If the null hypothesis is accepted, meaning there is no spatial clustering, the level of spatial grouping can be explained relative to the neighboring areas (Anselin, 1995).

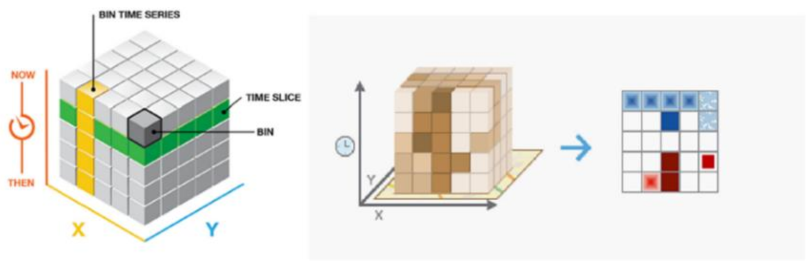
For hotspot and coldspot occurrences, if the observation points and surrounding points have high values, this is considered a hotspot (with a positive z-score). If the values are low, this is considered a cold spot (with a negative z-score) (Getis & Ord, 1992; Hazaymeh et al., 2022; Mesquitela et al., 2022). The formula for Getis-Ord Gi* is:

$$G_i^* = \frac{\sum_{j=1}^{n} w_{i,j}x_j - \bar{X}\sum_{j=1}^{n} w_{i,j}}{S\sqrt{\frac{\left[n\sum_{j=1}^{n} w_{i,j}^2 - \left(\sum_{j=1}^{n} w_{i,j}\right)^2\right]}{n-1}}} \tag{5}$$

Where: G_{i*} is the Getis-Ord Gi* score at any location, x_j is the observed value at location j, $\bar{x}$ is the average of the observed values, w_{ij} is the weight between locations i and j, s is the standard deviation of the observed values and n is the total number of areas. The result of the calculation of G_{i*}must be verified with the z-score and p-value.

iv. Space-Time Cube Analysis

Space-time cube (STC) analysis is a method for comparing spatial and temporal patterns of accidents in the form of a cube, where the X and Y axes represent spatial dimensions, and the t-axis represents the time dimension. In this research, a grid cell size of 340*340 meters was used, covering the entire road network of Phuket Province with a total of 3,417 grids. The temporal dimension was used to compare accident occurrences over 90-day and 180-day periods in order to track the changes in hot spots and cold spots over time. Figure 2 illustrates the space-time cube (STC) analysis, which compares the spatial and temporal occurrence of accidents in the form of a cube, with the X and Y axes representing spatial dimensions and the t-axis representing time.



(a) (b)

Figure 2. Structure of STC from emerging hotspot analysis: (a) Space-time cube (STC) 3D and (b) Generated bins in 2D (Source: Environmental Systems Research Institute, 2024a; Khan et al., 2023)

RESULTS AND DISCUSSION

1. A study of the changes in road accidents in Phuket Province from 2017 to 2023

According to the accident report system of the Ministry of Transport, there were a total of 44,458 road accidents from 2017 to 2023 in Phuket. These accidents resulted in 447 deaths, 7,198 serious injuries, 36,322 minor injuries, and 491 cases of property damage. The occurrence of road accidents has shown a general increase each year, with the only exception being during the COVID-19 pandemic, when accidents decreased. However, after the country reopened and the COVID-19 situation subsided, the trend of increasing accidents resumed.

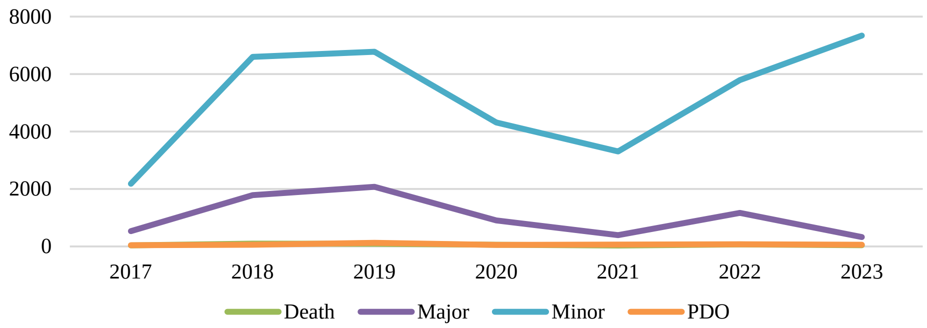


Figure 3. The annual number of accidents in Phuket (2017-2023) (Source: Author's own work)

From Figure 3 and Table 2, the average severity level of each collision type is shown along with the number of accidents in Phuket Province. The number of accidents involving minor injuries shows an increasing trend, while accidents involving serious injuries have decreased. The average severity level decreased each year from 2017 to 2023, respectively.

Table 2. The Annual Number of Accidents in Phuket (2017-2023) (Source: Author's own work)

Years	Average of SI	Death	Major	Minor	PDO	Total
2017	1.41355	38	533	2,181	45	2,797
2018	1.42227	101	1,785	6,600	63	8,549
2019	1.42837	97	2,077	6,777	127	9,078
2020	1.40146	61	909	4,318	54	5,342
2021	1.36071	31	395	3,309	65	3,800
2022	1.39671	74	1,172	5,794	78	7,118
2023	1.32860	45	327	7,343	59	7,774

2. Frequency of Road Accidents by Month from January to December in Phuket (2017-2023)

Road accidents from 2017 to 2023, when analyzed month by month, revealed a gradual increase in the overall number of accidents starting in August, peaking in December and January, before gradually decreasing until April. The mid-year period, from May to September, coincided with the rainy season, which is not a peak tourist season in Phuket. The details are illustrated in Figure 4.

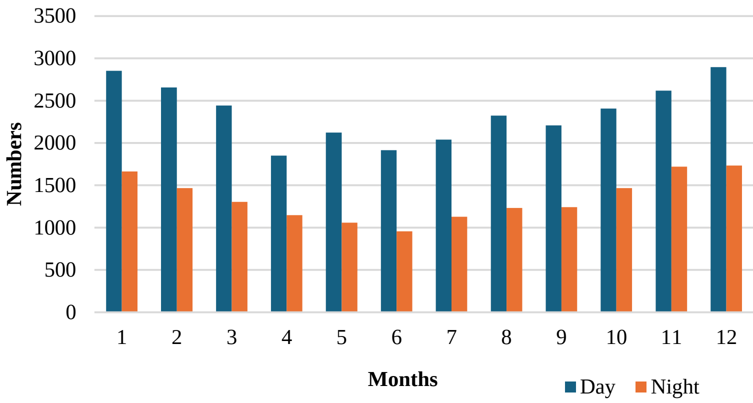


Figure 4. The number of traffic accidents in Phuket by month (2017-2023) (Source: Author's own work)

The number of accidents by subdistrict in Phuket Province from 2017 to 2023, classified by standard deviation, shows that the subdistrict with the highest number of accidents was Wichit Subdistrict in Mueang Phuket District, followed by Talat Yai Subdistrict in Mueang Phuket District, Kathu Subdistrict in Kathu District, and Ratsada Subdistrict in Mueang Phuket District. The map (Figure 5) illustrates that accidents in Phuket Province were more concentrated in the central area than in other regions.

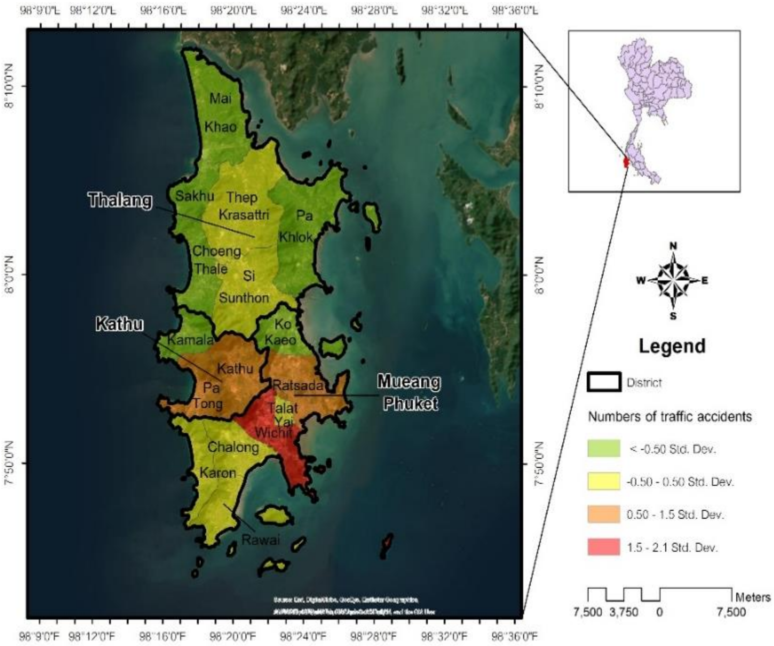
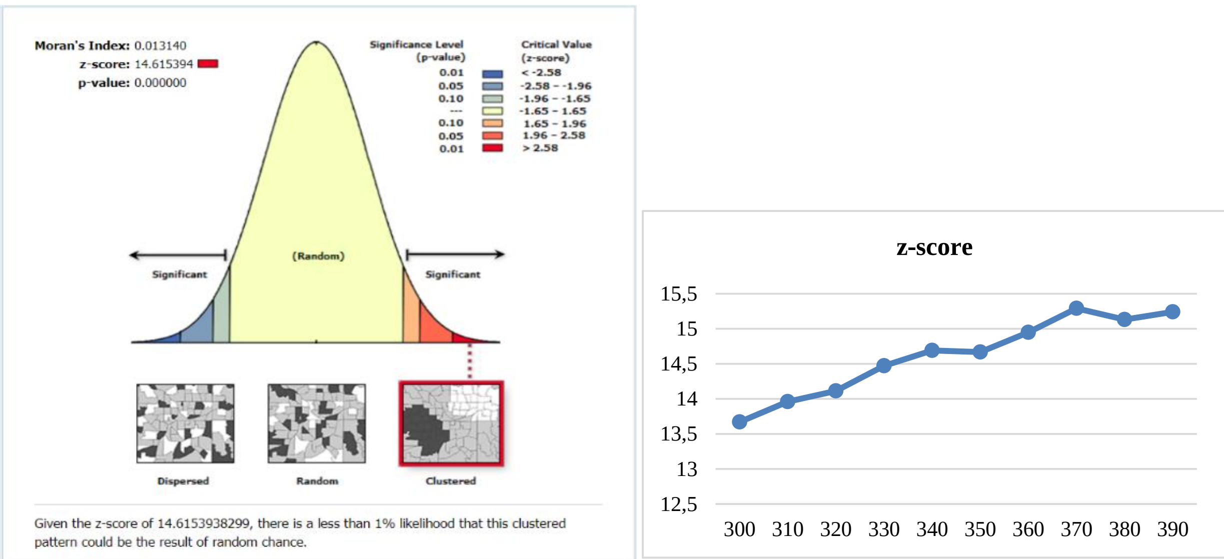


Figure 5. Number of accidents by subdistrict in Phuket (2017-2023), classified by standard deviation (Source: Author's own work)

3. Spatial Pattern Analysis of Road Accidents in Phuket

The analysis results, based on the locations of road accidents, revealed the trend of spatial patterns using the level of spatial autocorrelation. The Global Moran's I index was found to be 0.013140, with a p-value of 0. Considering the z-score of 14.615, this indicates less than a 1% probability that this spatial pattern was a random outcome. Therefore, it is concluded that the pattern was clustered (Figure 6).

For tracking the spatial pattern of road accidents in Phuket Province using the Getis-Ord statistic, the results from Incremental Spatial Autocorrelation analysis were used to determine the appropriate distance for the analysis.



(a) (b)

Figure 6. Results of (a) global spatial autocorrelation and (b) incremental spatial autocorrelation analyses

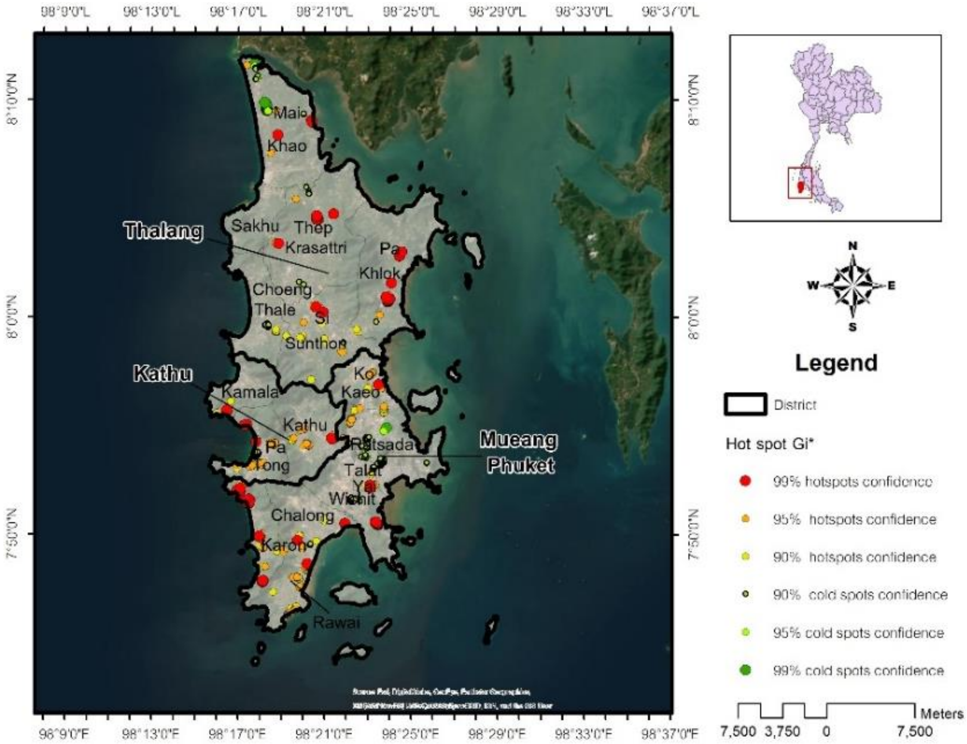


Figure 7. Monthly hotspot Gi* analysis for Phuket (2017-2023) (Source: Author's own work)

The z-scores and p-values for each accident location were categorized into red, green, or gray points with statistical significance, taking into account the severity of accidents in the surrounding areas. For instance, red points indicate severe accidents surrounded by statistically significant similar values, meaning they represent major accidents. Green points indicate minor accidents surrounded by statistically significant minor accidents, while gray points represent locations with no statistical significance, surrounded by randomly distributed severity values. Both hotspots (red) and coldspots (green) were divided into three levels: 90%, 95%, and 99%. The analysis of the spatial pattern of road accidents in Phuket Province using Getis-Ord statistics revealed that the highest number of hotspots occurred in Mueang Phuket District, particularly in Rawai Subdistrict and Karon Subdistrict. The second highest number of hotspots was found in Kathu District, specifically in Patong Subdistrict, followed by Thalang District, where the highest concentration of hotspots occurred in Pa Khlok Subdistrict, as shown in Figure 7. According to Table 3 and Table 4, when the results of the Getis-Ord spatial autocorrelation analysis were used to create a correlation table to study the characteristics of hotspots and coldspots in relation to road accidents in Phuket Province, it was found that 91.3% of road accidents in Phuket from 2017 to 2023 occurred in a spatially random pattern.

Table 3. Hotspots and coldspots by subdistrict in Phuket

District	Subdistrict	Coldspots			None	Hotspots			
		99%	95%	90%	Not significant	90%	95%	99%	Total
Kathu	Kamala				824	8		3	835
	Kathu				4.247	40	58	6	4.351
	Pa Tong		13	440	3.297	160	59	4	3.973
Kathu Total			**13**	**440**	**8.368**	**208**	**117**	**13**	**9.159**
Mueang Phuket	Chalong			17	3.207	17	1	3	3.245
	Karon				2.001	81	63	166	2.311
	Ko Kaeo				1.296	35	49	1	1.381
	Ratsada	1	153	207	3.717	44	19		4.141
	Rawai				1.968	243	563	1	2.775
	Talat Nuea			3	2.306	8	20	2	2.339
	Talat Yai		287	504	4.064				4.855
	Wichit			22	5.584	38	34	61	5.739
Mueang Phuket Total		**1**	**440**	**753**	**24.143**	**466**	**749**	**234**	**26.786**
Thalang	Choeng Thale			31	1.731	47			1.809
	Mai Khao	48	10	26	979	1	15	5	1.084
	Pa Khlok			1	578	5	21	91	696
	Sakhu				526				526
	Si Sunthon			4	2.260	83	10	2	2.359
	Thep Krasattri			9	2.003		5	22	2.039
Thalang Total		**48**	**10**	**71**	**8.077**	**136**	**51**	**120**	**8.513**
Province Total		**49**	**463**	**1.264**	**40.588**	**810**	**917**	**367**	**44.458**

Table 4 shows that the average of severity levels (SI) for hotspots and coldspots differed. The average of SI for hotspots was higher than that for cold spots, and the proportion of hot spots was greater than that of cold spots, at 4.710% and 3.995%, respectively. The spatial patterns observed were statistically significant as follows:

i. Coldspots (99% CI) had an average SI of 1.118 (0.11%)
ii. Coldspots (95% CI) had an average SI of 1.354 (1.04%)
iii. Coldspots (90% CI) had an average SI of 1.360 (2.84%)
iv. Not significant had an average SI of 1.391 (91.30%)
v. Hotspots (90% CI) had an average SI of 1.465 (1.82%)
vi. Hotspots (95% CI) had an average SI of 1.463 (2.06%)
vii. Hotspots (99% CI) had an average SI of 1.578 (0.83%)

Table 4. Characteristics of traffic accidents

Class	Number of traffic accidents	Average of SI	Percent	Death	Major	Minor	PDO
Cold spot (99% CI)	49	1.118	0.11	0	2	14	33
Cold spot (95% CI)	463	1.354	1.04	1	50	407	5
Cold spot (90% CI)	1.264	1.360	2.84	4	141	1.115	4
Not significant	40588	1.391	91.30	374	6.446	33.348	420
Hot spot (90% CI)	810	1.465	1.82	23	199	573	15
Hot spot (95% CI)	917	1.463	2.06	22	233	649	13
Hot spot (99% CI)	367	1.578	0.83	23	127	216	1
Grand Total	44.458	-	100.00	447	7.198	36.322	491

The space-time cube (STC) analysis compared the spatial and temporal patterns of accidents by defining a 340-meter bandwidth, resulting in 3,471 cubes which covered the transportation routes in Phuket Province. This method identified six distinct spatial-temporal patterns of accident occurrences. Time slices of 90 and 180 days were used to examine how hotspots and coldspots changed over time. The findings showed that the majority of accidents in Phuket during both time periods displayed no distinct pattern, accounting for 97.29% and 97.98%, respectively. The sporadic pattern followed, with 2.42% and 1.53%, while consecutive patterns accounted for 0.29% and 0.49%, respectively.

From Figures 8-10, it can be observed that during the time slice of 90 days and 180 days, the number of Consecutive Hotspots increased, while the number of Sporadic Hotspots decreased. Additionally, the number of No Pattern occurrences increased slightly. Out of the total 3,471 cubes in the space-time cube, 47.1% were in Thalang, 39.7% in Mueang Phuket, and 13.0% in Kathu. Consecutive hotspots were found only in Mueang Phuket and Kathu. A temporal comparison between the 90-day and 180-day time slices revealed changes in the Emerge Cube Hotspots.

Table 6-7 illustrates the changes in hotspots of traffic accidents in Phuket Province from the 90-day to the 180-day time slice, showing shifts in space-time patterns as follows: Sporadic Hotspots (irregular occurrences) changed to Consecutive Hotspots (continuous occurrences), with 11 hotspots. Sporadic Hotspots transitioned to No Pattern (no distinct spatial pattern), with 20 hotspots. Consecutive Hotspots changed to No Pattern, with 4 hotspots.

Table 5. Names and definitions of the space-time patterns (Source: Environmental Systems Research Institute, 2024b; Khan et al., 2023)

Patterns	Patterns Name	Definition
	Consecutive Hot/Cold Spot	A location with a single uninterrupted run of statistically significant hot/cold spot bins in the final time-step intervals. The location has never been a statistically significant hot/cold spot before the final hot/cold spot run and fewer than 90% of all bins are statistically significant hot/cold spots.
	Sporadic Hot/Cold Spot	A location that is an on-again off-again hot/cold spot. Fewer than 90% of the time-step intervals have been statistically significant hot/cold spots and none of the time-step intervals have been statistically significant cold/hot spots.
	No Pattern Detected	Does not fall into any of the defined hot or cold spot patterns.

Table 6. Traffic accident hotspots in Phuket between the 90-day and 180-day time slices

District	Consecutive 90d	Consecutive 180d	No Pattern 90d	No Pattern 180d	Sporadic 90d	Sporadic 180d
Kathu	2 (0.06%)	6 (0.17%)	431 (12.42%)	432 (12.45%)	21 (0.61%)	16 (0.46%)
Mueang Phuket	8 (0.23%)	11 (0.32%)	1318 (37.97%)	1339 (38.58%)	53 (1.53%)	29 (0.84%)
Thalang	0 (0%)	(0%)	1628 (46.90%)	1630 (46.96%)	10 (0.29%)	8 (0.23%)
Total	10 (0.29%)	17 (0.49%)	3377 (97.29%)	3401 (97.98%)	84 (2.42%)	53 (1.53%)

Table 7. Changes in hotspots of traffic accidents in Phuket from the 90-day to the 180-day time slice

The 90-day time slice	The 180-day time slice			
	Consecutive Hot Spot	No Pattern	Sporadic Hot Spot	Total
Consecutive Hot Spot	6	4	0	10
No Pattern	0	3377	0	3377
Sporadic Hot Spot	11	20	53	84
Total	17	3401	53	3471

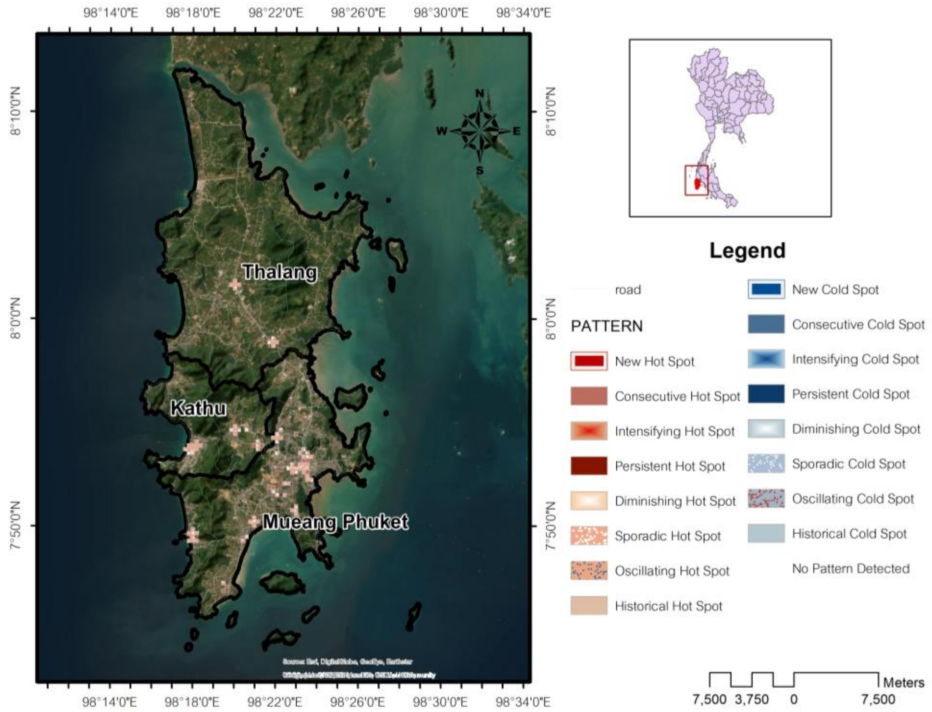


Figure 8. Space-time patterns with a time slice of 90 days for traffic accidents in Phuket

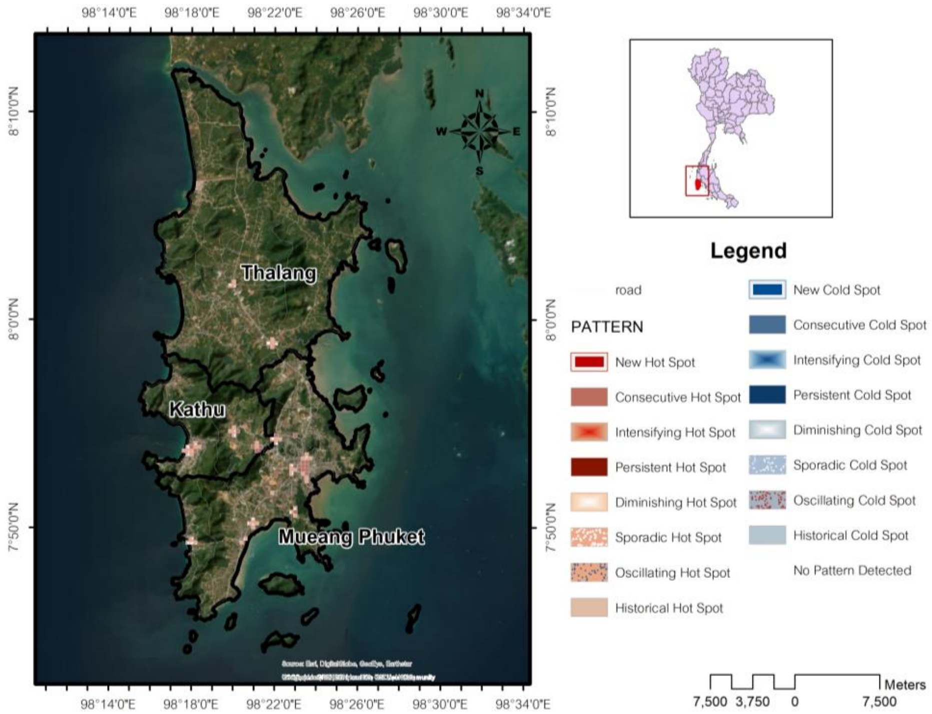
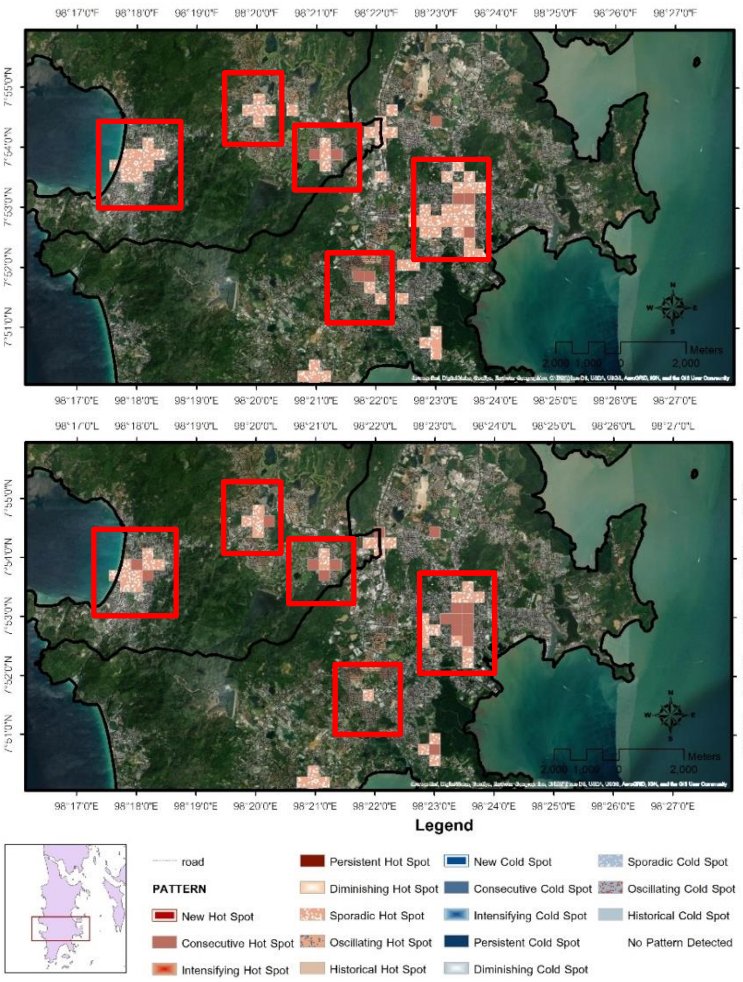


Figure 9**.** Space-time patterns with a time slice of 180 days for traffic accidents in Phuket

The analysis of traffic accident changes in Phuket between 2017 and 2023, along with the examination of monthly accident frequency from January to December of the same years, showed that accidents with lower severity tended to occur in areas with higher traffic density due to the lower speeds. This is in contrast to accidents resulting in fatalities, which tended to occur in areas with lower traffic density. Additionally, most accidents in Phuket involved motorcycles.

According to vehicle registration statistics in Phuket, motorcycles accounted for 61% of all registered vehicles in the province (Phuket Provincial Disaster Prevention and Mitigation Office, 2024). This is because motorcycles were affordable, highly maneuverable, and well-suited for use in densely trafficked urban areas in Thailand (Kongcharoen et al., 2021, Sirikup, 2016). Furthermore, the geographic characteristics of Phuket, being an island with limited space, alongside traffic congestion, leaded both local residents and international tourists to choose motorcycles for daily travel. This fostered a significant relationship between motorcycle-related commercial activities, services, and repairs, particularly with regard to foreign tourists (Prueksakorn et al., 2018; Sirikup, 2016).

(a)



(b)

Figure 10. Changes in hotspots of traffic accidents in Phuket from the 90-day to the 180-day time slice:
(a) Space-time patterns with a time slice of 90 days (b) Space-time patterns with a time slice of 180 days (Source: Author's own work)

The results of the spatial pattern analysis of traffic accidents in Phuket indicated that the accident patterns were clustered, with a cluster distance of 340 meters. The hotspot and coldspot analysis revealed that the highest concentration of hotspots and coldspots was in the central area of the province. The most significant hotspot was located in the Mueang Phuket District, specifically in the Rawai and Karon Subdistricts. In the Kathu District, the highest concentration of hotspots was found in the Patong Subdistrict, while in Thalang District, the hotspots were most concentrated in the Pa Khlok Subdistrict, as shown in Figure 11. These areas were urban zones, central to residential areas, commerce, services, and heavy traffic (Alsahfi, 2024; Ma et al., 2021; Özcan & Küçükönder, 2020; Prueksakorn et al., 2018).

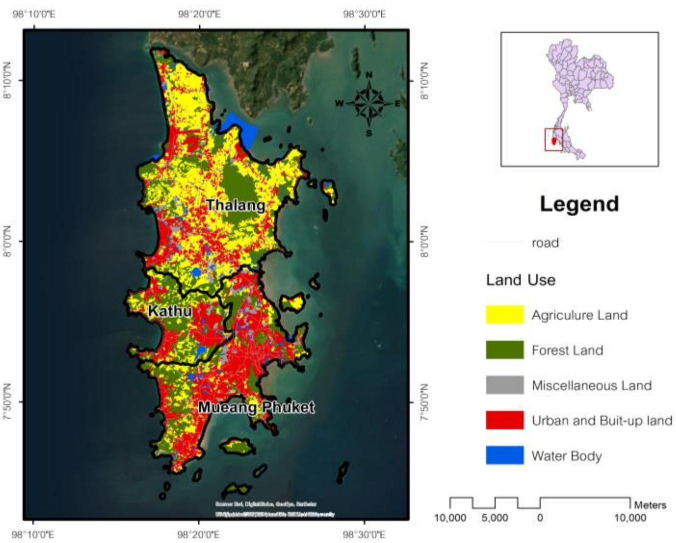


Figure 11. Land use map of Phuket (Source: Land Development Department, 2022)

For the comparison of spatial patterns over time, between 90 and 180-day periods, both time slices predominantly exhibited the "No Pattern" pattern, followed by "Sporadic," and lastly "Consecutive." The addition of time conditions in the space-time cube (STC) analysis resulted in the following changes: (1) an increase in "Consecutive Hotspots," (2) a decrease in "Sporadic Hotspots," and (3) a slight increase in "No Pattern." Furthermore, the analysis revealed the following transitions: (a) "Consecutive Hotspots" to "No Pattern," (b) "Sporadic Hotspots" to "No Pattern," and (c) "Sporadic Hotspots" to "Consecutive Hotspots." In region (a) and (b) reveal distinct temporal patterns when analyzed using a 90-day time slice in a space-time cube (STC) framework. Region (a) consistently exhibits hot spots, indicating a sustained pattern. In contrast, region (b) displays intermittent hot spots suggesting a more sporadic occurrence. However, when the time slice is extended to 180 days, neither region presents a clear spatiotemporal pattern. This implies that the events occurring in these areas may be random or influenced by factors not captured within the analyzed timeframe.

In region (c), during the 90-day time slice, events or incidents tend to occur intermittently, with a surge in hot spots observed in the final period. Less than 90% of all points within this time slice are statistically significant hot spots, and no statistically significant cold spots are detected. However, when the time slice is extended to 180 days, a persistent pattern of statistically significant hot spots emerges in the final period. This region had not previously exhibited significant hot spots. Moreover, less than 90% of all points within the 180-day time slice are statistically significant hot spots. These findings suggest a propensity for events to occur towards the end of the 180-day time slice. The patterns of consecutive and sporadic hot spots remain consistent across both 90-day and 180-day time slices. This indicates that the likelihood of accidents occurring within these regions remains unchanged, regardless of the analysis window. For instance, sporadic hot spots continue to exhibit alternating periods of high and low accident rates every 90 or 180 days. Similarly, consecutive hot spots maintain their tendency to experience a surge in accidents towards the end of the 90-day or 180-day period, making them more prone to accidents compared to regions transitioning from consecutive or sporadic hot spots to no pattern.

CONCLUSION

The overall number of traffic accidents on Phuket's road network had increased, with a rise in minor accidents and a decrease in major accidents. As a result, the average severity level of accidents decreased each year between 2017 and 2023. The analysis of Global Moran's I, combined with the severity levels of accidents, revealed that accidents on Phuket's road network exhibited a clustered spatial pattern. Hotspot analysis using the Getis-Ord Gi* method identified accident-prone areas, showing the severity levels at these hotspots and their surrounding regions, including both hot and cold spots. This approach provides a more accurate understanding of the spatial patterns and severity levels of road accidents than tabular data, which only includes details of accidents and their coordinates. Additionally, space-time cube analysis was used to compare spatial and temporal patterns of accidents, allowing for the identification of changes, trends, and the severity levels of accidents over time. The findings of this research provide valuable insights into accident occurrences on Phuket's road network, highlighting the clustering of accidents in various areas of the province and trends in the changing frequency of accidents. These results can serve as a foundation for enhancing road safety initiatives, supporting traffic engineering efforts, and informing policy decisions related to traffic regulation enforcement.

Author Contributions: Conceptualization, P.S. and N.K.; methodology, P.S. and N.K.; software, P.S. and N.S.; validation, P.S., N.K and M.W.; formal analysis, P.S., N.K. and M.W.; investigation, P.S., N.K. and P.H.; data curation, P.S., N.K., M.W. and K.T.; writing - original draft preparation, P.S. and N.K.; writing - review and editing, P.S., N.K., M.W., K.T. and P.H; visualization, P.S., N.K., M.W., N.S. and K.T.; supervision, P.S., N.K., M.W. and P.H.; project administration, P.S. and N.K. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgments: This research was financially supported by the Institute of Research and Development, Rajabhat Suan Sunandha University in the fiscal year 2023. It was successfully completed with the assistance of students as well as cooperation and guidance from the faculty members of the Department of Geography and Geospatial Information, Rajabhat Suan Sunandha University.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Alam, M. S., & Tabassum, N. J. (2023). Spatial pattern identification and crash severity analysis of road traffic crash hot spots in Ohio. *Heliyon*, 9(5), e16303. https://doi.org/10.1016/j.heliyon.2023.e16303

Alsahfi, T. (2024). Spatial and temporal analysis of road traffic accidents in major Californian cities using a geographic information system. *ISPRS International Journal of Geo-Information*, 13(5), 157. https://doi.org/10.3390/ijgi13050157

Amiri, A. M., Nadimi, N., Khalifeh, V., & Shams, M. (2021). GIS-based crash hotspot identification: A comparison among mapping clusters and spatial analysis techniques. *International Journal of Injury Control and Safety Promotion*, 28(3), 325–338. https://doi.org/10.1080/17457300.2021.1925924

Anselin, L. (1995). Local indicators of spatial association - LISA. *Geographical Analysis*, 27(2), 93–115. https://doi.org/10.1111/j.1538-4632.1995.tb00338.x

Ben-Hamouche, M., Al-Janahi, A., & Al-Madani, H. (2011). Traffic accidents in Bahrain: A statistical and spatial GIS-based analysis. *Journal of King Saud University*, 23(1), 1–18.

Department of Highways. (2023). *Traffic accidents on national highways*. Retrieved 20.12.2023. https://data.go.th/th/dataset/gdpublish-roadaccident

Department of Provincial Administration, Ministry of the Interior. (2021). *Announcement of the Central Registration Office, Department of Provincial Administration: Number of people throughout the Kingdom, classified by Bangkok Metropolis and other provinces according to the registration record as of December 31, 2021.* [PDF]. http://stat.bora.dopa.go.th/stat/pk/pk_64.pdf

Esri. (2024a). *Emerging hot spot analysis (space time pattern mining)*. Retrieved September 18, 2024. https://pro.arcgis.com/en/pro-app/latest/tool-reference/space-time-pattern-mining/emerginghotspots.htm

Esri. (2024b). *How Emerging Hot Spot Analysis work)*. Retrieved September 18, 2024. https://pro.arcgis.com/en/pro-app/latest/tool-reference/space-time-pattern-mining/learnmoreemerging.htm

Feizizadeh, B., Omarzadeh, D., Sharifi, A., Rahmani, A., Lakes, T., & Blaschke, T. (2022). A GIS-Based Spatiotemporal Modelling of Urban Traffic Accidents in Tabriz City during the COVID-19 Pandemic. *Sustainability*, 14(12), 7468. https://doi.org/10.3390/su14127468

Getis, A., & Ord, J. K. (1992). The analysis of spatial association by use of distance statistics. *Geographical Analysis*, 24(3), 189–206. https://doi.org/10.1111/j.1538-4632.1992.tb00261.x

Hamami, A., & Matisziw, T. (2021). Measuring the spatiotemporal evolution of accident hot spots. *Accident; analysis and prevention*, 157, 106133 . https://doi.org/10.1016/j.aap.2021.106133.

Hazaymeh, K., Almagbile, A., & Alomari, A. H. (2022). Spatiotemporal analysis of traffic accidents hotspots based on geospatial techniques. *ISPRS International Journal of Geo-Information*, 11(4), 260. https://doi.org/10.3390/ijgi11040260

Khan, I. U., Vachal, K., Ebrahimi, S., & Wadhwa, S. S. (2023). Hotspot analysis of single-vehicle lane departure crashes in North Dakota. *IATSS Research*, 47(1), 25–34. https://doi.org/10.1016/j.iatssr.2022.12.003

Kongcharoen, J., Onmek, N., Karrila, S., & Seksan, J. (2022). Risk factors related to road traffic accidents in Phuket Province, Southern Thailand: A confirmatory factor analysis. *Transactions on Transport Sciences*, 13(1), 17–25. https://doi.org/10.5507/tots.2021.020

Korwatanasakul, U. (2023). Thailand and the middle-income trap: An analysis from the global value chain perspective. *Institutions and Economies*, 15(4), 7–33. https://doi.org/10.22452/IJIE.vol15no4.1

Land Development Department. (2022). Land use map of Phuket. Retrieved September 18, 2024, from https https://dinonline.ldd.go.th/

Le, K. G., Liu, P., & Lin, L. T. (2020). Determining the road traffic accident hotspots using GIS-based temporal-spatial statistical analytic techniques in Hanoi, Vietnam. *Geo-spatial Information Science*, 23(2), 153–164. https://doi.org/10.1080/10095020.2019.1683437

Ma, Q., Huang, G., & Tang, X. (2021). GIS-based analysis of spatial–temporal correlations of urban traffic accidents. *European Transport Research Review*, 13, 1–11. https://doi.org/10.1186/s12544-021-00509-y

Mesquitela, J., Elvas, L. B., Ferreira, J. C., & Nunes, L. (2022). Data analytics process over road accidents data - a case study of Lisbon city. *ISPRS International Journal of Geo-Information*, 11(2), 143. https://doi.org/10.3390/ijgi11020143

Ministry of Tourism and Sports. (2024). *Tourism statistics 2023*. Bangkok: Ministry of Tourism and Sports. https://www.mots.go.th/news/category/704

Özcan, M., & Küçükönder, M. (2020). Investigation of spatiotemporal changes in the incidence of traffic accidents in Kahramanmaraş, Turkey, using GIS-based density analysis. *Journal of the Indian Society of Remote Sensing*, 48(7), 1045–1056. https://doi.org/10.1007/s12524-020-01137-0

Phuket Disaster Prevention and Mitigation. (2023). *Phuket road safety action plan 2024*. Phuket: Phuket Disaster Prevention and Mitigation. Retrieved September 18, 2024, from https://pkt.disaster.go.th/pkt/cms/inner_2921?id=99243

Phuket Provincial Disaster Prevention and Mitigation Office. (2024). *Lessons learned from the prevention and reduction of road and sea accidents during the Songkran Festival BE 2567*, Phuket Province [Report No. 2921]. Retrieved September 18, 2024, from https://pkt.disaster.go.th/pkt/cms/2921?id=110294

Prueksakorn, K., Gonzalez, J. C., Keson, J., Wongsai, S., Wongsai, N., & Akkajit, P. (2018). A GIS-based tool to estimate carbon stock related to changes in land use due to tourism in Phuket Island, Thailand. *Clean Technologies and Environmental Policy*, 20, 561–571. https://doi.org/10.1007/s10098-017-1455-5

Road Safety Operation Center (RSOC) by Department of Disaster Prevention. (2023). *Thailand road safety master plan 2022–2027. Bangkok: Department of Disaster Prevention.* Retrieved September 18, 2024. https://roadsafety.disaster.go.th/roadsafety/download/7377?id=21555

Sababhi, S., Aldala'in, S., Al Taani, A., Al Rawashdeh, S., Al Barari, T., Aladwan, Z., & Abd Manan, T. S. (2024). Safety on Jordan's highways: A GIS-based approach to identifying road accident hotspots. *GeoJournal*, 89(3), 105. https://doi.org/10.1007/s10708-024-11115-5

Sae-Ngow, P., Kulpanich, N., Worachairungreung, M., Ngansakul, P., & Prasert, T. (2024). Geospatial analysis for identifying blackspots on national and rural highways in Thailand. *International Journal of Geoinformatics*, 20(4). https://doi.org/10.52939/ijg.v20i4.3147

Sirikup, N. (2016). *Factors determining Phuket's tourism economy (Master's thesis).* Sukhothai Thammathirat Open University, Thailand.

Sitthiyot, T. (2023). Income distribution in Thailand is scale-invariant. *PLoS ONE*, 18(7), e0288265. https://doi.org/10.1371/journal.pone.0288265

Tanaboriboon, Y., & Satiennam, T. (2005). *Traffic accidents in Thailand*. IATSS Research, 29(1), 88–100. https://doi.org/10.1016/S0386-1112(14)60122-9

Thailand Development Research Institute. (2017). *Road accidents – serious damage to the Thai economy. Bangkok.* Retrieved September 18, 2024, from https://tdri.or.th/2017/08/econ_traffic_accidents/

Tippayanate, N., Impool, T., Sujayanont, P., Muttitanon, W., Chemin, Y. H., & Som-Ard, J. (2024). Temporal analysis of road traffic accidents at major intersections in Khon Kaen Province, Thailand: A time series investigation from 2012 to 2021. *International Journal of Geoinformatics*, 20(7), 43–58. https://doi.org/10.52939/ijg.v20i7.3403

Vongurai, R. (2018). The influence of Thailand's image and foreign tourist satisfaction on foreign tourist loyalty for Thailand. *Thai Journal of East Asian Studies*, 22(2), 2-21.

Wu, P., Meng, X., & Song, L. (2021). Identification and spatiotemporal evolution analysis of high-risk crash spots in urban roads at the microzone-level: Using the space-time cube method. *Journal of Transportation Safety & Security*, 14(9), 1510–1530. https://doi.org/10.1080/19439962.2021.1938323

Article history: Received: 20.01.2025 Revised: 30.04.2025 Accepted: 27.05.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1078-1086
DOI 10.30892/gtg.602spl05-1481

PERCEPTIONS OF ACCESSIBLE TOURISM: AN ANALYSIS OF ATTITUDES AS A FUNCTION OF DIRECT CONTACT WITH PEOPLE WITH DISABILITIES IN ROMANIA

Blanka BÁLINT [1*]

[1] Sapientia Hungarian University of Transylvania, The Faculty of Economics, Socio-Human Sciences and Engineering, Department of Social Sciences, Miercurea-Ciuc, Romania; balintblanka@uni.sapientia.ro (B.B.)

Citation: Bálint, B. (2025). Perceptions of accessible tourism: An analysis of attitudes as a function of direct contact with people with disabilities in Romania. *Geojournal of Tourism and Geosites*, 60(2spl), 1078–1086. https://doi.org/10.30892/gtg.602spl05-1481

Abstract: Accessibility is a contemporary issue in tourism that requires knowing the perspectives of the majority of the population. People with disabilities encounter not only environmental and communication difficulties in tourism activities but also attitudinal barriers. According to contact theory, direct contact with people with disabilities (PwDs) is an effective way of promoting positive attitudes towards them. Based on this, this paper explores whether contact with PwDs influences the perception of accessible tourism among the Romanian population. This study used a quantitative approach, comprising an online, self-administered questionnaire survey of the adult population in Romania (N=1046). The respondents were selected using quota sampling and stratified by gender, age, region, and type of municipality. To increase the sample's representativeness, the results were weighted according to the primary socio-demographic variables (gender, age, type of municipality, and educational level) based on the latest available census data (as of 1 December 2021). The data was analysed using the statistical package SPSS version 22 for Windows. The results suggest that, although individuals with disabilities face considerable challenges in their leisure activities in Romania, the general population is often unaware of this unless they have someone with a disability among their family, friends, or close acquaintances. Those who do not interact with people with disabilities are less informed about the difficulties they encounter, whether in accessing tourism or dealing with other daily barriers. Furthermore, they are less likely to recognise the inadequate communication and treatment of people with disabilities. They are also less inclined to view the promotion of accessible tourism, including accessible routes and online collections, as essential compared to those who have contact with them. Direct contact is therefore essential, not only for gaining a better understanding of the situations and challenges faced by people with disabilities but also for diminishing attitudinal barriers. Following contact theory, the study emphasises the importance of direct contact in fostering social acceptance. This is particularly important in Romania, where the population is not fully aware of the need for accessibility, and negative social attitudes create an unavoidable barrier to accessible tourism.

Keywords: accessible tourism, attitudinal barriers, contact theory, disability, direct contact, PwDs, public opinion, Romanian population, social acceptance

* * * * * *

INTRODUCTION

Tourism rights apply equally to everyone; however, persons with disabilities face various barriers to participating in tourism activities. Attitudinal barriers are one of the three major obstacles to participation in tourism, indicating that the attitudes and behaviours of the majority of society represent a serious hurdle, in addition to environmental or communication barriers (Eichhorn & Buhalis, 2011). PwDs face hostile social attitudes that limit their participation in tourism (McKercher & Darcy, 2018). Tourists' reluctance to share common areas or complaints about PwDs also affects accommodation owners. Consequently, prejudices and discriminatory attitudes towards PwDs also affect the supply side, creating obstacles to the development of accessible tourism (Rubio-Escuderos et al., 2025). Therefore, the attitudinal barrier can represent a powerful social factor that hinders PwDs from participating in and enjoying social interactions (Guamán et al., 2023).

This is particularly important in Romania, where the primary barrier to tourism activities for families with children with disabilities is attitudinal, followed by physical barriers and a lack of information (Tecău et al., 2019). Simultaneously, research highlights the benefits of tourism for PwDs, including therapeutic, personal development, socialisation, and educational benefits, in addition to relaxation, recreation, and entertainment (Moura et al., 2023). PwDs regard tourism activities as the most important for self-development, self-esteem, and life satisfaction (Kastenholz et al., 2015; Yau et al., 2004). This highlights the importance of ensuring access to tourism for PwDs. Therefore, tourism must be inclusive, and researchers must endeavour to find ways to achieve this (Biddulph & Scheyvens, 2018).

Direct contact with PwDs serves as an excellent means to promote positive attitudes and reduce social prejudice. Contact theory can be persuasive, as getting to know PwDs better and discovering their positive characteristics can contribute to developing affirmative attitudes towards the entire group (Álvarez-Delgado et al., 2022). Consequently, contact enhances attitudes towards the external group member encountered and positively influences perceptions of the

* Corresponding author

group's perceptions of other groups (Boin et al., 2021). Engaging with people with disabilities also seriously shapes public opinion about individuals with disabilities (Wang et al., 2021). The research explored whether direct contact with PwDs affects the perception of accessible tourism among the Romanian population.

In addition to presenting a national sample of the Romanian population's views on accessible tourism, this study contributes to the growing literature on the topic by highlighting the importance of contacts in promoting the widespread acceptance of PwDs and accessible tourism, particularly in Romania, where the social and economic inclusion of PwDs is still not fully ensured (Grigoraș et al., 2021), negative social attitudes are the most considerable barriers to PwDs (Pașcalău-Vrabete & Băban, 2018), and low awareness of the need for accessibility is one of the main barriers to accessible tourism (Văduva et al., 2021). The article begins by defining disability and then describes the characteristics of accessible tourism. It further presents the barriers to tourism and the contact theory, before discussing methodological issues and the analysis results. The article concludes with final remarks.

LITERATURE REVIEW

Definition of disability

Disability is an evolving concept, making it challenging to define. The changing nature of disability is emphasised in the UN Convention on the Rights of Persons with Disabilities. It states, „Disability is an evolving concept and that disability results from the interaction between persons with impairments and attitudinal and environmental barriers that hinder their full and effective participation in society on an equal basis with others" (UN, 2007, Preamble, paragraph (e)). Disability is defined variably across different societies and cultures. Another feature of the definition is that it draws attention to the fact that, besides impairments, several other factors can prevent equal participation in society.

Similarly, the World Health Organisation's (2001) definition in the International Classification of Functioning, Disability and Health (ICF) recognises that the definition of disability may vary across cultures and disciplines. However, it stresses the importance of personal and environmental influences on this perception (Halmos, 2017). It defines disability as an umbrella term that includes impairments, activity limitations, and participation restrictions. Therefore, the importance of barriers is already reflected in the internationally accepted definitions of disability and is thus inevitable when examining the topic.

Accessible tourism

The first definition of accessible tourism was about overcoming disabling barriers and creating an enabling environment (Buhalis & Darcy, 2011). The current state of accessibility has been influenced by changing perceptions of disability, i.e., the spread of the social model of disability (Rubio-Escuderos et al., 2021), a theoretical framework that approaches disability not only as a problem inherent in individuals but also in their interaction with non-disabled people and the built environment. As the WHO (2001) definition of disability highlights, disability is only one of many factors that influence participation in everyday activities and life situations. Removing physical barriers to access only solves part of the problem, and accessible tourism is more than just an accessibility issue (Yau et al., 2004; Farkas et al., 2022). The concept is then united with the whole-life approach and universal design, which means designing products and environments as usable as possible for all people, without requiring adaptation or unique design (Darcy, 2006). The significance of universal design lies in the fact that accessibility is already at the heart of design and is not added for compliance purposes (Darcy & Dickinson, 2009). On this basis, „Accessible tourism enables people with access requirement (...) to function independently and with equity and dignity through the delivery of universally designed tourism products, services, and environment" (Darcy & Dickinson, 2009:7).

Barriers to tourism

The literature on PwDs' tourism activities highlights the numerous barriers to their participation in tourism, resulting in limited access to tourism opportunities. Several approaches to grouping these barriers have been proposed. Smith (1987), for example, distinguished three groups of barriers: intrinsic (lack of knowledge, health-related problems, social ineffectiveness, and physical and psychological dependency), environmental (attitudinal barriers, architectural barriers, ecological barriers, transportation barriers, and rules and regulation barriers), and interactive barriers (skill-challenge incongruities and communication barriers). As mentioned in the introduction, Eichhorn & Buhalis (2011) also distinguished three categories: physical access barriers, attitudinal barriers, and lack of information.

However, it is essential to note that PwDs do not form a homogeneous group, and not all obstacles affect them equally. At the same time, other barriers are specific to the group. Based on this, McKercher & Darcy (2018) propose decomposing constraints and grouping them into a four-tier framework. In their conceptual framework, the first tier encompasses the problems experienced by all tourists, while the second tier identifies the barriers shared by all PwDs, regardless of their specific disability. The last two levels focus on the specific types of disability and the associated impairments.

For this study, the common limitations, independent of disability, are the primary focus and are important because they build upon each other. Barriers found at lower levels must be removed before obstacles at higher levels can be addressed (McKercher & Darcy, 2018). Based on the literature, the authors distinguished five major groups: ignorance, attitudes, reliability of information, issues related to the tourism industry, and the person involved. The presented models all aim to draw attention to the limiting effect of negative attitudes. However, many studies have identified negative attitudes as a substantial problem (e.g., Guamán et al., 2023; Rubio-Escuderos et al., 2025). The contact theory's assumption that those interacting with PwDs have more positive attitudes toward the group may help reduce their biases.

The contact theory

Among the various theoretical approaches to interpreting and explaining discriminatory attitudes towards PwDs, the contact theory is one of the most prominent (Álvarez-Delgado et al., 2022). According to Allport's (1954) theory, contacts that foster knowledge and familiarity are likely to lead to stronger beliefs about minority groups, thereby reducing prejudice. Several meta-analyses supported the conclusion. For example, the work of Pettigrew & Tropp (2006), based on an analysis of 515 studies, demonstrates that intergroup contact can considerably reduce prejudice and that contact theory can be extended to other groups, such as PwDs. This theory is also excellent for research on sexism and gender inequality (Mikołajczak et al., 2025). The importance of contact in attitudes towards PwDs is also supported by Yuker's (1994) cumulative evaluation. His results indicate that beliefs, information, and relationships are key factors influencing attitudes. Thus, relationships are particularly effective in reducing prejudice towards people with intellectual or physical disabilities (Paluck et al., 2019). This has been demonstrated in research on attitudes towards employees with disabilities (Daruwalla & Darcy, 2005) and meta-analyses (e.g. Hernandez et al., 2002).

At the same time, several studies have been conducted among students, revealing considerable differences in perceptions of PwDs depending on the contact (e.g., Horner-Johnson et al., 2000; Polo Sánchez et al., 2021). Most research has, therefore, supported the theory; however, other studies have produced mixed results (e.g., Slininger et al., 2020). Slininger and his colleagues (2020) tested the theory among 9- to 10-year-olds and found evidence for it among boys, but not among girls. Although the contact theory was not proven, the authors acknowledge its validity.

Conversely, a meta-analysis by Armstrong and colleagues (2017) supports the effectiveness of contact interventions in improving children's attitudes towards disability. On the other hand, direct and indirect contact can trigger the bias-reducing effect of contact (Dole et al., 2025). Several studies have shown that prejudice was decreased not only by direct contact but also by a variety of indirect contact, such as imagined (Cocco et al., 2023; Ginevra et al., 2021; Plackowski, 2023), parasocial (Plackowski, 2023; Zhang & Haller, 2021), vicarious (Cocco et al., 2021) or online (Cocco et al., 2024) contact. In conclusion, over 70 years of research have demonstrated that intergroup contact plays a crucial role in fostering harmonious intergroup relations (Dole et al., 2025).

MATERIALS AND METHODS

Participants

The research participants were selected using a quota sampling procedure with Facebook ads targeted to strata based on gender, age, region and type of municipality. Participation in the research was voluntary. Since not enough people joined the research, participants were recruited from public Facebook groups associated with PwDs. As a result, PwDs and their relatives were overrepresented in the sample. To increase sample representativeness, the results were weighted according to the main socio-demographic variables based on the latest Romanian census data (as of 1 December 2021). After weighting, the distribution of the sample by gender, age groups, type of municipality, and educational attainment is similar to that of the Romanian population aged 15 and over (Table 1).

Table 1. Socio-demographic characteristics of the participants (Source: Author's calculations)

		N	Percent
Gender	male	497	48.0
	female	540	52.0
Settlement type	urban	544	52.5
	rural	493	47.5
Age groups	34 and younger	273	26.3
	35–64-year-olds	523	50.4
	65 and older	242	23.3
Education	low (less than primary, primary and lower secondary education)	298	28.7
	medium (upper secondary and post-secondary non-tertiary education)	540	52.1
	high (tertiary education, including postgraduate education)	199	19.2

Procedure

The data collection method was an online, self-administered questionnaire survey of the adult population in Romania. The data were collected by a market research and public opinion polling company between January 20 and February 21, 2024. One thousand forty-six respondents completed the questionnaire, with 834 answering it in full and 212 partially, but to a large extent. The underlying questionnaire was developed in the framework of an international collaboration involving researchers from four countries (Hungary, Croatia, Poland, and Romania). The answer to the question “Are there PwDs in your family, friends or close acquaintances?” approximated whether or not the respondent has direct contact with PwDs. If someone has PwDs in their family, friends, or close acquaintances, they are considered to have direct contact with PwDs; if not, they are considered to have no direct contact with PwDs. Although the answer to this question does not fully capture the concept of direct contact, it is considered a good approximation for this study.

Data Analysis

Data analysis was carried out using several methods. First, Kolmogorov-Smirnov with Lilliefors significance correction and Levene tests were carried out to determine the assumptions of normality and homoscedasticity. The result justified using the independent samples t-test to examine differences between respondents as a function of contact with PwDs. The effect size between the variables was tested using Cohen's d. Reliability testing (Cronbach's Alpha) was used to examine the coherence of statements in a category of questions. The associated items were aggregated by principal component analysis (PCA). The test of independence between categorical variables was performed with the Chi-square test. The effect size was tested using Cramer's V value in this case. The identification of latent variables was carried out using factor analysis (Maximum Likelihood). The rotation method was Varimax with Kaiser Normalization. In interpreting the results, Cronbach's alpha was also examined to determine whether the variables associated with a given factor interacted. The data was analysed using the statistical package SPSS version 22 for Windows.

RESULTS AND DISCUSSION

First, we examined the differences in perceptions of the various difficulties faced by PwDs as a function of contact. Respondents were asked to rate the different challenges on a scale of 1 to 7 (where one means "No difficulties at all," and seven indicates "Severe difficulties faced by PwDs"). Significant differences (independent samples t-test) were found in all cases: respondents with no contact with PwDs are less aware of the difficulties that PwDs face in their tourism activities than those with PwDs in their family, friends, or close acquaintances (see Table 2). This suggests that contact influences PwDs' perceptions of the difficulties associated with tourism.

Table 2. Means, standard deviations and the result of the independent sample t-test of perceptions about various difficulties faced by PwDs, as a function of contact with PwDs (Source: Author's calculations)

	Contact	N	M	SD	t	df	p
Use of rail transport	Yes	705	5.61	1.92	4.349	305.97	.000
	No	214	4.85	2.33			
Use of long-distance bus and coach transport	Yes	653	5.52	1.81	4.701	259.49	.000
	No	185	4.70	2.19			
Use of local public transport	Yes	633	5.26	1.87	4.627	266.07	.000
	No	188	4.41	2.30			
Use of accommodations	Yes	627	4.67	1.94	4.453	276.12	.000
	No	184	3.88	2.15			
Use of catering facilities (restaurants)	Yes	620	4.24	2.06	2.303	265.21	.022
	No	174	3.81	2.19			
Use of sports activities as a sports person	Yes	606	5.33	1.91	3.921	239.17	.000
	No	168	4.58	2.23			
Use of sports activities as a spectator	Yes	591	4.56	2.08	4.471	757	.000
	No	168	3.74	2.13			
Attending outdoor concerts and festivals	Yes	581	4.45	2.00	4.150	747	.000
	No	168	3.71	2.12			
Visiting tourist attractions	Yes	571	4.90	1.98	5.223	736	.000
	No	167	3.96	2.27			
Access to reliable information on effective accessibility	Yes	563	4.43	2.09	5.663	728	.000
	No	167	3.38	2.17			

The most considerable difference between the mean scores was found for *Access to reliable information on effective accessibility* (M_1-M_2 = 1.05), and *Visiting tourist attractions* (M_1-M_2 = *0.94*). The Cohen's d effect size indicator was also the highest here (d = 0.50 and d = 0.46). Followed by *Use of local public transport* (M_1-M_2 = 0.85), *Use of long-distance bus and coach transport* (M_1-M_2 = 0.83), and *Use of sports activities as a spectator* (M_1-M_2 = 0.82).

Cohen's d also indicated a medium-sized effect (d = 0.39–0.44) for these items. Nevertheless, for all the other factors listed, except *Use of catering facilities (*M_1-M_2 = 0.43*)*, where the effect between the two variables is low (d = 0.20), we found differences of more than 0.7 between the mean values as a function of contact, with medium impact (d = 0.36–0.39). This suggests that society does not fully recognise the barriers that PwDs face daily, despite the ongoing need for improvement in this area. For example, the participation of PwDs in sports activities is minimal, primarily due to individual efforts or private initiatives (Grigoraș et al., 2021).

The responses to the above ten items were combined using principal component analysis (PCA) to obtain the respondents' overall score. Internal consistency was checked using Cronbach's Alpha before aggregating the items for the difficulties. The resulting value (Cronbach's alpha .94) indicated excellent reliability, meaning the questionnaire items measured a consistent construct. Since omitting individual items does not increase the alpha, all items were included in the analysis. The resulting principal component reflects, to a large extent, the variability in responses to the original ten statements (total variance explained: 65.37%). The Principal Component expresses the aggregated perceptions of the various challenges faced by PwDs during their tourism activities (Table 3). Differences between the Principal Component values for difficulties along contact were also tested using an independent samples t-test, after checking for normality and homoscedasticity conditions (Kolmogorov-Smirnov with Lilliefors significance correction and Levene tests). The results further support the conclusion drawn above that direct contact determines the perception of the difficulties faced by PwDs. Those not in direct contact with PwDs do not perceive their challenges as severely as those who are in direct contact with them. For example, although access to tourist services is an essential, legally required fairness requirement, PwDs have limited access to many hotels and tourist attractions (Grigoraș et al., 2021). The results are significant (t(212.577) = 5.633, p = .000), with a Cohen's d value indicating a medium effect size (d = 0.58).

Table 3. Results of the Principal Component Analysis

	Communalities	**Factor loadings**
Use of rail transport	.666	.816
Use of long-distance bus and coach transport	.743	.862
Use of local public transport	.730	.854
Use of accommodations	.739	.860
Use of catering facilities (restaurants)	.546	.739
Use of sports activities as a sports person	.594	.771
Use of sports activities as a spectator	.694	.833
Attending outdoor concerts and festivals	.600	.775
Visiting tourist attractions	.688	.830
Access to reliable information on effective accessibility	.536	.732

Note. The KMO index value (0.916) indicated that the variables were suitable for factor analysis. The variables included in the study were not pairwise uncorrelated, and the Bartlett's test was significant (χ^2(45) = 6006.050, p < .001). The variables met the minimum criteria for factor analysis. The number of factors was determined using the Kaiser criterion (eigenvalues greater than 1).

In the following section, we looked at opinions on tourism participation opportunities. The opportunities for PwDs to participate in tourism are bad or unacceptably bad, according to a slight majority of respondents (51.8%). However, a substantial proportion of the population thinks they are neither bad nor good, and fewer than one-tenth think PwDs have good or excellent tourism participation opportunities (see Figure 1). Depending on the contact, we can see that those who have no contact with PwDs do not perceive the severity of the problem as much as those who have contact with them, even though research findings in Romania show that most PwDs (83%) not going on holiday (Grigoraș et al., 2021). The effect size measurement (Cramer's V = 0.2) shows a weak association between the two variables, but the results are statistically significant according to the Chi-Square test: $\chi^2(2, N=978) = 33.211$, $p < .001$). Thus, direct contact influences perceptions of opportunities for participation in tourism. Those who are closer to PwDs are more critical in this regard and recognise that access to tourism is not suitable for them.

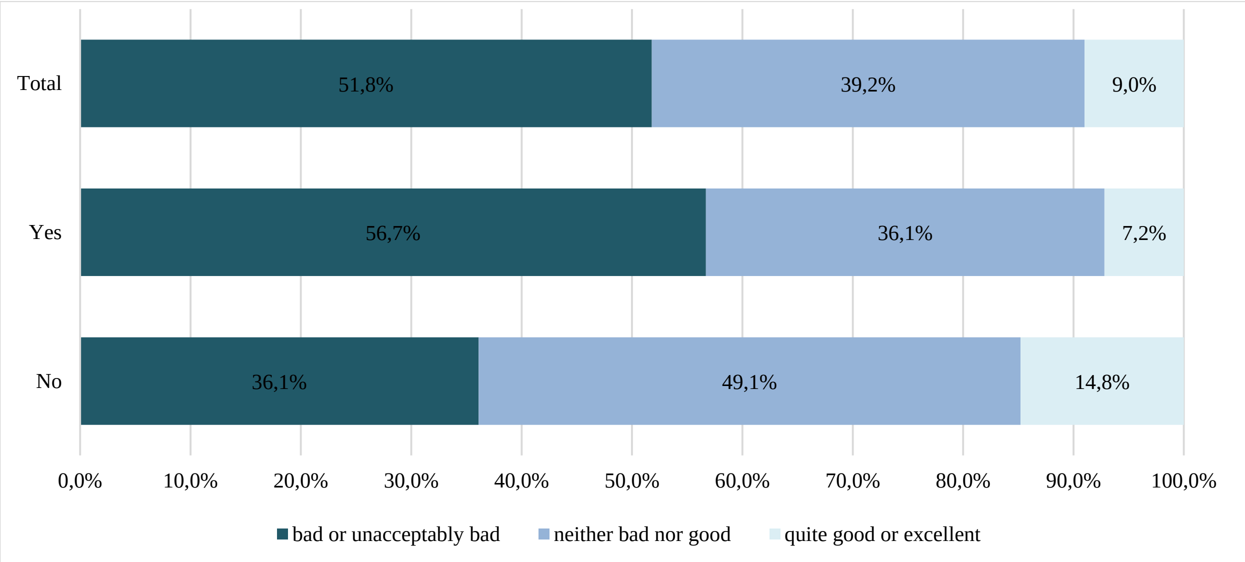


Figure 1. Opportunities for participation of PwDs in tourism as a function of contact with PwDs

Several statements were formulated to explore opinions on accessible tourism. Factor analysis was conducted using the Maximum Likelihood method to analyse common patterns. Based on the Kaiser criterion, we identified three factors explaining 72.61 percent of the total variance. The model fit is significant (χ^2(12) = 319.499, p < .001). The first factor was *Accessibility improvement* because, based on the factor loadings, it included statements that set expectations for the accessibility of tourism services. The second factor is called *Approach and communication*, as it encompasses not only the accessibility of communication but also the appropriate treatment of PwDs by both tourism workers and society. The third *Tourism promotion* factor includes aspects that would improve opportunities for PwDs to participate in tourism (Table 4).

Examining the results as a function of contact, based on the independent samples t-test we found significant differences for the second (t(172.471) = 2.128, p = .035) and third factors (t(681) = 1.955, p = .051).

Respondents who are in contact with PwDs rated appropriate communication and treatment of PwD, as well as promotion of tourism through accessibility and the creation of accessible tourist routes and online collections of it, as being more critical than those who were not in contact with them.

Table 4. Results of the Factor Analysis

	Factor loadings		
	1	2	3
Factor 1: Accessibility improvement			
Commercial accommodations should provide accessible places for people with disabilities.	.121	.150	**.854**
Catering establishments should also be more accessible for people with disabilities.	.202	.186	**.743**
Factor 2: Approach and communication			
Accessibility information should be more reliable for people with disabilities.	**.836**	.189	.075
In general, goodwill towards people with disabilities should improve.	**.952**	.134	.133
In general, respectful behaviour towards people with disabilities should be improved.	**.840**	.162	.206
In general, the attitude of tourism workers towards people with disabilities should be improved.	**.732**	.206	.151
Factor 3: Tourism promotion			
If trains and buses in my country were more wheelchair accessible, more people with disabilities would travel.	.225	**.665**	.176
If my country had hiking trails in park forests at least near cities, more people with disabilities would go hiking.	.172	**.931**	.165
If there were a reliable online collection of wheelchair accessible hiking trails, more people would choose to hike in nature.	.134	**.781**	.100

Note. The extraction method was Maximum Likelihood with an oblique (Varimax with Kaiser Normalization) rotation. The KMO index value (0.774) indicated that the variables were suitable for factor analysis. The variables included in the study were not pairwise uncorrelated, and Bartlett's test was significant ($\chi^2(36) = 4496.074$, $p < .001$). The variables meet the minimum criteria for factor analysis. The number of factors was determined using the Kaiser criterion (eigenvalues greater than 1). Factor loadings above .30 are in bold.

The contact also influences how respondents perceive programs as more suitable for PwDs. Indeed, programs that are not explicitly designed for PwDs but provide barrier-free access help to reduce discrimination against PwDs as opposed to programs that are designed expressly for them. They aim for social inclusion and do not treat disability-related characteristics as "special" but instead as one of the many types of disability in society (Zajadacz, 2015). At the same time, it is also the preferred choice for PwDs (Gonda, 2023). Respondents in contact with PwDs are aware of this, as they agree with this statement to a greater extent ($M = 5.45$) than those not in contact with them ($M = 4.79$). The difference between the two variables is significant according to the independent samples t-test: $t(779) = 3.824$, $p = .000$. (Again, opinions were recorded on a scale of 1 to 7, with one being "Strongly disagree" and seven being "Strongly agree".)

Finally, the results also show that contact with PwDs determines the perception of the relevance of developing accessible tourism, as it is considered more valuable ($M = 3.79$) by those who have contact with PwDs than by those who have no contact with them ($M = 3.42$), acknowledging ($M = 3.36$) that accessibility is not only beneficial for PwDs but also for themselves. Accessible tourism is no longer only for the benefit of PwDs but also for those who suffer from some form of disability, such as accident, surgery, pregnancy, overweight, or ageing (UNWTO, 2016; Gonda, 2021). Conversely, those who do not know PwDs are less likely ($M = 2.80$) to recognise that accessibility can benefit them. The differences are significant according to the independent samples t-test. Cohen's d value indicates a medium effect size ($d = 0.56$–0.58). The respondents are aware that Romanian society does not support social integration and inclusion (Figure 2). The opinion of those who are not in contact with PwDs is slightly more positive ($M = 2.47$) than that of those who have PwDs in their family, friends, or acquaintances ($M = 2.30$). According to Cohen's d effect size measure, the relationship is weak but statistically significant, as indicated by the t-test. So, contact also influences the perception of these issues.

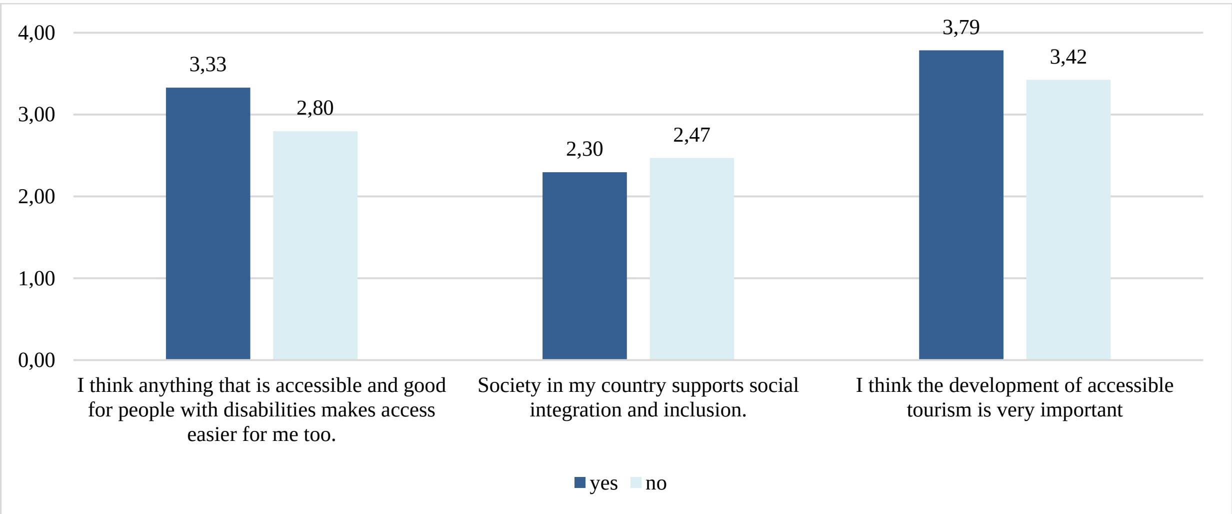


Figure 2. Differences in opinions on accessible tourism, based on contact with PwDs
(Mean values on a scale of 1 to 4, with one being "Fully disagree" and four being "Fully agree.")

In summary, we found a significant difference in most variables between respondents who had contact with people with disabilities and those who did not. Research on people with disabilities (e.g., Grigoraș et al., 2021) draws attention to the barriers that PwDs face in both their tourism activities (e.g., access to reliable information, use of accommodations, and visiting tourist attractions) and in their daily lives (e.g., public transport, use of restaurants, and sports activities). People with disabilities often have limited access to sports, leisure activities, and travel (Grigoraș et al., 2021).

Nevertheless, those who do not have contact with them do not consider these to be serious barriers. These are not meaningless when considering that over half (58%) of PwDs did not walk in green spaces or parks in the year before the survey, over four-fifths (85%) did not stay in hotels, guesthouses or other accommodation, a similar proportion (88%) did not play sports, and the vast majority (91%) did not assist in sporting events (Grigoraș et al., 2021).

Therefore, the opportunities for PwDs to participate in tourism are inadequate in the country, and the population is not even aware of them, unless they have PwDs in their families, friends or close acquaintances. In addition to physical barriers, there is room for improvement in treating PwDs, particularly in terms of respectful attitudes and overall goodwill. Still, these are most often perceived by those in contact with PwDs. Solutions that require relatively small investments, such as developing hiking trails near cities and creating a reliable online collection of these trails, but which would greatly facilitate the participation of PwDs in tourism, are less visible to those who are not in contact with them. At the same time, despite respondents with no contact with PwDs agreeing that the development of accessible tourism is essential, they perceive it less as a benefit for themselves. Many people are unaware that accessibility is decisive for PwDs and other groups, such as families with young children and older adults.

At some point, anyone can experience a loss of functionality and thus experience some form of disability (WHO, 2002). However, the number of PwDs increases with age in Romania as well (MMSS, 2023). In light of this, a substantial proportion of the population will experience disability to a lesser or greater extent throughout their lives. The boundary between PwDs and those without disability is, therefore, not as sharp as can be seen from the definitions presented in the theoretical part, and raising awareness of this among the Romanian population is an essential social agenda.

CONCLUSION

PwDs in Romania face serious challenges in their recreational activities, which are hampered not only by physical limitations but also by society's mentality. Nevertheless, the Romanian population is not aware of this unless they have a people with a disability in their family, friends or close acquaintances.

This study highlights the low level of public awareness of the difficulties faced by PwDs, many of which could be reduced by a more understanding and accepting attitude from society. This article has enriched the academic discourse on accessible tourism by drawing attention to the relevance of direct contact with PwDs in understanding and addressing the challenges faced by PwDs in tourism, and not only.

Much of the knowledge on reducing prejudice in the contact literature stems from studies on children or young adults, with a notable lack of research on prejudice in adults over 25 (Paluck et al., 2019). Thus, by broadening the subjects of the study, the present study also contributes to the contact literature. The empirical importance of this research lies in exploring the opinions of the adult population in Romania regarding tourism opportunities for PwDs.

Although we can find examples of surveys of population opinions in smaller areas, e.g., in Brașov (Brătucu et al., 2016) or around Timișoara (Babaita et al., 2011), to the best of our knowledge, no such survey has been conducted on a national sample in Romania. This further supports the empirical relevance of the research.

The analysis pinpoints the importance of contact with PwDs in fostering a more positive attitude. This is particularly relevant for creating accessible tourism opportunities, as it is a moral obligation and a legal requirement, since any barrier directly interferes with human rights (Krajinović & Čavlek, 2024). Therefore, we are responsible for reducing the obstacles to PwDs' participation in tourism, and not only. As such, this article contributes to the ongoing arguments that draw attention to the need to promote accessible tourism (Bordeianu, 2015) and the importance of achieving the related objectives, especially since in Romania, accessible tourism is still a rare reality (Rabontu, 2018; Nagy et al., 2025) and tourism services for PwDs are underdeveloped (Grigoraș et al., 2021).

Author Contributions: Conceptualisation, B.B.; methodology, B.B.; software, B.B.; validation, B.B.; formal analysis, B.B.; investigation, B.B.; data curation, B.B.; writing - original draft preparation, B.B.; writing - review and editing, B.B.; visualisation, B.B.; supervision, B.B.; project administration, B.B. The author has read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgements: This contribution presents some results from research on "The development of the innovative educational method of ACCESSIBLE tourism in Central Europe," funded by the Erasmus+ program of the European Union, project number 2022-2-HU01-KA220-HED-000099410.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Allport, G. W. (1954). *The nature of prejudice*. Addison-Wesley Pub. Co., Cambridge, Massachusetts, United States, 568 p.

Álvarez-Delgado, J., León-del-Barco, B., Polo-del-Río, M. I., Mendo-Lázaro, S., & Lopez-Ramos, V. M. (2022). Three intervention programs in secondary education on attitudes toward persons with a disability. *Frontiers in Psychology*, 13, 787936. https://doi.org/10.3389/fpsyg.2022.787936

Armstrong, M., Morris, C., Abraham, C., & Tarrant, M. (2017). Interventions utilising contact with people with disabilities to improve children's attitudes towards disability: A systematic review and meta-analysis. *Disability and health journal*, 10(1), 11–22. https://doi.org/10.1016/j.dhjo.2016.10.003

Babaita, C. M., Nagy A., & Filep, A. V. (2011). The tourism barriers of people with disabilities. *Annals of Faculty of Economics*, 1(special), 201-205.

Biddulph, R., & Scheyvens, R. (2018). Introducing inclusive tourism. *Tourism Geographies*, (20)4, 583–588. https://doi.org/ 10.1080/14616688.2018.1486880

Boin, J., Rupar, M., Graf, S., Neji, S., Spiegler, O., & Swart, H. (2021). The generalization of intergroup contact effects: Emerging research, policy relevance, and future directions. *Journal of Social Issues*, 77(1), 105-131. https://doi.org/10.1111/josi.12419

Bordeianu, O. M. (2015). Accessible tourism–a challenge for Romanian tourism. *Revista de turism-studii și cercetări în turism*, 20(2015), 42-49.

Brătucu, G., Chitu, I. B., Dinca, G., & Stefan, M. (2016). Opinions of tourists regarding the accessibility for people with disabilities in the area of Brasov County. *Bulletin of the Transilvania University of Brasov. Series V: Economic Sciences*, 73-82.

Buhalis, D., & Darcy (2011). Chapter 2 – conceptualising disability. In *Accessible tourism: Concepts and issues (pp. 21–44.)* Channel View Publications Bristol-Buffalo-Toronto.

Cocco, V. M., Lucarini, A., White, F. A., & Vezzali, L. (2024). Virtually meeting "The Intouchables": Online contact, sense of community, and prejudice toward people with a disability. *Journal of Applied Social Psychology*, 54(6), 332-343. https://doi. org/10.1111/jasp.13031

Cocco, V. M., Bisagno, E., Bernardo, G. A. D., Bicocchi, N., Calderara, S., Palazzi, A., Cucchiara, R., Zambonelli, F., Cadamuro, A., Stathi, S., Crisp, R., & Vezzali, L. (2023). Let's stay close: An examination of the effects of imagined contact on behavior toward children with disability. *Social Development*, *32*(3), 1042-1059. https://doi.org/10.1111/sode.12662

Cocco, V. M., Bisagno, E., Di Bernardo, G. A., Cadamuro, A., Riboldi, S. D., Crapolicchio, E., Trifiletti, E., Stathi, S., & Vezzali, L. (2021). Comparing story reading and video watching as two distinct forms of vicarious contact: An experimental intervention among elementary school children. *British Journal of Social Psychology*, *60*(1), 74-94. https://doi.org/10.1111/bjso.12404

Darcy, S. (2006). *Setting a research agenda for accessible tourism. Sustainable Tourism* CRC. Australia, 36 pages

Darcy, S., & Dickson, T. J. (2009). A whole-of-life approach to tourism: The case for accessible tourism experiences. *Journal of Hospitality and Tourism Management*, *16*(1), 32–44. https://doi.org/10.1375/jhtm.16.1.32

Daruwalla, P., & Darcy, S. (2005). Personal and societal attitudes to disability. *Annals of Tourism Research, 32*(3), 549-570. https://doi.org/10.1016/j.annals.2004.10.008

Dole, R. J., Cameron, L., & Abbott-Smith, K. (2025). Indirect Contact and Knowledge Interventions to Improve Relations in the Disabled-Nondisabled Intergroup Context: A Systematic Review. *Journal of Applied Social Psychology*. https://doi.org/ 10.1111/jasp.13084

Eichhorn, V., & Buhalis, D. (2011). Accessibility: A key objective for the tourism industry. *Accessible tourism: Concepts and issues*, *45*, 46-61, https://doi.org/10.21832/9781845411626-006

Farkas, J., Raffay, Z., & Petykó, C. (2022). A new approach to accessibility, disability and sustainability in tourism–multidisciplinary and philosophical dimensions. *Geojournal of Tourism and Geosites*, 40(1), 319-326. https://doi.org/10.30892/gtg.40138-834.

Ginevra, M. C., Vezzali, L., Camussi, E., Capozza, D., & Nota, L. (2021). Promoting positive attitudes toward peers with disabilities: The role of information and imagined contact. *Journal of Educational Psychology, 113*(6), 1269–1279. https://doi.org/10.1037/edu0000661

Gonda, T. (2021). Travelling habits of people with disabilities. *Geojournal of Tourism and Geosites*, 37(3), 844–850. https://doi.org/10. 30892/gtg.37315-717

Gonda, T. (2023). The importance of infrastructure in the development of accessible tourism. *Journal of Infrastructure, Policy and Development*, *8*(2), 2735. https://doi.org/10.24294/jipd.v8i2.2735

Grigoraș, V., Salazar M., Vladu C. I., & Briciu C. (2021). *Diagnoza situației persoanelor cu dizabilități în România [Diagnosis of the situation of people with disabilities in Romania]*, Ministerul Muncii și Protecției Sociale, București, Romania (in Romanian), 425 pages.

Guamán, A. R., Figueroa, C., Guamán-Guevara, F., & Núñez, J. L. (2023). Critical elements of disability models as determinants of travel intention of people with disabilities towards natural and cultural destinations. *Geo Journal of Tourism and Geosites*, *50*(4), 1240-1252. https://doi.org/10.30892/gtg.50404-1122

Halmos, S. (2017). *A fogyatékosság orvosi és társadalmi modelljének szintézise, különösen a munkajog területén [Synthesis of medical and social models of disability, particularly in the field of labour law]*. Doctoral Dissertation, Pázmány Péter University, Budapest, Hungary. (in Hungarian), 516 p.

Hernandez, B., Keys, C., & Balcazar, F. (2000). Employer attitudes toward workers with disabilities and their ADA employment rights: A literature review. *Journal of Rehabilitation-Washington*, 66(4), 4–16.

Horner-Johnson, W., Keys, C., Henry, D., Yamaki, K., Oi, F., Watanabe, K. H., Shimada, H., & Fugjimura, I. (2002). Attitudes of Japanese students toward people with intellectual disability. *Journal of Intellectual Disability Research*. 46(5), 365–378. https://doi.org/10.1046/j.1365-2788.2002.00406.x

Kastenholz, E., Eusébio, C., & Figueiredo, E. (2015). Contributions of tourism to social inclusion of persons with disability. *Disability & Society*, 30(8), 1259-1281. https://doi.org/10.1080/09687599.2015.1075868

Krajinović, V., & Čavlek, N. (2024). Accessible tourism in Croatia-State of the art and key challenges. In *FEB Zagreb 15th International Odyssey Conference on Economics and Business* (pp. 274-283).

McKercher, B., & Darcy, S. (2018). Re-conceptualizing barriers to travel by people with disabilities. *Tourism management perspectives*, 26, 59–66. https://doi.org/10.1016/j.tmp.2018.01.003

Ministerul Muncii și Solidarității Sociale (2024). Autoritatea Națională pentru Protecția Drepturilor Persoanelor cu Dizabilități. Date statistice 30 Septembrie 2024. [National Authority for the Protection of the Rights of Persons with Disabilities- Statistic Data 30 September 2024*] Bulletin statistic* 2024/3 (in Romanian).

Mikołajczak, G., Fisher, A. N., & Ryan, M. K. (2025). Intergroup contact in the context of gender. A critical review of the literature and opportunities for future research. *Group Processes & Intergroup Relations*. https://doi.org/10.1177/13684302241311544

Moura, A., Eusébio, C., & Devile, E. (2023). The 'why'and 'what for'of participation in tourism activities: travel motivations of people with disabilities. *Current Issues in Tourism*, 26(6), 941-957. https://doi.org/10.1080/13683500.2022.2044292

Nagy, B., Gergely, N., & Székely, E. (2025). Study on hotel infrastructure accessibility in Romania. Acta Turistica, 37 (Special Issue), 9-36. https://doi.org/10.22598/at/2023.37.SI.9

Paluck, E. L., Green, S. A., & Green, D. P. (2019). The contact hypothesis re-evaluated. *Behavioural Public Policy*, 3(2), 129–158. https://doi.org/10.1017/bpp.2018.25

Pașcalău-Vrabete, A., & Băban, A. (2018). Is 'different'still unacceptable? Exploring the experience of mobility disability within the Romanian social and built environment. *Disability & Society*, 33(10), 1601-1619. https://doi.org/10.1080/09687599.2018.1503592

Pettigrew, T. F., & Tropp, L. R. (2006). A meta-analytic test of intergroup contact theory. *Journal of personality and social psychology*, 90(5), 751. https://doi.org/10.1037/0022-3514.90.5.751

Plackowski, E. F. (2023). *"You should always be willing to listen and change" Using Brief Indirect Contact Interventions to Impact University Students' Ableism and Related Constructs and Conceptualizations*. Doctoral dissertation. Oregon State University, Corvallis, USA, 114 p.

Polo Sánchez, M. T., Chacón-López, H., Caurcel Cara, M. J., & Valenzuela Zambrano, B. (2021). Attitudes towards persons with disabilities by educational science students: importance of contact, its frequency and the type of disability. *International Journal of Disability, Development and Education*, 68(5), 617-626. https://doi.org/10.1080/1034912X.2020.1716960

Rabontu, C. I. (2018). The accessibility of persons with disabilities in Romanian tourism. *Revista de turism-studii si cercetari in turism*, (25).

Rubio-Escuderos, L., de la Rosa, F. J. U., & García-Andreu, H. (2025). What is stopping the process? Analysis of obstacles to accessible tourism from a stakeholders' perspective. *Journal of Destination Marketing & Management*, *36*, 100879. https://doi.org/10.1016/j.jdmm.2024.100879

Rubio-Escuderos, L., García-Andreu, H., & de La Ros, J. U. (2021). Accessible tourism: origins, state of the art and future lines of research. *European Journal of Tourism Research*, 28, 2803-2803. https://doi.org/10.54055/ejtr.v28i.2237

Slininger, D., Sherrill, C., & Jankowski, C. M. (2000). Children's attitudes toward peers with severe disabilities: Revisiting contact theory. *Adapted physical activity quarterly*, *17*(2), 176–196. https://doi.org/10.1123/apaq.17.2.176

Smith, R. (1987). Leisure of tourist with a disability: Barriers to travel. *Annals of Tourism Research*, *14*(3), 376–389.

Tecău, A. S., Brătucu, G., Tescașiu, B., Chițu, I. B., Constantin, C. P., & Foris, D. (2019). Responsible tourism—integrating families with disabled children in tourist destinations. *Sustainability*, 11(16), 4420. https://doi.org/10.3390/su11164420

United Nations (2007). *Convention on the Rights of Persons with Disabilities*. United Nations, 31 p.

UNWTO (2016). *Manual on Accessible Tourism for All: Principles, Tools and Best Practices*. UNWTO Publications. 68 p.

Văduva, L., Petroman, C., Marin. D., & Petroman I. (2021). Accessible tourism. *Agricultural Management/Lucrari Stiintifice Seria I, Management Agricol*, 23(1).

Zajadacz, A. (2015). Evolution of models of disability as a basis for further policy changes in accessible tourism. *Journal of Tourism Futures*, *1*(3), 189–202. https://doi.org/10.1108/JTF-04-2015-0015

Wang, Z., Xu, X., Han, Q., Chen, Y., Jiang, J., & Ni, G. X. (2021). Factors associated with public attitudes towards persons with disabilities: a systematic review. *BMC public health*, 21(1), 1058. https://doi.org/10.1186/s12889-021-11139-3

World Health Organization (2002) *Towards a Common Language for Functioning, Disability and Health ICF*. World Health Organization, Geneva, Switzerland, 22 p.

World Health Organization (2001). *International Classification of Functioning, Disability and Health.* World Health Organization, Geneva, Switzerland, 311 p.

Zhang, L., & Haller, B. (2021). Parasocial contact effects and a disabled actor in Speechless. In M. S. Jeffress (ed.), *Disability Representation in Film, TV, and Print Media, 10–23,* Routledge, London. https://doi.org/10.4324/9781003035114

Yau, M. K., McKercher, B., & Packer, T. L. (2004). Traveling with a disability: More than an access issue. *Annals of tourism research*, 31(4), 946-960. https://doi.org/10.1016/j.annals.2004.03.007

Yuker, H. E. (1994). Variables that influence attitudes toward persons with disabilities: Conclusions from the data. *Journal of Social Behavior and Personality*, 9(5), 3.

Article history: Received: 20.01.2025 Revised: 05.05.2025 Accepted: 28.05.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1087-1096
DOI 10.30892/gtg.602spl06-1482

GLOBAL TRENDS IN TOURISM SCALE CHANGE IN THE 21ST CENTURY

Andrea SZŐLLŐS-TÓTH [1], Sándor KOVÁCS [2], Anetta MÜLLER [3*], Levente NÁDASI [4]

[1] University of Debrecen, Faculty of Economics and Business, Doctoral School of Management and Business, Debrecen, Hungary; toth.andrea@econ.unideb.hu (A.S.T.)
[2] University of Debrecen, Faculty of Economics and Business, Coordination and Research Centre for Social Sciences, Debrecen, Hungary; kovacs.sandor@econ.unideb.hu (S.K.)
[3] University of Debrecen, Faculty of Economic Sciences, Institute of Sports Economics and Management, Debrecen, Hungary; muller.anetta@econ.unideb.hu (A.M.)
[4] University of Debrecen, Faculty of Economics and Business, Institute of Economics, Debrecen, Hungary; nadasi.levente@econ.unideb.hu (L.N.)

Citation: Szőllős-Tóth, A., Kovács, S., Müller, A., & Nádasi, L. (2025). Global trends in tourism scale change in the 21st century. *Geojournal of Tourism and Geosites*, 60(2spl), 1087–1096. https://doi.org/10.30892/gtg.602spl06-1482

Abstract: This study aims to identify the settlements most significantly impacted by tourism globally and analyze the underlying reasons behind these trends. By examining 255 locations worldwide, the research provides insights into the territorial distribution of tourism activities and their evolution over time. Given the rapid transformations in global travel patterns due to economic, environmental, and technological changes, understanding these dynamics is crucial for sustainable tourism planning and destination management. The analysis employs advanced statistical techniques, including Variable Clustering (VARCLUS), Principal Component Analysis (PCA), and Factor Analysis of Mixed Data (FAMD), to evaluate the rankings and sub-indicators of the studied locations. These methods allow for a detailed examination of regional and typological patterns, integrating continuous and categorical data to create a comprehensive map of tourism-affected areas. The findings reveal significant regional and typological patterns in global tourism. European coastal and heritage sites are predominantly influenced by international tourism indicators, while North American and Asian urban areas exhibit a stronger reliance on domestic tourism indicators. The study highlights the dominance of certain factors shaping tourism dynamics and offers insights into the varying nature of tourism impacts across regions. The research provides actionable recommendations for policymakers and economic stakeholders to develop more effective regulatory and economic strategies. By addressing the distinct needs of different regions, the study contributes to a better understanding of tourism's evolving scale and offers a foundation for targeted policy interventions. The study separates the problems caused by domestic and international visitors, which is important for economic policy. In places like Venice and Dubrovnik in Europe, which are popular with tourists, higher prices and taxes could help to control tourism and fund efforts to protect the environment. In North America and Asia, planning for cities and managing infrastructure are important to balance tourism growth with the quality of life for locals.

Keywords: overtourism, urban tourism, sustainability, ranking, tourism destinations, VARCLUS method, Principal Component Analysis (PCA)

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INTRODUCTION

The growth of tourism is accompanied by an increased risk of excessive tourist traffic, which has a negative impact on the quality of life of the local population (Smeral, 2019; Doxey, 1975; Postma & Schmuecker, 2017). Congestion, noise pollution and traffic problems all contribute to local dissatisfaction. Furthermore, the environmental damage caused by tourists, such as litter and overuse of resources, is a major concern for cities (Nilsson, 2020; Sadeghian, 2019; Anup, 2018).

Another contemporary issue that has emerged alongside the expansion of tourism is the rise of Airbnb and similar platforms, which have had significant impact on the accommodation market (Celata & Romano, 2020; Calle-Vaquero et al., 2021). Airbnb's economic impact on the tourism industry has positioned it as a significant competitor to the traditional hotel industry (Oskam & Boswijk, 2016; Zmyślony et al., 2020). Such platforms often fail to comply with relevant local regulations, which can lead to an increase in property prices and the displacement of local residents. The increase in short-term rentals has led to a corresponding decrease in long-term rentals in many urban centres, exacerbating the housing crisis to the detriment of local residents (Nilsson, 2020).

There is a direct and statistically significant relationship between house price growth and the likelihood of overtourism in residential areas, as shown by Such-Devesa et al. (2020) using two major Spanish cities (Madrid, Barcelona) as examples. In the context of sustainable tourism development in municipalities, the satisfaction of the local population must be given the highest priority (Oka et al., 2021; Goodwin, 2017), as otherwise conflicts may rise.

In essence, there are many market failures in the tourism sector, making regulation and strategic management essential for sustainability. Society and the environment, rather than tourists or service providers, bear the costs of

* Corresponding author

negative externalities such as pollution, overcrowding, and overburdened infrastructure. If everyone has unrestricted access to public goods like beaches and monuments without contributing to their maintenance, excessive use can lead to degradation, a phenomenon known as the tragedy of the commons.

This issue is exacerbated by the lack of information available to tourists, who often remain unaware of the environmental impact of their travel choices or the sustainability of the destinations they visit. Furthermore, in certain segments of the tourism market -such as airlines, online booking platforms, and major hotel chains - monopolies and oligopolies can emerge, leading to reduced competition and potentially higher prices for consumers. Additionally, short-term rental platforms can contribute to housing crises in major tourist hubs, driving up rental prices and displacing local residents. Given these challenges, strong government regulation is necessary to balance economic benefits with social and environmental sustainability. Comprehensive analysis and performance rankings of tourism destinations can provide valuable insights, guiding policymakers in creating more sustainable and equitable tourism policies.

LITERATURE REVIEW

The high level of interest in certain destinations often leads to overcrowding of tourists, a phenomenon commonly referred to as overtourism (Remenyik et al., 2021). Overtourism refers to destinations where local people/guests perceive that the quality of life or experience in the area has deteriorated unacceptably due to the high number of tourists (Goodwin, 2016). A review of the international literature on the subject reveals that overtourism can be defined as a phenomenon of tourism and the presence of tourists to an extent that negatively affects and irritates the parties involved (locals and visitors or tourists) and contributes to conflicts and disagreements between them.

In the early years following the emergence of the overtourism phenomenon, these challenging issues seemed to be of greater concern to smaller destinations. The rationale was that the tourism industry was unable to cope with the increasing demand due to constraints on its carrying capacity. It was assumed that larger cities were better equipped to handle large crowds (mass tourism) and, consequently, overtourism was not considered to be a significant issue in their case (Bouchon & Rauscher, 2019). There is a notable lack of accurate statistical indicators to measure rural tourism. In many cases, evidence of excessive tourist interest in a particular area can be identified by the opposition expressed by local residents. It is clear that rural tourism accounts for a relatively small share of the total GDP generated by tourism, with tourist arrivals remaining significantly lower than those in large cities.

However, many villages threatened by overtourism still receive a significant number of visitors relative to their local population. A variety of attractions can attract tourists to these locations, including fishing villages – Corfu, Greece (Goodwin, 2016), traditional events – Venice, Italy (Visentin & Bertocchi, 2019), Christmas fairs – Meran, Italy (Brida et al., 2016) , film locations – Matamata, New Zealand (Zhang & Ryan, 2022), and places that have inspired films – Hallstatt, Austria (The New York Times, 17.01.2020,3), special natural treasures – Cinque Terre, Italy (Vegnuti, 2020), and unique architectural heritage – Mont Saint-Michel, France (Forbes, 25.06.2023, 1).

However, in the second half of the 2010s, based on the results of various studies (Peeters et al., 2018; Popescu et al., 2023; Amore et al., 2020; Nádasi et al., 2024; Smith et al., 2021), it became clear that urban destinations also faced a significant challenge of overtourism, which refers to an unsustainable level of tourism (Bouchon & Rauscher, 2019). Consequently, a range of studies are being conducted on the phenomenon of overtourism in both small destinations (Krajickova et al., 2022) and urban destinations (Dodds & Butler, 2024; Jover Báez & Díaz Parra, 2022).

Infrastructure in rural destinations is limited, employment opportunities are restricted, the economy is rapidly becoming one-sidedly dependent on tourism, and the supply of real estate is low (Drápela, 2023). These factors indicate that price rises will have a disproportionately negative effect on the local population. The issue of increasing house prices is further complicating by the increasing popularity of short-term rentals, which has led to a situation where local residents are unable to purchase homes or rent long-term properties due to the high cost (Gyódi, 2023; Smigiel, 2023). Congestion, infrastructure overload, increasing pressure on the environment, over-dependence on tourism, and rising house prices are all problems felt in both rural and urban destinations.

Wall (2020) confirmed that the phenomenon of overtourism is not a new, as a similar process has already been initiated. The author pointed to the example of American national parks, where carrying capacity assessment has a long-standing and well-documented history. It is relatively unusual in academic circles for experts to undertake comprehensive statistical analyses of tourism in urban areas around the world. Much of the research in this area was focused on specific countries or continents. Van Truong & Daisuke (2022) presented a study focusing on the phenomenon of overtourism in 12 European and 16 Asian cities that reported overtourism. The study used a combination of qualitative and quantitative indicators, including tourist density, tourism intensity, seasonal distribution of tourists, day-night distribution of tourists, and occupancy of accommodation facilities, to examine the impact of tourism on urban areas. A ranking was developed by comparing the excessive degree of overtourism and policy stringency. This ranking revealed that the group with a very excessive degree of tourists and high policy strictness consists of Dubrovnik, Venice, and Biei-cho.

In 2018, the UNWTO presented 11 strategies for the management of visitor flows to urban destinations. These strategies included dispersing tourists within cities, reducing seasonality, introducing new attractions, and the strengthening of communication with local residents and tourists.

In their 2022 study, Bąk and Brelik used a ranking system to assess the tourism function, level of development, intensity of tourism flows, and development of tourism in EU countries. The following indicators were used: The Defert index, which measures the number of beds per 100 permanent inhabitants, the Schneider index, which measures the number of nights per 100 permanent inhabitants, the Charvat index, which measures the number of nights per 100 permanent inhabitants, and the accommodation capacity utilisation rate, which measures the number of days spent per accommodation unit during the year; the accommodation development index, which is calculated as the ratio between the number of tourists and the number of beds; the tourism density index, which shows the number of tourists per km²; the accommodation density index, which shows the number of beds per 1 km² in the country. The analysis of the period between 2000 and 2019 showed that Cyprus and Malta were the most tourism-oriented countries. The authors also highlighted Hungary's rise in the ranking from 2000 to 2019. The change in ranking reflects not only the development of tourism infrastructure but also the high interest of tourists in the destinations concerned.

The tourism sector has also undergone a number of major changes in recent years, one of the main reasons being the COVID-19 crisis and the subsequent recovery process (Cehan & Iaţu, 2024; Stupariu et al., 2023). During the pandemic, tourism experienced an unprecedented low point, with the number of people employed in the industry dropping dramatically along with the number of tourists (Tomčíková et al., 2021; Pahrudin et al., 2022). Some communities recovered quickly, while others were slower to rebuild their economies (Rogerson & Rogerson, 2021). Among the many changes during the pandemic, it is important to note the shift in focus of tourists' travel preferences. Whereas previously the bucket list destinations were the most popular (e.g. sites visited by influencers (Tomazos, 2022)), the epidemic has led to an increase in the popularity of rural destinations, with certain regions experiencing a state of near overtourism as a result of increased presence of tourists (Steber & Mayer, 2024).

All this justifies the need for further time series analysis of tourism at the global level. A series of analyses have been carried out, distinguishing the municipalities under study according to whether they are overtourism sites, and, if so, the specific category of overtourism site to which they belong. This categorisation is based on the work of Peeters et al. (2018), who have enumerated the overtourism sites that have been identified on a global scale.

In the quantitative assessment of overtourism, tourism intensity and tourism density were the most commonly used metrics. As defined by Van Truong & Daisuke (2022), tourist intensity is the average number of tourists that a resident passively “receives” in a year. Tourism density is a geographical measure of the number of tourists per square kilometre (Manera & Valle, 2018). By using population-based and area-based indices, the research employed a methodology analogous to that of the tourism intensity and density indices. It is clear that such indicators were used in a similar way by other authors, for example, accommodation density (Simancas & Peñarrubia, 2019).

This study aims to identify the settlements most affected by tourism on a global scale and explore the factors driving these patterns. By analyzing various locations worldwide, the research offers insights into the spatial distribution of tourism activities and their changes over time. As global travel patterns continue to evolve due to economic, environmental, and technological shifts, understanding these dynamics is essential for sustainable tourism development and effective destination management. This study also aims to provide practical insights that support tourism professionals and policymakers in making informed decisions. By understanding the spatial distribution and driving forces of tourism, the research contributes to the development of strategies that promote sustainable destination management and responsible tourism practices.

MATERIALS AND METHODS

In the first stage of the analysis, variable clustering (VARCLUS) (Vigneau & Qannari, 2003) was employed to eliminate redundant dimensions and represent the data in a lower-dimensional space. The method is closely related to both principal component analysis and cluster analysis. The algorithm identifies groups of variables that exhibit the greatest possible correlation with one another and the least possible correlation with variables in other clusters. The objective of the procedure is to create latent components (optimal representatives) for each correlated set of variables as linear combinations of the given variables. The procedure initially uses a K-means (agglomerative) cluster analysis for an initial grouping, after which latent components are assigned to each cluster. In the final stage, new clusters are formed on the basis of the squared Pearson correlation coefficient between the variables and the latent component. The procedure is iterative and ends when the cluster structure has reached a state of stability.

The aggregation strategy is based on the observed variances and the merging of two clusters depends on the minimum decrease of the total explained variance after the aggregation. A major advantage of a VARCLUS over a simple Principal Component Analysis (PCA) is that the resulting structure is clearer and easier to interprete. Furthermore, Kruskal-Wallis analysis was applied to the latent components formed by VARCLUS in order to detect differences in latent component scores with regard to region, location, and type of overtourism. In addition, the authors attempted to develop a single, general index of overtourism that included all the variables studied. To this end, the authors also applied a simple PCA and formed a single principal component from all the overtourism indices.

In the second stage of the analysis, the factor analysis of mixed data (FAMD) technique (Pagès & Pagès, 2014) was used to create a map representing the locations together with both continuous and categorical data. The continuous data included international and domestic overnight visits, international and domestic nights in paid accommodation, and international and domestic travel spends. The categorical data included region: The regions of Africa, Asia, Australia, Europe, and North and South America were considered, as well as the type of overtourism, such as coastal, heritage, urban, and not-exposed. The map thus serves to highlight and summarise all the relationships that exist within the data set. All calculations were performed using the R 4.2.3 software (2023-03-15) (R Core Team, 2023).

All figures were created using R Studio 2022.02.2 (Build 485) and subsequently enhanced using Inkscape 1.0.1, a vectorised image editor. The FAMD was performed using the FactoMineR package. See Figure 1 for a summary of the methodology of primary and secondary research.

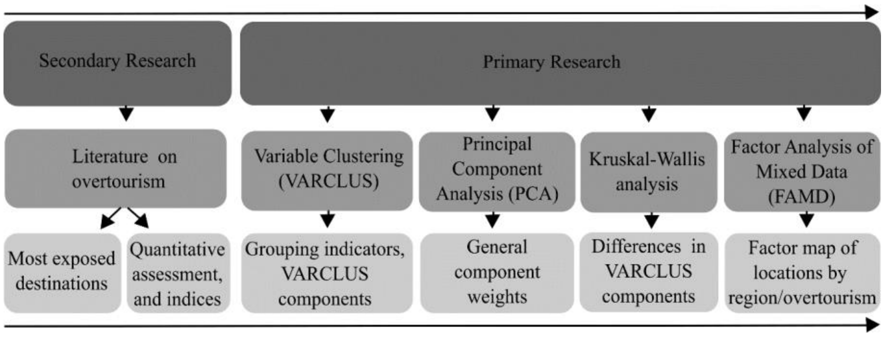

Figure 1. Flow chart of the methododlogy (Source: Authors)

RESULTS AND DISCUSSION

The VARCLUS method was applied with the objective of determining the clusters of the studied overtourism indicators and of forming latent components for each cluster, with the aim of reducing the dimensionality of the data. The VARCLUS method is a more practical approach to clustering overtourism indices, as it allows for the selection of the most correlated measures and the creation of subgroups and latent components from them. The initial cluster is subdivided into five distinct clusters, each comprising two or three indicators (Figure 2).

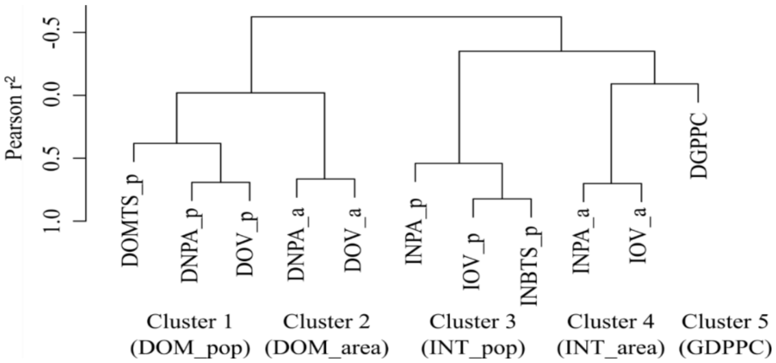

Figure 2. Cluster and correlation structure of the overtourism indicators (Source: Authors)

Note: Area based indices are denoted by „_a", population based indices are denoted by „_p". DNPA: Domestic Nights in Paid Accomodation; INPA: International Nights in Paid Accomodation; DOV: Domestic Overnight Visits; IOV: International Overnight Visits; DOMTS: Domestic Travel Spends; INBTS: Inbound Travel Spends; GDPPC: GDP per capita

Figure 2 illustrates the five clusters identified as exhibiting characteristics of overtourism. Domestic indices were calculated using area and population data and included in the first and second clusters. The third and fourth clusters comprise international indicators based on area and population. The final cluster comprises solely GDP per capita. The Pearson r-squared measure provides an indication of the degree of correlation between the indicators within a given cluster and the cluster's underlying latent component. Table 1 illustrates the five clusters and the correlation of each indicator with the cluster's latent component.

Table 1. Correlations of indicators with their own and next closest clusters, and general component weights (Source: Authors)

Cluster (explained variance%)***	Type of claculation	Indicators	Abbreviation	$r^2_{(OWN)}$	$r^2_{(CLOSEST)}$	1-r^2 ratio*	General component weights**
DOM_pop (82%)	Population based	Domestic Nights in Paid Accomodation	DNPA_p	0.897	0.304	0.149	0.741
		Domestic Overnight Visits	DOV_p	0.820	0.364	0.284	0.674
		Domestic Travel Spends (Million US dollars)	DOMTS_p	0.731	0.212	0.341	0.729
DOM_area (91%)	Area based	Domestic Nights in Paid Accomodation	DNPA_a	0.908	0.318	0.135	0.679
		Domestic Overnight Visits	DOV_a	0.908	0.330	0.138	0.671
INT_pop (88%)	Population based	International Nights in Paid Accomodation	INPA_p	0.810	0.035	0.197	0.516
		International Overnight Visits	IOV_p	0.915	0.199	0.106	0.629
		Inbound Travel Spend (Million US dollars)	INBTS_p	0.908	0.097	0.102	0.546
INT_area (92%)	Area based	International Nights in Paid Accomodation	INPA_a	0.919	0.156	0.097	0.567
		International Overnight Visits	IOV_a	0.919	0.133	0.094	0.570
GDPPC (100%)		GDP per capita (Billion US dollars)	GDPPC	1.000	0.047	0.000	0.262

*: 1- r^2 ratio is calculated according to formula (1), **: general component weights were calculated by PCA analysis, ***: Overall explained variance = 89%.

The method serves to identify the variables that have been assigned to each cluster. Furthermore, the indicators are selected for a given cluster in a manner that ensures the highest correlation with their own cluster $r^2_{(OWN)}$ and the lowest correlation with the closest clusters $r^2_{(CLOSEST)}$.

The 1 - r^2 ratio is calculated as follows (SAS Institute Inc., 2013):

$$1 - r^2\ ratio = \frac{1 - Pearson\ r^2_{(OWN)}}{1 - Pearson\ r^2_{(CLOSEST)}} \quad (1)$$

A given indicator is strongly correlated with its own cluster ($r^2_{(OWN)} \rightarrow 1$) and uncorrelated with the closest cluster ($r^2_{(CLOSEST)} \rightarrow 0$), thus the 1-$r^2$ ratio is close to 0 (Sanche & Lonergan, 2006).

Therefore, an indicator with the lowest 1 - r^2 value is likely to be the most representative for the cluster. The explanatory power of the clusters is considerable. The area-based clusters demonstrate relatively high proportions of variance explained, with 91% for domestic indicators and 92% for international indicators, respectively. The proportions of variance explained in the population-based clusters are comparatively lower, at 82% for domestic indicators and 88% for international indicators, respectively. In total, the latent components account for 89% of the variance. The correlation coefficients for each indicator exceed 0.7, indicating a stronger correlation with its corresponding latent component. The domestic indicators are related to the general overtourism indicator with a relatively larger weight. The population-based domestic nights in paid accommodations and domestic travel spending have the largest weights, with correlation coefficients of 0.741 and 0.729, respectively. The lowest weight (0.262) is attributed to GDP per capita on the general component. The VARCLUS clustering results yielded five synthetic components, created according to the given indicator clusters. Consequently, each VARCLUS component represents a distinct cluster of indicators with a single score. These components are more disparate and easier to interpret than the rotated principal components, which is the primary advantage of the VARCLUS method.

Figure 3. examines the pattern of overtourism in different locations by calculating the average VARCLUS component scores for each group. In coastal areas and islands, international population-based indicators are high, as well as the general overtourism component. However, the other indicators have lower values. In urban areas, GDP per capita is higher, and the general overtourism component and international area-based indicators are the highest. In the case of heritage and attraction sites, the international indicators are relatively modest, while the domestic indicators are the lowest. The Kruskal-Wallis analysis revealed a statistically significant difference for all studied indicators at the 5% significance level.

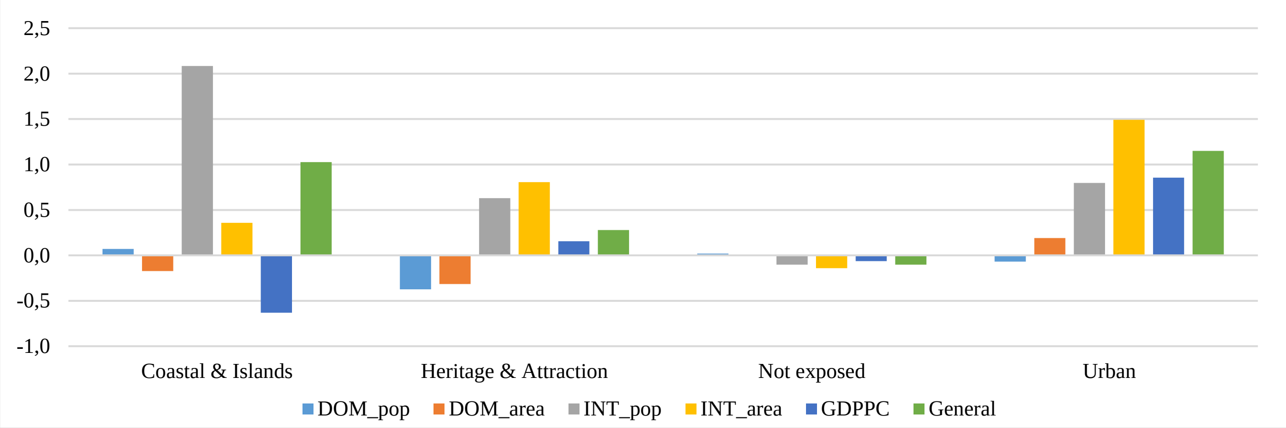

Figure 3. Differences in VARCLUS components by the type of overtourism. (Source: Authors)

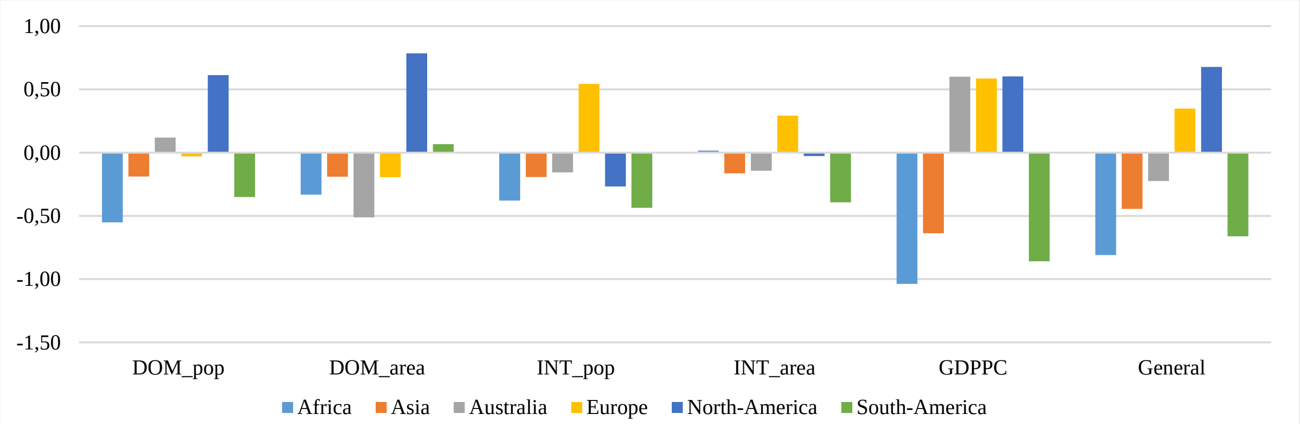

Figure 4. Differences in VARCLUS components by region. (Source: Authors)

Figure 4 illustrates the mean VARCLUS component scores for each region. In particular, North America exhibits relatively high domestic indicators, including area- and population-based metrics, as well as GDP per capita. However, other indicators display lower values. In Europe, locations with higher GDP per capita tend to demonstrate the highest international population-based indicators and a notable general component, largely due to coastal and heritage locations. Heritage and attraction sites exhibit modest international indicators, while domestic indicators remain low. The Kruskal-Wallis analysis revealed a statistically significant difference for all studied indicators at the 5% significance level.

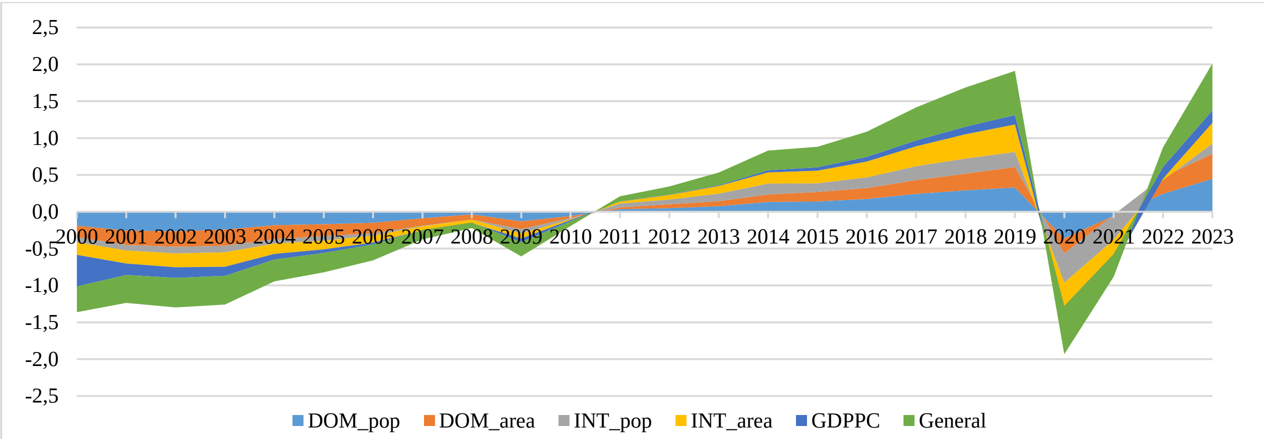

Figure 5. Development of VARCLUS components by year. (Source: Authors)

There is a consistent upward trend in all indicator groups until 2019, when a sudden shift occurs due to the impact of the global pandemic (Figure 5). It is evident that following the pandemic, international tourism recovers from the initial shock and resumes its pre-crisis trend. Figure 6 and 7 presents the results from the FAMD and highlight the main relationships within the data set from different viewpoints (with respect to region and type of overtourism).

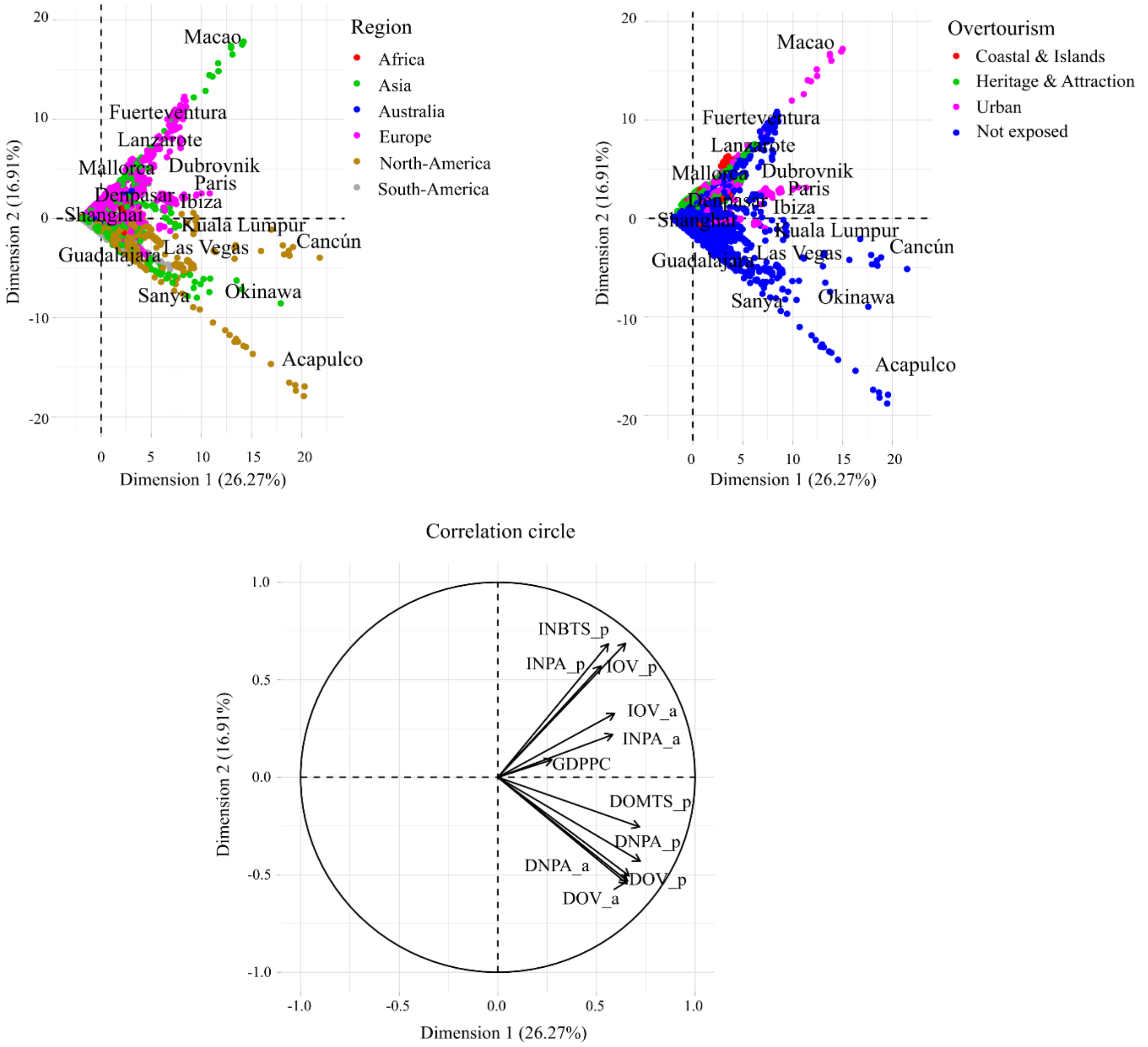

Figure 6. Correlation circle and factor map (dimension 1 and 2) of the locations by region and type of overtourism. (Source: Authors)

The first two dimensions accounted for 43.2% of the total variance (Figure 6). The first dimension accounts for the largest proportion of the variance (26.27%) and can be interpreted as a tourism intensity index. This is due to its relationship with both international and domestic indicators, which are based on area and population data. The second dimension separates the international indicators, which are located in the first quadrant, from the domestic indicators, which are located in the fourth quadrant. As illustrated in the factor map, the first quadrant comprises a significant number of European destinations, including Mallorca, Lanzarote, Fuerteventura, Dubrovnik, Paris and Ibiza. Additionally, it features several Asian locations, such as Macao, Denpasar and Shanghai. These are primarily heritage, urban and coastal types. These locations are most affected by high international interest. The fourth quadrant comprises North and South American locations (Acapulco, Cancún, Guadalajara, Las Vegas) and some Asian locations (Kuala Lumpur, Sanya, Okinawa) with higher domestic interest and less exposure to overtourism.

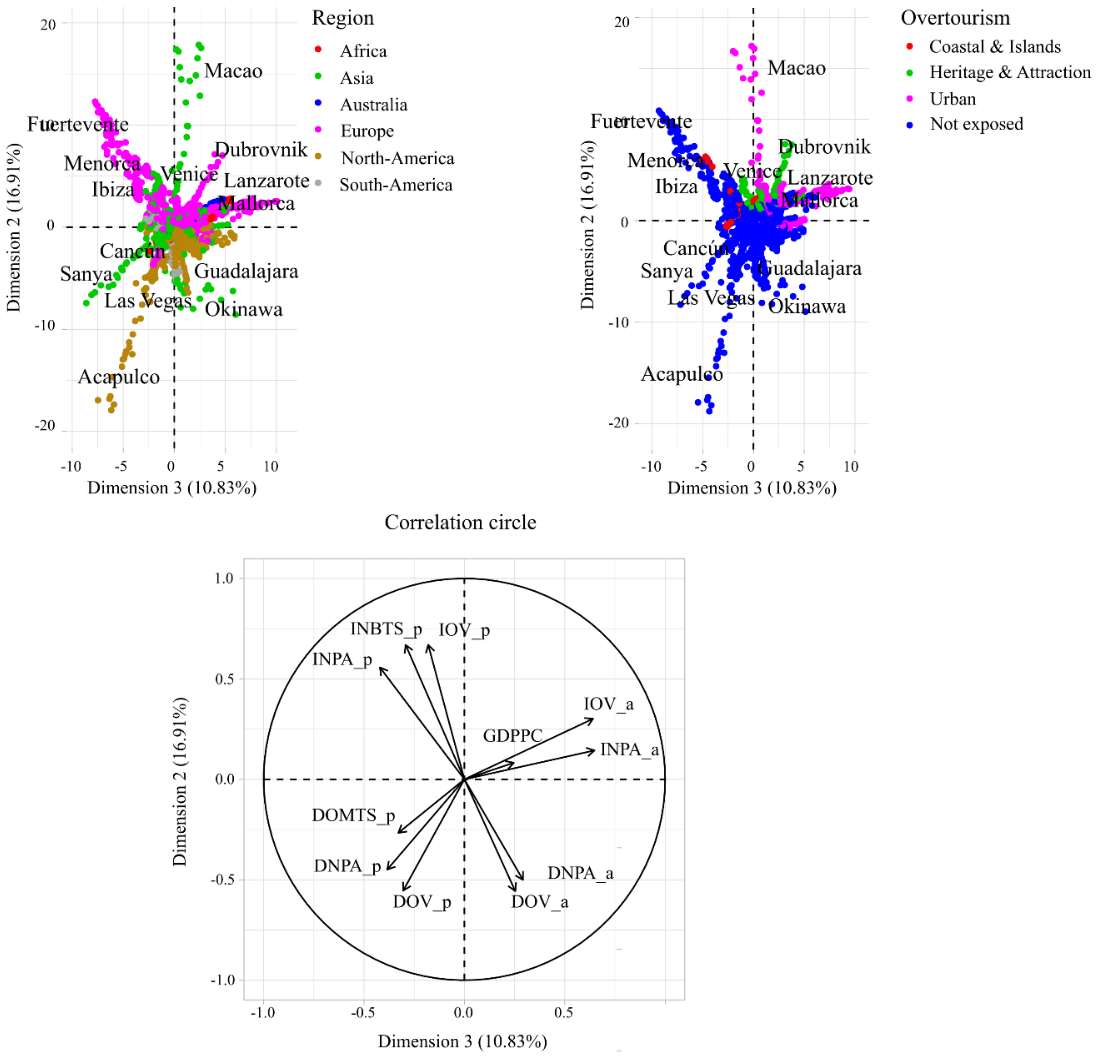

Figure 7. correlation circle and factor map (dimension 2 and 3) of the locations by region and type of overtourism (Source: Authors)

The third dimension was also investigated, and it explained a reasonable amount of variance (10.83%). The first three dimensions collectively explained 54% of the variance (Figure 7). It is crucial to create a factor map with these two dimensions, as this enables the VARCLUS components to be clearly distinguished. The first quadrant comprises area-based international indicators (INT_area cluster), while the second quadrant represents population-based international measures (INT_pop cluster). The third cluster comprises population-based domestic indicators (DOM_pop cluster), while the fourth quadrant is associated with area-based domestic indicators (DOM_area cluster). The second dimension allows for the separation of international and domestic indicators. The third dimension provides further differentiation between area-based and population-based indicators. It is evident that European coastal locations and islands, such as Mallorca, are the most affected by a relatively higher international interest compared to their population. It is also notable that Asian urban sites, such as Macao, experience a relatively higher level of international interest compared to both their area and population. The domestic area-based indicators are the largest for North American urban sites (Guadalajara) and some Asian locations (Okinawa) not exposed to overtourism. In contrast, the population-based domestic indicators are the largest for North American (Las Vegas, Acapulco, Cancún) and Asian (Sanya) locations not exposed to overtourism.

Table 2 provides the best and worst locations with respect to the given VARCLUS component (the ten cities attaining the highest and lowest scores for each indicator). Macao attained the highest score on the general indicator, whilst Malacca positioned at the lowest rank (–1.65).The findings indicate that the highest-ranking cities, including Las Vegas, Okinawa and Paris, are typically tourist hotspots that attract visitors from both domestic and international markets. Conversely, cities such as Nairobi and Hyderabad received lower scores and are considered less appealing tourist destinations. In terms of domestic overnight stays per population (DOM pop), Las Vegas demonstrates the highest level of strength (8.12), while Malacca and Luanda exhibit the lowest scores (1.11).

Table 2. The 10 locations with the highest and lowest VARCLUS component scores (Source: Authors)

Location	General indicator	Location	DOM _pop	Location	DOM _area	Location	INT _pop	Location	INT _area
Macao	7.91	Las Vegas	8.12	Okinawa (JP)	10.13	Fuerteventura (ES)	13.14	Paris (FR)	9.91
Las Vegas	7.87	Acapulco (MX)	7.44	Guadalajara (MX)	5.74	Lanzarote (ES)	12.16	Macao	6.67
Okinawa (JP)	7.65	Cancún (MX)	4.78	Acapulco (MX)	4.91	Macao	11.48	Geneva (CH)	6.64
Paris (FR)	7.52	Adelaide (AU)	4.35	Las Vegas	4.50	Ibiza-Formentera (ES)	8.11	Miami	3.89
Lanzarote (ES)	7.06	Okinawa (JP)	3.87	Miami	4.05	Mallorca (ES)	6.37	Dubrovnik (HR)	3.52
Fuerteventura (ES)	6.71	Orlando	3.21	Paris (FR)	3.82	Menorca (ES)	5.44	Kuala Lumpur (MY)	3.37
Acapulco (MX)	6.56	Edinburgh (UK)	3.17	Mexico City (MX)	3.45	Dubai (AE)	4.21	Dublin (IE)	3.07
Cancún (MX)	6.16	Kuala Lumpur (MY)	2.69	Orlando	2.85	Mecca (SA)	3.84	Lisbon (PT)	3.00
Kuala Lumpur (MY)	4.96	Lanzarote (ES)	2.67	Osaka (JP)	2.76	Gran Canaria (ES)	2.82	Bucharest (RO)	2.97
Ibiza-Formentera (ES)	4.51	Honolulu	2.35	Cancún (MX)	2.40	Dubrovnik (HR)	2.73	Nice-Cannes (FR)	2.94
Malacca (MY)	-1.65	Malacca (MY)	-1.11	Malacca (MY)	-0.74	Dhaka (BD)	-0.59	Ehime (JP)	-0.61
Nairobi (KE)	-1.61	Luanda (AO)	-1.11	Manaus (BR)	-0.74	Karachi (PK)	-0.58	Miyagi (JP)	-0.61
Izmir (TR)	-1.58	Kolkata (IN)	-1.08	Izmir (TR)	-0.74	Kolkata (IN)	-0.58	El Hierro (ES)	-0.61
Daegu (KR)	-1.58	Dakar (SN)	-1.07	El Hierro (ES)	-0.74	Nairobi (KE)	-0.58	Izmir (TR)	-0.61
Dar Es Salaam (TZ)	-1.58	Ljubljana (SI)	-1.07	Ljubljana (SI)	-0.73	Lagos (NG)	-0.58	Manaus (BR)	-0.61
Manaus (BR)	-1.56	Lille (FR)	-1.07	La Palma (ES)	-0.73	Daegu (KR)	-0.58	Chengdu	-0.61
La Paz (BO)	-1.54	Daegu (KR)	-1.06	La Gomera (ES)	-0.73	Lahore (PK)	-0.58	Jinan	-0.61
Luanda (AO)	-1.53	Kuwait City (KW)	-1.05	Fuerteventura (ES)	-0.73	Curitiba (BR)	-0.57	Daegu (KR)	-0.60
Hyderabad (IN)	-1.52	Manila (PH)	-1.05	Panama City (PA)	-0.72	Malacca (MY)	-0.57	Oklahoma City	-0.60
Belgrade (RS)	-1.48	Colombo (LK)	-1.04	Daegu (KR)	-0.72	Niigata (JP)	-0.57	Brasília (BR)	-0.60

This indicates that Las Vegas, Acapulco and Cancún are particularly appealing to domestic tourists, while cities with lower scores experience a reduced level of domestic visitor attraction. In the international guest nights per population (INT pop) dimension, Fuerteventura scored the highest (13.14) and Dhaka the lowest (-0.59), suggesting that high scoring destinations (e.g. : Canary Islands, Macao, Balearic Islands, Dubai, Mecca and Dubrovnik) are particularly popular destinations for international tourists, while destinations at the other end of the list (e.g. Dhaka, Karachi, Kolkata and Nairobi) attract fewer foreign visitors. In terms of international tourist nights per INT area, Paris leads the field (9.91), while Ehime is at the bottom of the list (-0.61). This finding serves to reinforce the preeminent international tourist appeal of world cities such as Paris, Macao, Geneva, and Dubrovnik, while cities such as Ehime and Miyagi exhibit comparatively diminished global tourism significance. The comprehensive analysis underscores the economic development and international popularity of high-scoring cities like Paris, Las Vegas, and Okinawa. Cities with lower levels of development and international reputation find themselves less competitive in the global tourism market.

CONCLUSION

The application of the VARCLUS method effectively identified five distinct clusters of overtourism indicators, each represented by latent components that facilitate the interpretation of the data. These components demonstrated a strong explanatory power, accounting for 89% of the variance, with high correlations between the indicators and their respective clusters. The analysis revealed notable regional and typological patterns, highlighting the dominance of international indicators in European coastal and heritage sites and domestic indicators in North American and Asian urban locations. Additionally, the results underlined the impact of area- and population-based metrics in distinguishing overtourism dynamics. The VARCLUS ranking indicates that high-scoring cities, including Paris, Las Vegas and Okinawa, are prominent tourist destinations both domestically and internationally. These cities demonstrate a strong attractiveness in terms of both the number of nights spent in tourist accommodation per capita and the area based indicators. In contrast, low-scoring cities, which are typically characterised by less developed economies, play a less significant role in tourism. The results provided a robust framework for analyzing overtourism patterns and suggest that the VARCLUS method offers a practical and interpretable alternative to traditional approaches to clustering complex tourism data.

As unique factors also play a key role in the perception of being involved in overtourism, it is difficult to express it with different aggregate indicators. The utilisation of a time series approach allowed for the identification of trends, thereby focusing on dynamic processes as opposed to cross-sectional analysis. The present analysis also made it possible to separate the congestion caused by domestic and foreign visitors. This phenomenon also has economic policy implications, highlighting the need for different regulatory mechanisms for domestic and inbound tourism. In European coastal and heritage destinations such as Mallorca, Dubrovnik or Venice, where the balance between international and domestic tourism has been severely disturbed, third-degree price discrimination against foreign visitors can be applied.

In the context of such settlements, it may be worth considering the introduction of "sustainability taxes" or "heritage preservation fees" for visitors, with the proceeds going towards site maintenance and infrastructure improvements. The focus should be placed on visitor regulation, conservation and dynamic pricing in order to protect fragile resources and ensure sustainability. In North American and Asian urban locations, the focus should be on urban planning, infrastructure regulation, and congestion management to support growing domestic tourism while maintaining the quality of life for local resident. There is also a need to balance the growth of tourism with the improvement of urban liveability. There is a need to strenghten infrastructure and to provide support for sustainable domestic tourism.

Limitations

A number of limitations were identified throughout the research process. The analysis included data from 255 municipalities, but the global scope of the study did not allow for a more detailed examination. The time constraints imposed by the study period (2000-2023) precluded the observation of long-term trends, but it does provide a comprehensive insight into developments in the 21st century. A longer study period could provide a deeper insight into the phenomena studied. The research relied on findings published by other authors several times, such as the classification of overtourism categories by Peeters et al. (2018) and the identification of overtourism locations as given in their research.

Author Contributions: Conceptualization, S.K. and A.Sz.T. and L.N.; methodology, S.K and L.N. formal analysis, S.K and A.SZ.T; data curation, S.K and A. M; writing - original draft preparation, A.Sz.T. and L.N; writing - review and editing, A.SZ.T and A.M.; visualization, S.K.; supervision, S.K. project administration, A.Sz.T. and L.N.; All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgements: The authors of the study would like to thank to the University of Debrecen Program for Scientific Publication. During the preparation of this work the authors used DeepL Write (deepl.com) in order to improve readability and language. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Amore, A., Falk, M., & Adie, B. A. (2020). One visitor too many: Assessing the degree of overtourism in established European urban destinations. *International Journal of Tourism Cities*, 6(1), 117-137. https://doi.org/10.1108/ijtc-09-2019-0152

Anup, K. C. (2018). Tourism and its role in environmental conservation. *Journal of Tourism and Hospitality Education,* 8, 30-47. https://doi.org/10.3126/jthe.v8i0.20009

Bąk, I., & Brelik, A. (2022). Use of tourism intensity indicators for delimitation in European Union countries. *European Research Studies Journal*. 25 (3), 2022. 273-283. https://doi.org/10.35808/ersj/3008

Bouchon, F., & Rauscher, M. (2019). Cities and tourism, a love and hate story; towards a conceptual framework for urban overtourism management. *International Journal of Tourism Cities*, 5(4), 598-619. https://doi.org/10.1108/IJTC-06-2019-0080

Brida, J. G., Meleddu, M., & Tokarchuk, O. (2017). Use value of cultural events: The case of the Christmas markets. *Tourism Management*, 59, 67-75. https://doi.org/10.1016/j.tourman.2016.07.01

Calle-Vaquero, M. D. L., García-Hernández, M., & Mendoza de Miguel, S. (2021). Urban Planning Regulations for Tourism in the Context of Overtourism. *Applications in Historic Centres. Sustainability*, 13(1), 70. https://doi.org/10.3390/su13010070

Cehan, A., & Iaţu, C. (2024). A geographical perspective on the impact of covid-19 on tourism demand in Romania. *GeoJournal of Tourism and Geosites*, 52(1), 165-175. https://doi.org/10.30892/gtg.52115-1192

Celata, F., & Romano, A. (2020). Overtourism and online short-term rental platforms in Italian cities. *Journal of Sustainable Tourism*, 30(5), 1020–1039. https://doi.org/10.1080/09669582.2020.1788568

Dodds, R., & Butler, R. (2024). Overtourism in urban environments. In: *Handbook on Sustainable Urban Tourism*, 34-43, Edward Elgar Publishing. https://doi.org/10.4337/9781803926742.00011

Doxey, G. V. (1975). A Causation Theory of Visitor-Resident Irritants; Paper given at San Diego, California, In: *The Travel Research Association Conference no.6. TTRA*, 195-198.

Drápela, E. (2023). Creating Strategies to Mitigate the Adverse Effects of Overtourism in Rural Destinations: Experience from the Czech Republic. *Sustainability*, 15(24), 16958. https://doi.org/10.3390/su152416958

Forbes, (2023). Ledson, A. France Starts Campaign To Combat Over Tourism At Sites Like Mont Saint Michel. *Forbes, Lifestyle, Travel.* 25.06.2023, 1. https://www.forbes.com/sites/alexledsom/2023/06/25/france-starts-campaign-to-combat-over-tourism-at-sites-like-mont-saint-michel/

Goodwin, H. (2016). "Chapter 3 Responsible Tourism in Destinations", In: *Responsible Tourism,*101-103, Goodfellow Publishers, Oxford: http://dx.doi.org/10.23912/978-1-910158-84-5-3126

Goodwin, H. (2017). *The challenge of overtourism*. Responsible tourism partnership, 4, 1-19.

Gyódi, K. (2023). The spatial patterns of Airbnb offers, hotels and attractions: are professional hosts taking over cities? Current Issues in Tourism, 27(17), 2757–2782. https://doi.org/10.1080/13683500.2023.2239428

Jover Báez, J., & Díaz Parra, I. (2022). Who is the city for? Overtourism, lifestyle migration and social sustainability. In: *Migration, Tourism and Social Sustainability.* eBook ISBN9781003358282

Krajickova, A., Hampl, F., & Lancosova, E. (2022). Visitors' perception of overtourism impacts in a small destination. *Anatolia*, 33(2), 236–246. https://doi.org/10.1080/13032917.2022.2040915

Manera, C., & Valle, E. (2018). Tourist Intensity in the World, 1995–2015: Two Measurement Proposals. *Sustainability*, 10(12), 4546. https://doi.org/10.3390/su10124546

Nádasi, L., Kovács, S., & Szőllős-Tóth, A. (2024). The extent of overtourism in some European locations using multi-criteria decision-making methods between 2014 and 2023. *International Journal of Tourism Cities*. https://doi.org/10.1108/IJTC-05-2024-0103

Nilsson, J. H. (2020). Conceptualizing and contextualizing overtourism: The dynamics of accelerating urban tourism. *International Journal of Tourism Cities*, 6(4), 657-671. https://doi.org/10.1108/IJTC-08-2019-0117

Oka, I., Murni, N. G. N. S., & Mecha, I. (2021). The community-based tourism at the tourist village in the local people's perspective. *GeoJournal of Tourism and Geosites*, 38(4), 988-996. https://doi.org/10.30892/gtg.38401-735

Oskam, J., & Boswijk, A. (2016). Airbnb: The future of networked hospitality businesses. *Journal of Tourism Futures,* 2, 22–42. https://doi.org/10.1108/JTF-11-2015-0048

Pagès, J. P., Pagès, J. (2014). *Multiple Factor Analysis by Example Using R*. Chapman and Hall/CRC, New York, NY, USA https://doi.org/10.1201/b17700

Pahrudin, P., Liu, L. W., Li, S. Y., Fahrurrozi, M., & Ali, M. (2022). Investigating the COVID-19 outbreak and tourism sector for future research agenda: a bibliometric analysis approach. *GeoJournal of Tourism and Geosites*, 42, 824-831. https://doi.org/10.30892/gtg.422spl23-894

Peeters, P., Gössling, S., Klijs, J., Milano, C., Novelli, M., Dijkmans, C., Eijgelaar, E., Hartman, S., Heslinga, J., Isaac, R., Mitas, O., Moretti, S., Nawijn, J., Papp, B., & Postma, A. (2018). *Research for TRAN Committee - Overtourism: impact and possible policy responses.* TRAN Commitee, Brussels, Belgium.

Popescu, A., Tindeche, C., Marcuta, A., Marcuta, L., Hontus, A., & Stanciu, M. (2023). Overtourism in the most visited European city and village destinations. *Scientific Papers Series Management, Economic Engineering in Agriculture & Rural Development,* 23(3), 718-737.

R. Core Team. (2023). R: *A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna. https://www.scirp.org/reference/referencespapers?referenceid=3582659

Remenyik, B., Barcza, A., Csapó, J., Szabó, B., Fodor, G., & Dávid, L. D. (2021). Overtourism in Budapest: Analysis of spatial process and suggested solutions. *Regional Statistics*, 11(3), 179-197. https://doi.org/10.15196/rs110303

Rogerson, C. M., & Rogerson, J. M. (2021). African tourism in uncertain times: COVID-19 research progress. *GeoJournal of Tourism and Geosites*, 38(4), 1026-1032. https://doi.org/10.30892/gtg.38406-740

Sadeghian, M. M. (2019). Negative environmental impacts of tourism, a brief review. *Journal of Novel Applied Sciences,* 8 (3), 71-76.

Sanche, R., & Lonergan, K. (2006). Variable reduction for predictive modeling with clustering. *In: Casualty Actuarial Society Forum*, 89–100.

SAS Institute Inc. (2013). SAS/STAT® 13.1 User's Guide. Cary, NC: SAS Institute Inc.

Simancas Cruz, M., & Peñarrubia Zaragoza, M. P. (2019). Analysis of the accommodation density in coastal tourism areas of insular destinations from the perspective of overtourism. *Sustainability*, 11(11), 3031. https://doi.org/10.3390/su11113031

Smeral, E. (2019). Overcrowding of tourism destinations: Some suggestions for a solution. *In Overtourism, 163-173,* Routledge., London

Smigiel, C. (2023). Touristification, rent gap and the local political economy of Airbnb in Salzburg (Austria). Urban Geography, 45(4), 713–733. https://doi.org/10.1080/02723638.2023.2233352

Smith, M. K., Sziva, I. P., & Olt, G. (2021). Overtourism and resident resistance in Budapest. *In: Travel and Tourism in the Age of Overtourism,* 24-40, Routledge, London https://doi.org/10.1080/21568316.2019.159570

Steber, F., & Mayer, M. (2024). Overtourism perception among residents in a rural proximity destination during the COVID-19-pandemic–The writing on the wall for a sustainability transition of tourism?. *Zeitschrift für Tourismuswissenschaft*, 16(3), 228-260. https://doi.org/10.1515/tw-2024-0015

Stupariu, I. M., Josan, I., Gozner, M., Stașac, M. S., Hassan, T. H., & Almakhayitah, M. Y. (2023). The geostatistical dimension of tourist flows generated by foreign tourists in Romania. *GeoJournal of Tourism and Geosites*, 50(4), 1526–1545. https://doi.org/10.30892/gtg.50432-1150

Such-Devesa, M. J., Ramón-Rodríguez, A., Aranda-Cuéllar, P., & Cabrera, A. (2021). Airbnb and overtourism: An approach to a social sustainable model using big data. *Strategies in Sustainable Tourism, Economic Growth and Clean Energy*, 211-233. https://doi.org/10.1007/978-3-030-59675-0_12

The New York Times, (2020). Holson, L. M. This Austrian Village Wants' Frozen'Fans to Let It Go. The New York Times.17,01,2020,3. https://www.nytimes.com/2020/01/17/world/europe/hallstatt-austria-frozen-tourists.htmnewTomazos, K. (2022). Social media influencers and tourism sustainability: the good, the irritating, and the desperate. In: *Handbook of innovation for sustainable tourism* (pp. 250-273). Edward Elgar Publishing. https://doi.org/10.4337/9781800372740.00023

Tomčíková, L., Svetozarovová, N., Coculʼová, J., & Daňková, Z. (2021). The impact of the global Covid-19 pandemic on the selected practices of human resources management in the relationship to the performance of tourism companies. *GeoJournal of Tourism and Geosites,* 35(2), 525-530. https://doi.org/10.30892/gtg.35233-680

UNWTO (2018): 'Overtourism'? – Understanding and Managing Urban Tourism Growth beyond Perceptions, Volume 2: Case Studies. Centre of Expertise Leisure, Tourism & Hospitality; NHTV Breda University of Applied Sciences; and NHL Stenden University of Applied Sciences (eds., 2018), World Tourism Organization, Madrid, https://doi.org/10.18111/9789284420629

Van Truong, N., & Daisuke, F. (2022). An Analysis of Overtourism Policies in Cities by Combining Quantitative and Qualitative Criteria. *Transport Policy Studies' Review*, 24, 006-018. https://doi.org/10.24639/tpsr.TPSR_24R_01

Vegnuti, R. (2020). Cinque Terre, Italy-a case of place branding: from opportunity to problem for tourism. *Worldwide Hospitality and Tourism Themes,* 12(4), 471-483. https://doi.org/10.1108/WHATT-05-2020-0032

Vigneau, E., & Qannari, E. M. (2003). Clustering of Variables Around Latent Components. *Communications in Statistics Part B: Simulation and Computation*, 32(4), 1131–1150. https://doi.org/10.1081/SAC-120023882

Visentin, F., & Bertocchi, D. (2019). Venice: an analysis of tourism excesses in an overtourism icon. In: *Overtourism: excess, discontents and measures in travel and tourism*, 18-38, CAB International, Wallingford, UK. https://doi.org/10.1079/9781786399823.0018

Wall, G. (2020). From carrying capacity to overtourism: A perspective article. *Tourism Review,* 75(1), 212-215. https://doi.org/10.1108/TR-08-2019-0356

Zhang, X. N., & Ryan, C. (2022). Cultural or Film Tourism? An analysis comparing Hobbiton (New Zealand) and Daguanyuan (China)‖. *International Marketing Journal of Culture and Tourism,* 1, 63-95. https://doi.org/10.33001/18355/imjct0103

Zmyślony, P., Leszczyński, G., Waligóra, A., & Alejziak, W. (2020). The sharing economy and sustainability of urban destinations in the (over) tourism context: The social capital theory perspective. *Sustainability*, 12(6), 2310. https://doi.org/10.3390/su12062310

Article history: Received: 16.01.2025 Revised: 05.05.2025 Accepted: 28.05.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1097-1106
DOI 10.30892/gtg.602spl07-1483

ANTECEDENTS OF TOURIST SATISFACTION AND SUSTAINABILITY TOURISM IN INDONESIA TOURISM VILLAGES

Tri WAHYUNINGSIH [1*], Ilham SENTOSA [1], Nazatul Shima Binti Abdul RANI [1]

[1] Akademi Pariwisata Mandala Bhakti, Hospitality, Surakarta, Indonesia; tri_wahyuningsih@mandalabhakti.ac.id (T.W.); ilham@unikl.edu.my (I.S.); shima.rani@unikl.edu.my (N.S.B.A.R.)

Citation: Wahyuningsih, T., Sentosa, I., & Rani, N.S.B.A. (2025). Antecedents of tourist satisfaction and sustainability tourism in Indonesia tourism villages. *Geojournal of Tourism and Geosites*, 60(2spl), 1097–1106. https://doi.org/10.30892/gtg.602spl07-1483

Abstract: The development of tourist villages in Indonesia is very rapid, however, most tourist village managers pay little attention to sustainable tourism village management, so that many tourist villages do not develop well. This research aims to investigates the influence of the dimensions of sustainability and quality of experience on tourist loyalty in tourism villages, with tourist satisfaction as a mediating variable. The dimensions of sustainability used in this research include economic, environmental, socio-cultural and institutional sustainability. This study uses a quantitative approach. The number of samples used in this research was 394 tourists from ten tourism villages in Indonesia. Data analysis methods using PLS-SEM and SmartPLS are used to evaluate model measurements, structural models, and goodness of fit models. This research found that economic and environmental sustainability positively and significantly affect tourist satisfaction in tourism village. Meanwhile, socio-cultural sustainability and institutional sustainability do not have a significant influence on tourist satisfaction. The quality of experience significantly affects satisfaction, revisit intention, and WOM. Meanwhile, satisfaction has a significant effect on revisit intention and WOM. Based on these findings, to increase WOM and revisit intention, tourist village managers must pay attention to the dimensions of economic and environmental sustainability, as well as the quality of tourist experiences that can satisfy tourists. Tourists who are satisfied can provide recommendations to other people and have the desire to come back to the tourist village. Based on the explanation above regarding tourist satisfaction shows that tourist satisfaction is the key to increasing tourist loyalty. In the context of a tourist village, tourists' satisfaction can be created by providing memorable experiences in terms of services, facilities, attractions, and accommodations. Satisfied tourists are a long-term investment for a tourist village because it creates the intention to visit the village again, or if they do not visit again, they will recommend it to other people and mention optimistic things about the village. This study develops a desire model for tourism villages that are increasingly developing throughout the world. These results can be used as a strategy or reference for tourism village managers to develop sustainable tourism villages.

Keywords: sustainability tourism village, tourist satisfaction, quality of experience, tourist loyalty

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INTRODUCTION

Tourism village encompasses diverse activities that typically revolve around nature-based tourism, agriculture, village life and culture, fishing, and the appreciation of rural landscapes (Yanan et al., 2024). Tourism awareness communities or village governments develop rural tourism in Indonesia into tourism villages (Rosalina et al., 2023). The government and entrepreneurs utilize tourism villages as a profitable prospect and can improve the economic conditions of the village (Yanan et al., 2024). Villages engage in many efforts overseen by the local administration or tourism advocacy organizations to transform their villages into tourist destinations. Tourism villages worldwide are experiencing rapid development by integrating natural and cultural attractions, historical significance, artistic elements, well-equipped public tourist amenities, and convenient accessibility while preserving the authentic procedures and traditions of village life (Gao & Wu, 2017).

This phenomenon promotes sustainable development, safeguards the local heritage, and enhances the welfare of locals and tourists (Yanan et al., 2024). Tourism villages provide distinctive prospects for tourists to fully engage in the local culture, partake in traditional activities, and contribute to the local economy, ensuring their vacation is genuinely memorable and influential. Tourism villages enhance the variety of tourism offerings, entice many tourists, and foster economic development in rural regions by offering genuine and authentic travel experiences (Song et al., 2021).

Sustainable tourism villages are rural locations that preserve and promote locally produced goods and values while utilizing tourism as a catalyst for economic growth and new job and income opportunities (Chin et al., 2016). Sustainable tourism villages offer activities focusing on social tourism sustainability, environment, culture, and economy (Vu et al., 2024). Sustainable tourism villages promote sustainable practices for more efficient resource use and reduced emissions and waste (Pásková et al., 2021). They also promote the conservation of natural and cultural resources and commit to innovation and Sustainability in all social and environmental aspects (Maziliauske, 2024). Sustainable tourism provides socio-economic benefits for people living in tourist destination areas, conserves tourism resources, protects the

* Corresponding author

environment, and creates authentic tourism experiences (Rosalina et al., 2023). This sustainable tourism aims to unite tourists and local communities for mutual benefit. When more tourist funds go directly into the pockets of people in tourist destinations, they spend most or all of those funds on the local economy. With more money circulating in society, this will encourage the emergence of new businesses, create jobs, and reduce poverty (Luukkonen, 2013).

The Sustainability of tourist destinations is measured by tourist loyalty, therefore many studies have examined various variables that influence tourist loyalty. For example, Campón-Cerro et al. (2017), their research found that competitiveness and tourism satisfaction have a significant effect on tourist loyalty. These findings corroborate studies by Al-Ansi and Han (2019), which examined how perceived quality and contentment affected visitors' intentions to return and spread the word about a destination. According to Cong's (2016) research, contentment and the inclination to return are highly influenced by the perceived quality of tourism sites. Research conducted by Ardyan & Wibisono (2019), Suhartanto et al. (2020), and Sangpikul (2018) examined the influence of travel experience on tourist satisfaction and loyalty. One of the common socio-demographic characteristics investigated in recent research is previous experience. Van-Dunem et al. (2021) and Rajaratnam et al. (2015) revealed that previous visits strengthened revisit intention. Based on the findings of this study, it is evident that the travel experience exerts a substantial impact on visitor satisfaction and loyalty.

Studies on tourists' views of destinations and their future behavior concentrate on tourist satisfaction since it is crucial in influencing the intention to revisit and word-of-mouth promotion in destination marketing (Elfiondri et al., 2021; Khoo, 2022). Positive word-of-mouth recommendations from satisfied tourists significantly influence others to visit an area more than negative feedback from dissatisfied tourists (Cong, 2016; Suhartanto et al., 2020). Research findings often contradict one other when satisfaction is considered a mediating variable. Research indicates that satisfaction can have a complete, partial, or no mediation effect on the correlation between goal quality and behavioral intention or loyalty behavior (Žabkar et al., 2010).

No research directly examines the sustainable dimensions of tourist loyalty in tourism villages. The study conducted by Asmelash & Kumar (2019) focused only on investigating the correlation between the sustainability dimensions encompassing economic, environmental, socio-cultural, and institutional aspects and the level of satisfaction experienced by tourists in the context of museums and cultural tourism. The research findings suggest that tourist satisfaction is influenced by institutional, economic, and socio-cultural Sustainability. Nevertheless, environmental Sustainability has a negligible effect.

In order to address the limitations of prior research findings, the present study aims to investigate the influence of the sustainability factor on tourist loyalty, specifically in terms of word of mouth and revisit intention. This relationship will be examined through the mediating variables of satisfaction and quality of tourist experience within the context of tourism villages. This study aims to investigate the implementation of sustainable principles in 10 developing tourism villages located in Indonesia. The findings of this research will serve as a valuable reference for managers of other tourism villages that are still in development. This study to investigates the influence of the dimensions of Sustainability and quality of experience on tourist loyalty in tourism villages, with tourist satisfaction as a mediating variable.

LITERATURE REVIEW

1. The Relationship between Sustainable Tourism and Tourist Satisfaction

Prior studies have demonstrated that pleasure can be differentiated between individuals' initial desires and their experience following consumption. Within the tourism industry, satisfaction is determined by the alignment between pre-visit expectations and post-visit experiences. Tourists feel satisfied when displays surpass their pre-existing expectations, whereas they sense disappointment when their pre-existing expectations do not align with their observed performance (Quynh et al., 2021). Sustainable tourism development will only occur with tourist satisfaction (Quynh et al., 2021; Zakiah et al., 2023). According to prior scholarly investigations, a correlation exists between tourist satisfaction and sustainable tourism development (Asmelash & Kumar, 2019; Zakiah et al., 2023). The findings of Asmelash & Kumar (2019) and Zakiah et al. (2023) indicate that contented tourists are more likely to engage in word-of-mouth recommendations, express favorable sentiments to their acquaintances, and exhibit loyalty towards the tourist sites they have visited. The pleasure mentioned above is significant in promoting sustainable tourism growth while minimizing the financial burden of marketing expenses (Asmelash & Kumar, 2019).

The population's compliance with the elements of sustainable tourism development was examined in several earlier studies, but the viewpoint of tourists is still a topic that needs more research (Chatkaewnapanon & Kelly, 2019). Some experts concentrate on analyzing the impact of the environmental dimension (Chatkaewnapanon & Kelly, 2019), environmental, social, and cultural dimensions (Asmelash & Kumar, 2019), economic, socio-cultural, and environmental dimensions (Asmelash & Kumar, 2019; Aydin & Alvarez, 2016). Fewer few have extended the use of the triple bottom line to include the institutional component as the fourth primary pillar of development for sustainable tourism (Asmelash & Kumar, 2019). Research by Rojulai et al. (2018) employing Social Exchange Theory (SET) discovered four characteristics of the influence of tourist growth. They are reliable and valid regarding the economy, society, culture, and environment. Furthermore, there is validation for the quality of life and support for expanding tourism.

The predictive power of the economic dimension is the strongest, followed by the social dimension. However, the environmental dimension is found to be statistically negligible. In a previous study, Wiwattanakantanga & To-ima (2014) investigated the impact of four aspects of sustainable tourism on the level of satisfaction experienced by tourists in Thailand. The study conducted by Asmelash & Kumar (2019) found that social culture and environment were the primary and secondary factors impacting tourist satisfaction, with the economic dimension being the third most significant. In their examination of the area, the researchers found that the institutional factor had the least significant impact on tourist satisfaction. The study conducted by Jasrotia et al. (2023) found that three dimensions of sustainability, namely environmental, socio-cultural and institutional, have a significant effect on tourist satisfaction. In another study, Jasrotia et al. (2024) found that the influence of the sustainability dimensions, namely environmental, socio-cultural and institutional, had a significant effect on tourist satisfaction, while the economic dimension did not have a significant effect on tourist satisfaction. Previous research findings have not reached the same conclusion, a study conducted by Rasoolimanesh et al. (2023) found that only socio-cultural sustainability had a significant influence on tourist satisfaction and revisit intention, while the economic and environmental dimensions had no significant influence.

The study formulated and examined the following four hypotheses based on the investigations above.

H1: Economic Sustainability influences tourist satisfaction in tourist villages.

H2: Environmental Sustainability influences tourist satisfaction in tourist villages.

H3: Socio-Cultural Sustainability influences tourist satisfaction in tourist villages.

H4: Institutional Sustainability influences tourist satisfaction in tourist villages.

2. The Relationship between Experience Quality and Tourist Satisfaction and Tourist Loyalty

Research in the tourism sector tends to agree on a positive relationship between the quality of the experience and tourists' intention to visit again. Ardyan & Wibisono (2019) show that tourists' experience with attractions is a fundamental aspect that influences tourists' consumption behavior when asked to visit tourist attractions. The favorable correlation between visitor experiences and attractions and future behavior, such as satisfaction, behavioral intentions, and destination recall, has been reinforced by later studies. The correlation between the quality of the experience, the contentment of tourists, and their loyalty enhances the loyalty model (Cao et al., 2024; Quynh et al., 2021; Suhartanto et al., 2020).

A study conducted by Li & Zhou (2021) found that the quality of experience has a significant effect on tourist loyalty. Zhong (2024) study found the influence of the experience quality dimensions, namely service quality, environmental quality, and perceived value on revisit intention. The study conducted by Pereira et al. (2023) found the influence of experience quality on tourist satisfaction, tourist loyalty and recommendations.

Several studies show that satisfaction has a full mediation effect, partial mediation effect, or no mediation effect on the relationship between destination quality and behavioral intentions or loyalty behavior (Al-Ansi & Han, 2019; Ardyan & Wibisono, 2019; Asmelash & Kumar, 2019). Based on this research, the following hypothesis can be formulated:

H5: The quality of experience influences tourist satisfaction in tourist villages.

H6: The quality of experience influences the intention to revisit rural tourist villages.

H7: The quality of experience influences word-of-mouth promotion in tourist villages.

3. The Relationship between Tourist Satisfaction and Tourist Loyalty

Previous research linking satisfaction and loyalty has shown that there is a significant influence of satisfaction on loyalty (Asmelash & Kumar, 2019; Breiby & Slåtten, 2018; Wang & Li, 2023; Zakiah et al., 2023). Loyalty is a two-dimensional variable with behavioral and attitudinal components, and it is examined in most studies. One of the best sources of loyalty is attitude, derived from the feelings visitors evoke and generally suggests a positive attitude toward a particular place. Even if a person does not return to a destination, this attitude demonstrates their propensity to suggest it to future travelers (Cossío-Silva et al., 2019; Wang, L., & Li, 2023).

Many studies investigate the relationship between tourist satisfaction and loyalty (Asmelash & Kumar, 2019; Breiby & Slåtten, 2018). Studies conducted by Kusumah (2024) and Kusdibyo (2022) found that tourist satisfaction has a significant effect on tourist destination loyalty. Pandey et al. (2023) and Shatnawi et al. (2023) found that satisfaction has a significant effect on revisit intention. While Dias et al. (2023) and Arismayanti et al. (2024) found that satisfaction has a significant effect on word of mouth. Based on the previous research, the following hypothesis can be formulated:

H8: Tourist satisfaction influences the intention to visit a tourist village again

H9: Tourist satisfaction influences word of mouth in tourist villages.

Based on the literature review and hypothesis development, the following conceptual framework is proposed in this research:

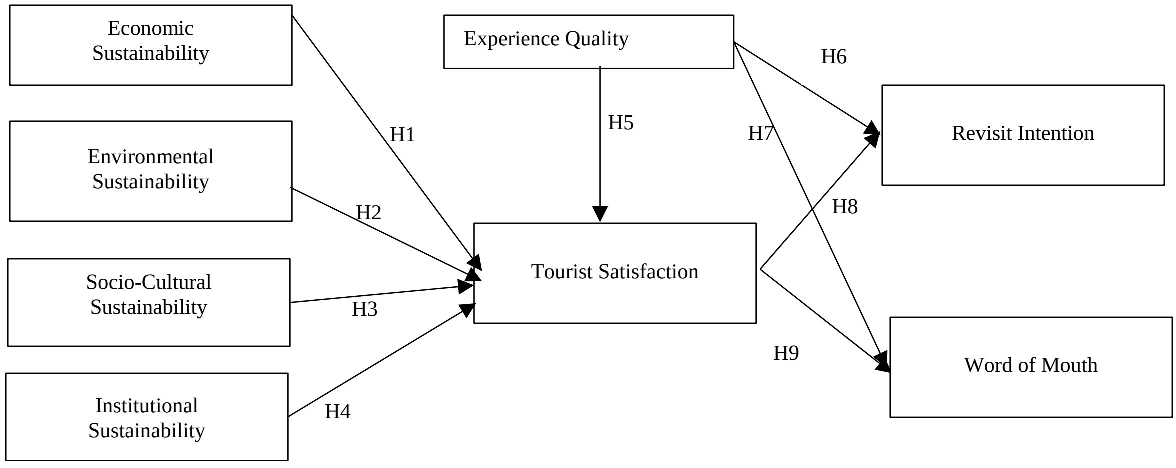

Figure 1. Conceptual Framework (Source: Own Conceptual Model)

METHOD OF RESEARCH

In this research, the number of samples taken used proportional random sampling and purposive sampling. The number of samples taken was 394 tourists. The measurement of tourism sustainability variables refers to Asmelash & Kumar (2019), and the dimensions of economic Sustainability include the quality of employment, economic viability, and local welfare. The dimensions of Environmental Sustainability include physical integrity, biodiversity, resource efficiency, and environmental purity. Socio-cultural dimensions of Sustainability include social justice, visitor satisfaction, local control, community welfare, and cultural richness. The institutional sustainability dimension includes locally oriented control policies, political participation, local policy planning, and political support at various levels of government.

The Experience Quality measurement refers to Suhartanto et al. (2019), which includes indicators of escape, peace of mind, involvement, recognition, and learning. Measurement of tourist satisfaction refers to Asmelash & Kumar (2019), with indicators namely attractiveness, friendliness, treatment of tourist staff, reasonableness of entry fees, quality of information, safety and security, accessibility, and accommodation. Measurement of revisit intention refers to Som et al. (2014), and word of mouth refers to Akin & Demirel (2011). A five-point Likert scale was used to measure all variables in this study.

The data collection method uses a questionnaire. Questionnaires were given to respondents in this research, namely tourists in tourist villages in Karanganyar Regency. The data analysis used is PLS-SEM. The present study employs a multivariate statistical analysis to assess factors' collective impact, conduct predictive research, and explore or construct structural models (Hair et al., 2018). The assessment of the structural equation modeling (SEM) model in partial least squares (PLS) analysis includes the evaluation of the measurement model, the structural model, and the model's goodness of fit. The flow of this research can be seen in Figure 2 as follows:

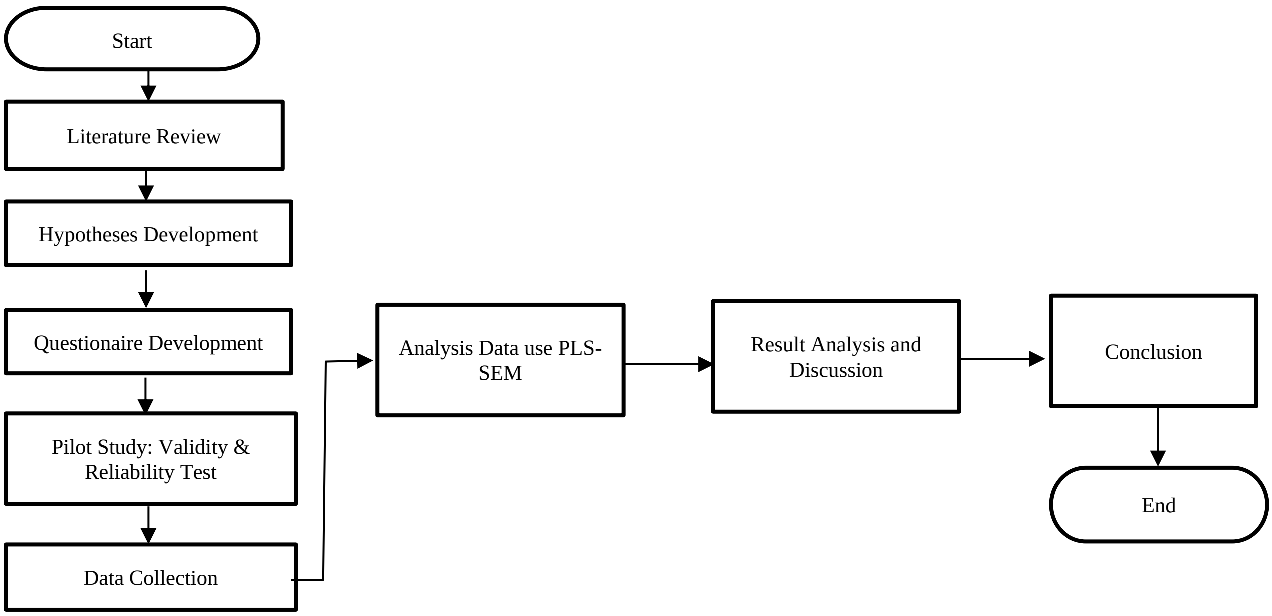

Figure 2. Flowchart of Methodology

RESULT AND DISCUSSION

1. Evaluation of measurement models

The measurement model in this research consists of a reflective model where the variables of economic Sustainability, environmental Sustainability, socio-cultural Sustainability, institutional Sustainability, quality of experience, tourist satisfaction, WOM, and intention to revisit are measured reflectively. The results of the measurement model evaluation can be seen in Table 1. Table 1 shows that all variables have indicators with an outer loading above 0.5, meaning the measurement items are valid. The level of variable reliability is acceptable, as indicated by Cornbach's alpha and composite reliability, which is above 0.70. A convergent validity level (AVE) > 0.50 meets the requirements for good convergent validity. Discriminant validity was tested using the HTMT. The results of the discriminant validity test can be seen in Table 2.

Table 1. Outer Loading, Composite Reliability, and Average Variance Extracted
(Source: Results from the SmartPLS analysis by the authors)

Variable	Items	Outer Loading	Cronbach Alpha	Composite Reliability	AVE
Economic Sustainability (EC)	11	0.778 – 0.889	0.957	0.963	0.702
Environmental Sustainability (EN)	12	0.876 – 0.935	0.980	0.982	0.817
Socio-cultural Sustainability (SC)	10	0.875 – 0.901	0.966	0.971	0.786
Institutional Sustainability (IN)	12	0.806 – 0.878	0.961	0.966	0.719
Quality of experience (EQ)	11	0.843 - 0.903	0.969	0.973	0.784
Tourist satisfaction (SAT)	8	0.870 - 0.899	0.961	0.967	0.786
WOM	3	0.937 – 0.953	0.940	0.962	0.893
Revisit intention (RI)	3	0.919 – 0.942	0.926	0.953	0.872

Tabel 2. Rasio Heterotrait-Monotrait (HTMT) (Source: Results from the SmartPLS analysis by the authors)

	EC	**EN**		**EQ**	**IN**	**RI**	**SAT**	**SC**	**WOM**
EC									
EN	0,729								
EQ	0,552	0,612							
IN	0,641	0,702		0,773					
RI	0,458	0,502		0,700	0,592				
SAT	0,568	0,632		0,657	0,603	0,651			
SC	0,648	0,742		0,590	0,749	0,519	0,558		
WOM	0,520	0,601		0,664	0,587	0,641	0,787	0,518	

Discriminant validity is attained because the HTMT value for pairing variables is below 0.90, indicating that the variable for the item whose measurement is more vital than dividing the variance into other variable items.

Discriminant validity with cross-loadings shows that all measuring items have significant correlations with each variable and weak correlations with others.

2. Evaluation of Structural Model

The correlation evaluation model tests the research variables that influence the hypothesis. The structural model evaluation has three steps. First, check for multicollinearity between variables and the inner VIF measure. Inner VIF values below 5 suggest no variable multicollinearity.

The second is to test the hypothesis between variables using t or p values. A significant relationship exists between variables if the t-statistic is more than 1.96 or the p-value is less than 0.05. Results and 95% confidence intervals for computed line coefficient parameters must also be communicated. Third, the f square value shows the direct variables' structural level influence (f square 0.02 is low, 0.15 is medium, and 0.35 is strong) (Hair et al., 2018).

Table 3. Inner VIF (Source: Results from the SmartPLS analysis by the authors)

Variable	RI	SAT	WOM
EC		2.191	
EN		2.892	
EQ	1.677	2.353	1.677
IN		3.375	
SAT	1.677		1.677
SC		2.684	

The evaluation results of the measurement model with Inner VIF show that the Inner VIF value between variables is smaller than 5. This value indicates no multicollinearity between variables or a low multicollinearity between variables. These results strengthen the robust (not biased) parameter estimation results in SEM PLS. The results of the hypothesis test show that seven hypotheses are accepted and two hypotheses are rejected. This result means that the model used has a good or acceptable structure. The results of testing the PLS-SEM model can be seen in Figure 2.

Table 4. Hypothesis test (Source: Results from the SmartPLS analysis by the authors)

Hypothesis	Path Coefficient	P value	f^2	Conclusions
EC -> SAT	0.128	0.017	0.0 15	H1 accepted
EN -> SAT	0.252	0.000	0.0 44	H2 accepted
SC -> SAT	0.054	0.374	0.002 _	H3 rejected
IN -> SAT	0.007	0.923	0.000 _	H4 rejected
EQ -> SAT	0.381	0.000	0.123 _	H5 accepted
EQ -> RI	0.459	0.000	0.253 _	H6 accepted
EQ -> WOM	0.266	0.000	0.107 _	H7 accepted
SAT -> RI	0.323	0.000	0.126 _	H8 accepted
SAT -> WOM	0.580	0.000	0.506	H9 accepted

3. Goodness of Fit Model

PLS is a variance-based SEM analysis with the aim of testing model theory, which focuses on prediction studies. Therefore, several measures were developed to state that the submitted model was acceptable, such as R square and SRMR (Hair et al., 2019). According to Chin (1998), the qualitative interpretation value of R square is 0.19 (low influence), 0.33 (moderate influence), and 0.66 (high influence). Based on the processing results above, the joint influence of economic Sustainability, Environmental Sustainability, socio-cultural Sustainability, institutional Sustainability, and quality of experience on tourist satisfaction is 0.500 or 50% (moderate influence). The magnitude of the influence of the quality of experience and tourist satisfaction on intention to revisit is 50.4% (moderate influence), and the influence of the quality of experience and tourist satisfaction on WOM is 60.4% (moderate influence). Hair et al. (2021) state that SRMR values below 0.08 imply a well-fitted model. The obtained model estimation value is 0.035, indicating a high level of appropriateness for the model. This result implies that the variables in the model can be elucidated by empirical evidence.

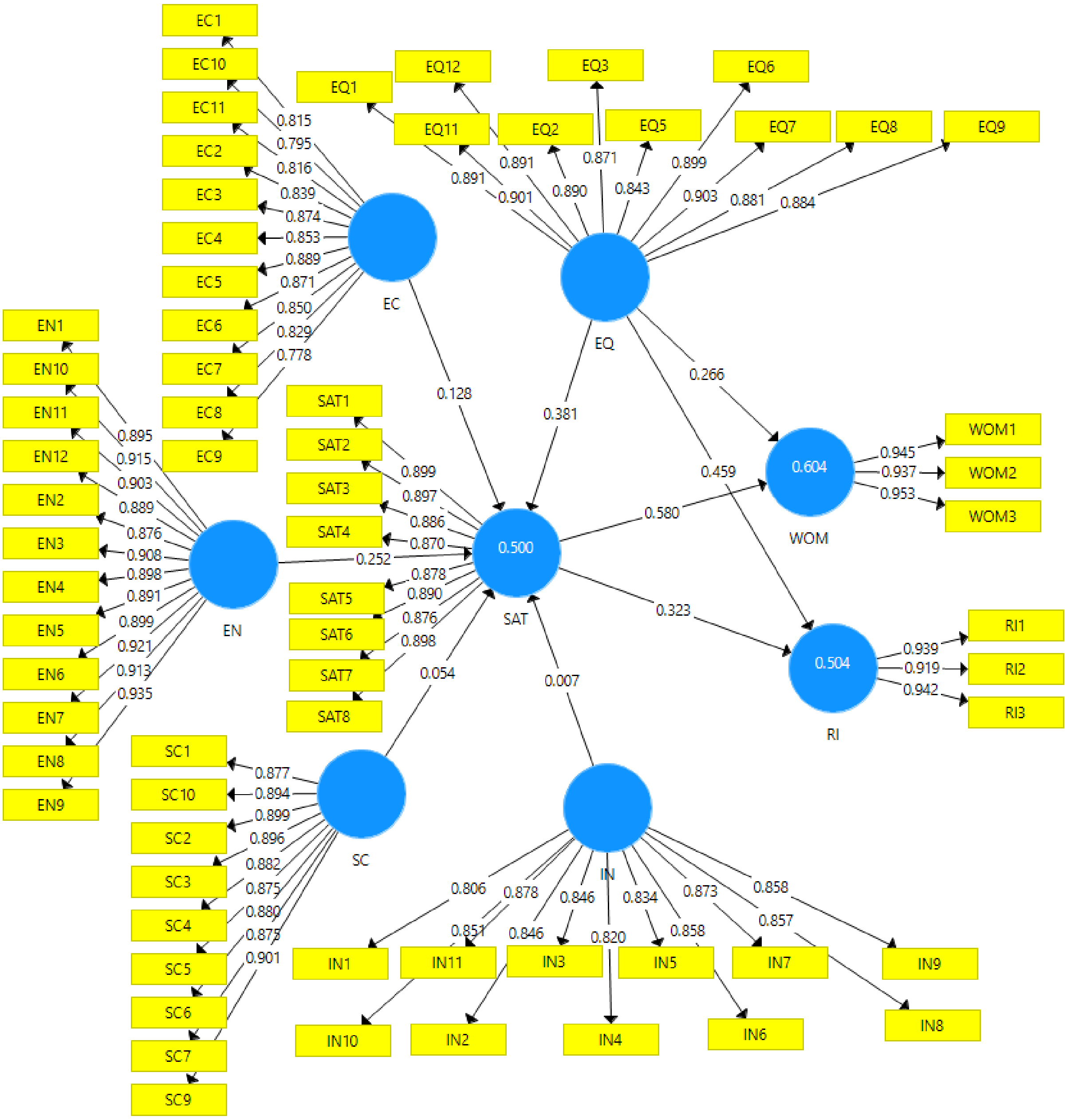

Figure 3. Estimated Results of SEM Structural Model

DISCUSSION

1. The Influence Of Economic Sustainability And Tourist Satisfaction

Economic Sustainability in tourism villages refers to the ability of tourism villages to manage their resources and responsibly generate long-term profits for their communities. This study found that economic settlement positively affects and significantly influences tourist satisfaction. The positive influence shows that the more (less) tourists show a positive perception of economic stability, the higher the perception of sustainable governance in the economic aspect, and the greater the tourist satisfaction with the village. The results of this hypothesis testing are in line with research conducted by Lee & Hsieh (2016), Asmelash & Kumar (2019), and Aydin & Alvarez (2016). These significant results indicate that the ability of tourism village managers to manage ecosystems is excellent. Economic Sustainability is vital to economic continuity and prosperity, especially in diversifying local resources and managing seasonal tourist visits. Meanwhile, other measurement items are good but need to be improved again so that they can increase tourist satisfaction.

Business diversification must help tourist destinations remain competitive (Campón-Cerro et al., 2017) and help tourist villages overcome market trends or unexpected economic conditions and attract more tourists (Winchenbach et al., 2022). Tourism managers use differentiated strategies by offering various product innovations (Szromek et al., 2022) and services to reach a broader target market, thereby increasing revenue potential. Tourism villages with various products and services can reduce dependence on one source of income. If one product or service experiences a decline in demand or fails, the company still has other sources of income that can cover the loss. Diversification can also help tourism villages cope with unexpected changes in market trends or economic conditions and attract more tourists. A tourism village can reach different market segments and cater to tourists' needs and preferences by offering various products and services.

2. The Influence of Environmental Sustainability on Tourist Satisfaction

The ecological challenges tourism villages face require managers to develop strategies that conserve natural resources and control pollution. Managing the environment at this tourist destination requires understanding and concern from all parties about managing tourism without damaging the environment. Tourists appreciate destination managers who operate by improving, preserving, and conserving nature. Tourists are very interested in tourist destinations that maintain the ecological balance of nature and a clean and healthy environment.

This research found that the presence of the environment has a positive and significant effect on tourist satisfaction. The positive influence shows that the better the sustainable environmental management carried out by the tourism village, the more favorable it will be perceived by tourists, resulting in satisfaction. The results of this hypothesis testing are different from the research conducted by Lee & Hsieh (2016), Asmelash & Kumar (2019), and Aydin & Alvarez (2016). However, based on respondents' perceptions, tourists only perceive the level of environmental desirability as quite good, meaning that sustainable environmental management needs to be improved. Environmental Sustainability is very concerned with resource efficiency and environmental purity, especially in the management of solid waste and rubbish. Meanwhile, other good measurement items need to be maintained and improved again.

3. The Influence of Socio-cultural Sustainability on Tourist Satisfaction

Tourism villages should preserve their social and cultural values as an attraction for tourists to learn customs and enjoy the natural village atmosphere. This research found that socio-cultural Sustainability has a positive but not significant effect. The insignificant influence of socio-cultural Sustainability on satisfaction shows that the management of socio-cultural Sustainability has not been implemented optimally, so positive perceptions have not been obtained from tourists. This result is reflected in the tourist perception index of only 65.9%, in the sufficient category.

This study's findings differ from research conducted by Lee & Hsieh (2016) and Aydin & Alvarez (2016), who show that socio-cultural Sustainability positively and significantly affects tourist satisfaction. According to the findings of Asmelash & Kumar (2019), socio-cultural desires emerged as the most influential factor in predicting tourist happiness, with institutional and economic desires following suit. Socio-cultural Sustainability is crucial in facilitating substantial cultural exchange between tourists and local populations, promoting positive and harmonious connections. Tourists desire a direct link to the historical and cultural aspects of the local area.

4. The Influence of Institutional Sustainability on Tourist Satisfaction

Institutional sustainability refers to an institution's capacity to sustain its performance in its strategic environment by effectively adapting to the changing dynamics of its surrounding strategic environment. In the context of tourism villages, institutions are related to the institutional capabilities of tourism villages that can survive in the long term in managing tourism in their villages. This research found that institutional Sustainability positively and significantly affects tourist satisfaction. This result means a better initial moment of tourism villages can increase tourist satisfaction. The findings of this study are in line with research conducted by Lee & Hsieh (2016), Asmelash & Kumar (2019), and Aydin & Alvarez (2016), which show that institutional Sustainability has a positive and significant effect on tourist satisfaction.

According to Purnomo et al. (2020), things that can influence the level of community participation in development include age, education, type of work, income level, length of stay in the village, level of communication and leadership. A bottom-up perspective in understanding the village development process can show the community's leadership role and active involvement, which influences every planning and budget allocation policy. The village head's leadership can be seen in four indicators: ideal influence, inspirational motivation, intellectual stimulation, and individual consideration. These indicators, of course, have a direct influence on community participation. According to other research written by Mai et al.(2023), Purnomo et al. (2020), and Abidin et al., (2022) it is also stated that it is essential to pay attention to the role of leadership in developing and directing all components of tourism. Broad participation and contribution of traditional leadership can provide a solid foundation for the successful development of cultural tourism.

The leadership model developed in tourism development is parabolic or traditional leadership, which has the power to implement customs that have been in effect for hundreds of years. So, in dealing with, managing, and organizing a problem, in this case, tourism, the involvement of institutions or other non-governmental institutions, including non-governmental organizations or traditional institutions and traditional communities that live amid society, is vital.

5. The Influence Of Experience Quality On Tourist Satisfaction

This research found that the quality of experience positively and significantly affects tourist satisfaction. This result means that the more tourists have exciting experiences, the more tourist satisfaction will increase. The results of the perception index show that respondents' perceptions of the Quality of Experience are generally moderate/reasonably good. This result shows that respondents perceive the quality of experience as quite good, so tourism village managers in Karanganyar regency need further improvements in serving tourists in all these measurement items.

Experience is an essential concept in hospitality and tourism to understand consumer behavior. The hospitality and tourism industry's products are always based on experience and are classified as total experiences (Lewis & Chambers, 2000). Tourist experience is interpreted as a subjective mental state felt by participants and as an individual's subjective evaluation of events, which includes affective, cognitive, and behavioral aspects (Tung & Ritchie, 2011).

The travel experience begins before arrival at the destination and ends with memories of the experience and plans for future visits. The key to gaining profits in the tourism industry is the creation of high-quality hedonic experiences and meaningful, unique, and memorable travel experiences to generate customer retention (Coudounaris, 2017; Kim, 2014). Each customer may have a positive or negative experience, which is an inevitable result of consuming a product/service because their needs and desires differ (Yuan & Wu, 2008). Regarding the quality of experience in tourism villages, this study reveals that tourists greatly value attraction scenarios that offer a sense of comfort. These situations contribute to a high-quality experience and enhance tourist satisfaction.

6. The Influence Of Experience Quality On Tourist Loyalty In Tourism Villages

The quality of experience in tourism has been widely researched, but different tourist segments can experience different experiences because their motivations for consuming tourist attractions differ (Cao et al., 2024; Suhartanto et al., 2020). This study found that the quality of experience has a positive and significant effect on the intention to revisit and WOM as a proxy for tourist loyalty. This result means that the better the experience tourists feel, the greater their intention to visit again and WOM. Loyalty comprises both attitudinal and behavioral elements. Attitudinal loyalty is regarded as the most potent form of loyalty, reflecting the genuine personal attitude towards a destination and stemming from the travelers' emotions toward that destination. This attitude indicates an individual's inclination to suggest a site to other tourists, even if they do not revisit it (Chen et al., 2022). Loyalty to a tourism village is essential because it generates profits and further growth and development. These characteristics are common in tourist destinations and are even more relevant in tourism villages. This factor is due to the influence of tourism on local economic growth, employment, and community welfare, especially in the local economy, which is closely related to the tourism sector.

7. The Influence Of Tourist Satisfaction On Tourist Loyalty In Tourism Villages

The results of this study found that satisfaction has a positive and significant influence on the intention to visit WOM. The positive influence shows that the more satisfied tourists are, the greater their desire to visit again and recommend to others. The research aligns with Al-Ansi & Han (2019) and Chi et al. (2019), which concluded that tourist satisfaction is an antecedent that influences tourist loyalty. This result shows that tourists are essential in promoting tourism in villages. Therefore, tourism village managers need to understand tourists' perceptions of satisfaction. Tourist destination satisfaction is the assessment of tourists' emotional or affective reactions to the effectiveness of items and services provided at the destination. It determines the degree of comfort, enjoyment, and approval when using or consuming a product or service (Suhartanto et al., 2020). Past studies have shown the significant importance of contentment due to tourists' elevated expectations and ambitions for the future. Emphasizing high satisfaction levels and offering distinctive experiences are crucial priorities for marketers and managers of global tourist sites (Suhartanto et al., 2020).

Based on the explanation above regarding tourist satisfaction shows that tourist satisfaction is the key to increasing tourist loyalty. In the context of a tourist village, tourists' satisfaction can be created by providing memorable experiences in terms of services, facilities, attractions, and accommodations. Satisfied tourists are a long-term investment for a tourist village because it creates the intention to visit the village again, or if they do not visit again, they will recommend it to other people and mention optimistic things about the village.

CONCLUSION

Based on the analysis and discussion findings, the following conclusions can be drawn: Economic and environmental Sustainability positively and significantly affect tourist satisfaction in tourism village. Experience quality and tourist satisfaction have positively and significantly affected revisit intention and word of mouth in tourism village.

Tourist satisfaction has a positive and significant effect on the relationship between economic Sustainability, Environmental Sustainability, experience quality with revisit intention, and WOM in tourism village. This study relies on a setting that is limited in scope, which impacts the generalization of the model in conditions.

Therefore, to apply the study in different settings, attention must be paid to the background profile of the variables behind the test. This limitation is necessary to avoid problems with test results that impact errors when formulating recommended management policies. This study only uses a questionnaire as a data collection tool so that it can cause an element of subjectivity in the respondents' answers. For future research it is best to use in-depth interviews to complement the questionnaire results.

Author Contributions: Conceptualization, TW., I.S. and N.S.B.A.R.; methodology, T.W. and I.S.; software, I.S. and N.S.B.A.R.; validation, T.W. and I.S.; formal analysis, T.W., I.S. and N.S.B.A.R.; investigation, T.W. and I.S.; data curation, N.S.B.A.R. and I.S.; writing - original draft preparation, T.W. and I.S.; writing - review and editing, T.E., I.S. and N.S.B.A.R.; visualization, I.S. and N.S.B.A.R.; supervision, I.S.; project administration, T.W. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Abidin, Z., Handayani, W., Zaky, E. A., & Faturrahman, A. D. (2022). Perceived risk and attitude's mediating role between tourism knowledge and visit intention during the COVID-19 pandemic: implementation for coastal-ecotourism management. *Heliyon*, *8*(10), e10724. https://doi.org/10.1016/j.heliyon.2022.e10724

Akin, E., & Demirel, Y. (2011). An empirical study: Are corporate image relation satisfaction and identification with corporate influential factors on effectiveness of corporate communication and consumer retention. *European Journal of Social Sciences*, *23*(1), 128–153.

Al-Ansi, A., & Han, H. (2019a). Role of halal-friendly destination performances, value, satisfaction, and trust in generating destination image and loyalty. *Journal of Destination Marketing and Management*, *13*(December 2018), 51–60. https://doi.org/10.1016/j.jdmm.2019.05.007

Al-Ansi, A., & Han, H. (2019b). Role of halal-friendly destination performances, value, satisfaction, and trust in generating destination image and loyalty. *Journal of Destination Marketing and Management*, *13*(May 2019), 51–60. https://doi.org/10.1016/j.jdmm.2019.05.007

Ardyan, E., & Wibisono, U. (2019). Between Self Congruity, Destination Relationship and Memorable Tourist Experience: An Empiric Study on the Loyalty of Tourist Destination. *Jurnal Dinamika Manajemen*, *10*(1), 111–123. https://doi.org/10.15294/jdm.v10i1.17408

Arismayanti, N. K., Andiani, N. D., & Kusyanda, M. R. (2024). Tourist satisfaction model: Structural relationship of destination image, electronic word of mouth, and service quality in Bali destination. *Nurture*, *18*(2), 360–372. https://doi.org/10.55951/nurture.v18i2.623

Asmelash, A. G., & Kumar, S. (2019). The structural relationship between tourist satisfaction and sustainable heritage tourism development in Tigrai, Ethiopia. *Heliyon*, *5*(3), e01335. https://doi.org/10.1016/j.heliyon.2019.e01335

Aydin, B., & Alvarez, M. D. (2016). English-speaking tourists' evaluation of sustainability attributes in cultural tourism destinations: The case of Cusco. *Teorija in Praksa*, *53*(4), 942–958.

Breiby, M. A., & Slåtten, T. (2018). The role of aesthetic experiential qualities for tourist satisfaction and loyalty. *International Journal of Culture, Tourism and Hospitality Research*. https://doi.org/https://doi.org/10.1108/IJCTHR-07-2017-0082 Downloaded

Campón-Cerro, A. M., Hernández-Mogollón, J. M., & Alves, H. (2017). Sustainable improvement of competitiveness in rural tourism destinations: The quest for tourist loyalty in Spain. *Journal of Destination Marketing and Management*, *6*(3), 252–266. https://doi.org/10.1016/j.jdmm.2016.04.005

Cao, E., Chong, K. M., Pan, L., Ning, L., Pan, F. (Diana), & Li, K. (Ke). (2024). Oh I remember the beauty and aesthetics of guilin!: Exploring the implications of memorability on tourist loyalty through a two-wave panel data. *Heliyon*, *10*(1), e23365. https://doi.org/10.1016/j.heliyon.2023.e23365

Chatkaewnapanon, Y., & Kelly, J. M. (2019). Community arts as an inclusive methodology for sustainable tourism development. *Journal of Place Management and Development*, *12*(3), 365–390. https://doi.org/10.1108/JPMD-09-2017-0094

Chen, H., Wang, Y., & Li, N. (2022). *Research on the Relationship of Consumption Emotion , Experiential Marketing , and Revisit Intention in Cultural Tourism Cities : A Case Study*. *13*(July), 1–13. https://doi.org/10.3389/fpsyg.2022.894376

Chi, S. Y., Huang, B. W., & Luo, H. X. (2019). Some rural attractions which attract tourists. *Asian Journal of Agriculture and Rural Development*, *9*(1), 99–110. https://doi.org/10.18488/journal.1005/2019.9.1/1005.1.99.110

Chin, C.-H., Lo, M.-C., & Ramayah, T. (2016). Rural Tourism Sustainable Management and Destination Marketing Efforts: Key Factors from Communities' Perspective. *Journal of Sustainable Development*, *9*(4), 179. https://doi.org/10.5539/jsd.v9n4p179

Cong, L. C. (2016). A formative model of the relationship between destination quality, tourist satisfaction and intentional loyalty: An empirical test in Vietnam. *Journal of Hospitality and Tourism Management*, *26*, 50–62. https://doi.org/10.1016/j.jhtm.2015.12.002

Cossío-Silva, F. J., Revilla-Camacho, M. Á., & Vega-Vázquez, M. (2019). The tourist loyalty index: A new indicator for measuring tourist destination loyalty? *Journal of Innovation and Knowledge*, *4*(2), 71–77. https://doi.org/10.1016/j.jik.2017.10.003

Coudounaris, D. N. (2017). Antecedents of memorable tourism experience related to behavioral intentions. *Psychol Mark*, *34*, 1084–1093. https://doi.org/10.1002/mar.21048

Elfiondri, Zaitul, & Rina, N. (2021). Tradition, cultural contact and English for tourism: the case of Mentawai, Indonesia. *Heliyon*, *7*(6), e07322. https://doi.org/10.1016/j.heliyon.2021.e07322

Gao, J., & Wu, B. (2017). Revitalizing traditional villages through rural tourism: A case study of Yuanjia Village, Shaanxi Province, China. *Tourism Management*, *63*, 223–233. https://doi.org/10.1016/j.tourman.2017.04.003

Hair, J. F. H., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2018). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2–24.

Jasrotia, S. S., Kamila, M. K., & Patel, V. K. (2023). Impact of Sustainable Tourism on Tourist's Satisfaction: Evidence from India. *Business Perspectives and Research*, *11*(2), 173–189. https://doi.org/10.1177/22785337211043960

Jasrotia, S. S., Raj, V. A., Chib, S., & Rai, S. S. (2024). Do Sustainability Factors Influence Homestay Tourist Satisfaction and Revisit Intention: The Moderating Role of Local Community Attitude. *Journal of Quality Assurance in Hospitality and Tourism*. https://doi.org/10.1080/1528008X.2024.2429075

Khoo, K. L. (2022). A study of service quality, corporate image, customer satisfaction, revisit intention and word-of-mouth: evidence from the KTV industry. *PSU Research Review*, *6*(2), 105–119. https://doi.org/10.1108/PRR-08-2019-0029

Kim, J. (2014). The antecedents of memorable tourism experiences : The development of a scale to measure the destination attributes associated with memorable experiences. *Tourism Management*, *44*, 34–45. https://doi.org/10.1016/j.tourman.2014.02.007

Kusdibyo, L. (2022). Tourist loyalty to hot springs destination: the role of tourist motivation, destination image, and tourist satisfaction. *Leisure/ Loisir*, *46*(3), 381–408. https://doi.org/10.1080/14927713.2021.1986420

Kusumah, E. P. (2024). Sustainable tourism concept: tourist satisfaction and destination loyalty. *International Journal of Tourism Cities*, *10*(1), 166–184. https://doi.org/10.1108/IJTC-04-2023-0074

Lee, T. H., & Hsieh, H. (2016). Indicators of sustainable tourism : A case study from a Taiwan ' s wetland. *Ecological Indicators*, *67*, 779–787. https://doi.org/10.1016/j.ecolind.2016.03.023

Lewis, R. ., & Chambers, R. . (2000). *Marketing Leadership in Hospitality, Foundations and Practices* (3rd ed.). Wiley & Son.

Li, Y., & Zhou, X. (2021). The Influence of Tourists' Experience Quality on Loyalty of Baotu Spring Scenic Spot on SPSS 24 Software. In *Proceedings - 2021 International Conference on Management Science and Software Engineering, ICMSSE 2021* (pp. 179–182). https://doi.org/10.1109/ICMSSE53595.2021.00045

Luukkonen, T. (2013). *Rationale and Impacts*. 115–142.

Mai, V. N., Nguyen, Q. N., & Hien, L. T. D. (2023). Citizen Participation in Community-Based Tourism Development in the Mekong Delta, Vietnam. *Journal of Law and Sustainable Development*, *11*(5), 1–16. https://doi.org/10.55908/sdgs.v11i5.749

Maziliauske, E. (2024). Innovation for sustainability through co-creation by small and medium-sized tourism enterprises (SMEs): Socio-cultural sustainability benefits to rural destinations. *Tourism Management Perspectives*, *50*(January 2023), 101201. https://doi.org/10.1016/j.tmp.2023.101201

Pandey, U., Tariqul Islam, M., & Hossain, M. I. (2023). Exploring the influence of servicescape, e-WoM, and satisfaction on tourists' revisit intention to yoga tourist destination: Evidence from Patanjali Yogpeeth, India. *Journal of Tourism and Development*, *44*, 313–333. https://doi.org/10.34624/rtd.v44i0.31978

Pásková, M., Wall, G., Zejda, D., & Zelenka, J. (2021). Tourism carrying capacity reconceptualization: Modelling and management of destinations. *Journal of Destination Marketing and Management*, *21*(May). https://doi.org/10.1016/j.jdmm.2021.100638

Pereira, M. S., Cardoso, A., Magalhães, M., Faria, S., & Cairrão, Á. (2023). A Study on the Tourist Experiences in the Peneda-Gerês National Park: Impact on Satisfaction, Loyalty and Recommendations. *IBIMA Business Review*, *2023*. https://doi.org/10.5171/2023.765777

Pujiastuti, E. E., Joko, H., Utomo, N., Nurharumi, L. L., & Widowati, D. (2023). Tourist Loyalty Based On Destination Image , Tourist Motivation , and Tourist Satisfaction. *Jurnal Bisnis Dan Manajemen*, *10*(1), 97–108.

Purnomo, S., Rahayu, E. S., Riani, A. L., Suminah, S., & Udin, U. (2020). Empowerment model for sustainable tourism village in an emerging country. *Journal of Asian Finance, Economics and Business*, *7*(2), 261–270. https://doi.org/10.13106/jafeb.2020.vol7.no2.261

Quynh, N. H., Hoai, N. T., & Loi, N. Van. (2021). The role of emotional experience and destination image on ecotourism satisfaction. *Spanish Journal of Marketing - ESIC*, *25*(2), 312–332. https://doi.org/10.1108/SJME-04-2020-0055

Rahayu, S., & Candera, M. (2023). Tourist Loyalty to Halal Tourism in Indonesia : The Role of Services Quality , Satisfaction , and Experience Quality. *Jurnal Manajemen Bisnis*, *14*(1). https://doi.org/10.18196/mb.v14i1.17790

Rajaratnam, S. D., Nair, V., Sharif, S. P., & Munikrishnan, U. T. (2015). Destination quality and tourists' behavioural intentions: rural tourist destinations in Malaysia. *Worldwide Hospitality and Tourism Themes*, *7*(5), 463–472. https://doi.org/10.1108/WHATT-06-2015-0026

Rasoolimanesh, S. M., Chee, S. Y., & Ari Ragavan, N. (2023). Tourists' perceptions of the sustainability of destination, satisfaction, and revisit intention. *Tourism Recreation Research*. https://doi.org/10.1080/02508281.2023.2230762

Rojulai, N., Aminudin, N., Asmalina, N., & Anuar, M. (2018). A Conceptual Framework of Tourism Development Perceived Impact , Quality of Life and Support for Tourism Further Development : A Case of Malaysia Homestay Experience Programme (MHEP) A Conceptual Framework of Tourism Development Perceived Impact , Quali. *International Journal of Academic Research in Business and Social Science*, *8*(16), 339–355. https://doi.org/10.6007/IJARBSS/v8-i16/5136

Rosalina, P. D., Dupre, K., Wang, Y., Putra, I. N. D., & Jin, X. (2023). Rural tourism resource management strategies: A case study of two tourism villages in Bali. *Tourism Management Perspectives*, *49*(March), 101194. https://doi.org/10.1016/j.tmp.2023.101194

Sangpikul A. (2018). The effects of travel experience dimensions on tourist satisfaction and destination loyalty: the case of an island destination. *International Journal of Culture, Tourism and Hospitality Research*, 1–15.

Shatnawi, H. S., Alawneh, K. A., Alananzeh, O. A., Khasawneh, M., & Masa'Deh, R. (2023). the Influence of Electronic Word-of-Mouth, Destination Image, and Tourist Satisfaction on Unesco World Heritage Site Revisit Intention: an Empirical Study of Petra, Jordan. *Geojournal of Tourism and Geosites* , *53*(4), 1390–1399. https://doi.org/10.30892/gtg.50420-1138

Song, H. J., Yeon, J., & Lee, S. (2021). Impact of the COVID-19 pandemic: Evidence from the U.S. restaurant industry. *International Journal of Hospitality Management*, *92*(June 2020), 102702. https://doi.org/10.1016/j.ijhm.2020.102702

Suhartanto, D., Brien, A., Primiana, I., Wibisono, N., & Triyuni, N. N. (2020). Tourist loyalty in creative tourism: the role of experience quality, value, satisfaction, and motivation. *Current Issues in Tourism*, *23*(7), 867–879. https://doi.org/10.1080/13683500.2019.1568400

Szromek, A. R., Walas, B., & Kruczek, Z. (2022). The Willingness of Tourism-Friendly Cities ' Representatives to Share Innovative Solutions in the Form of Open Innovations. *Journal Open Innov: Technology, Marketing. Complex. and Complexity.*, *8*(112).

Tung, V. W. S., & Ritchie, J. R. B. (2011). EXPLORING THE ESSENCE OF MEMORABLE TOURISM EXPERIENCES. *Annals of Tourism Research*, *38*(4), 1367–1386. https://doi.org/10.1016/j.annals.2011.03.009

Van-Dunem, T., Coelho, A., & Bairrada, C. (2021). International tourist's perception of the destination image: A study applied to Luanda, Angola. *Geojournal of Tourism and Geosites* , *35*(2), 411–418. https://doi.org/10.30892/gtg.35220-667

Vu, A. D., Vo-Thanh, T., Nguyen, T. T. M., Bui, H. L., & Pham, T. N. (2024). Tourism social sustainability in remote communities in Vietnam: Tourists' behaviors and their drivers. *Heliyon*, *10*(1), e23619. https://doi.org/10.1016/j.heliyon.2023.e23619

Wang, L., & Li, X. (2023). The five influencing factors of tourist loyalty : A. *PLoS ONE*, *18*(4), 1–21. https://doi.org/10.1371/journal.pone.0283963

Winchenbach, A., Hanna, P., & Miller, G. (2022). *Annals of Tourism Research Constructing identity in marine tourism diversi fi cation*. *95*. https://doi.org/10.1016/j.annals.2022.103441

Wiwattanakantanga, P., & To-ima, J. (2014). Tourist satisfaction on sustainable tourism development, amphawa floating MarketSamut songkhram, Thailand. *In ENRIC2014) The 1st Environment and Natural Resources International Conference*, 114–117.

Yanan, L., Ismail, M. A., & Aminuddin, A. (2024). How has rural tourism influenced the sustainable development of traditional villages? A systematic literature review. *Heliyon*, *10*(4), e25627. https://doi.org/10.1016/j.heliyon.2024.e25627

Yuan, Y.-H., & Wu, C. (2008). Relationships Among Experiential Marketing, Experiential Value, and Customer Satisfaction. *Journal of Hospitality & Tourism Research*, *32*(3), 387–410. https://doi.org/10.1177/1096348008317392

Žabkar, V., Brenčič, M. M., & Dmitrović, T. (2010). Modelling perceived quality, visitor satisfaction and behavioural intentions at the destination level. *Tourism Management*, *31*(4), 537–546. https://doi.org/10.1016/j.tourman.2009.06.005

Zakiah, S., Baharta, E., & Hermana, D. (2023). Analysis of Tourist Loyalty and Satisfaction Based on Destination Image of Sustainable Tourism in West Java. *Jurnal Ilmu Manajemen Advantage*, *7*(1), 97–108.

Zhong, J. (2024). A Study of the Effect of Tourist Experience Quality on Loyalty and Revisit Intention in Tourist Destinations. *Applied Mathematics and Nonlinear Sciences*, *9*(1). https://doi.org/10.2478/amns-2024-3103

Article history: Received: 22.01.2025 Revised: 06.05.2025 Accepted: 29.05.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1107-1118
DOI 10.30892/gtg.602spl08-1484

NETWORKS, RELATIONAL AND STRUCTURAL SOCIAL CAPITAL: IN THE ASSOCIATION OF ARTISANS IN THE ECUADORIAN ANDES

Patricia HERNÁNDEZ-MEDINA [1*], Diego PINILLA-RODRÍGUEZ [1], Lenin FUENTES-GAVILANEZ [1], María Alejandra PAUBLINI-HERNÁNDEZ [2]

[1] Universidad Nacional de Chimborazo, Faculty of Political and Administrative Sciences. Riobamba, Ecuador; patricia.hernandez@unach.edu.ec (P.H.M.); dpinilla@unach.edu.ec (D.P.R.); lenin.fuentes@unach.edu.ec (L.F.G.)
[2] Universidad Católica Andrés Bello, Faculty of Economic and Social Sciences. Venezuela, Caracas; mpaublin@ucab.edu.ve (M.A.P.H.)

Citation: Hernández-Medina, P., Pinilla-Rodríguez, D., Fuentes-Gavilanez, L., & Paublini-Hernández, M.A. (2025). Networks, relational and structural social capital: In the association of artisans in the Ecuadorian Andes. *Geojournal of Tourism and Geosites*, 60(2spl), 1107–1118. https://doi.org/10.30892/gtg.602spl08-1484

Abstract: This study explores the role of social capital within the Association of Artisans of La Victoria, located in Ecuador, with the aim of analyzing its relational and structural dimensions. Social capital is defined as the network of relationships and connections that facilitate cooperation among community members and is essential for economic and social development. In the case of the Association of Artisans of La Victoria, the study seeks to assess how both internal (bonding) and external (bridging) networks influence the competitiveness and sustainability of artisans in a globalized context. To achieve this objective, a mixed-methods approach was employed, combining qualitative and quantitative research. The first phase involved participatory action research, where interviews were conducted with members of the association, particularly with the president, to identify strengths, weaknesses, opportunities, and threats. In the second phase, a quantitative assessment of social capital was carried out using a self-assessment tool designed to measure the structural and relational dimensions of social capital, specifically bonding and bridging relationships. Aspects such as trust, cooperation, participation, and commitment among the association's members, as well as access to external networks and connectivity with public and private institutions, were analyzed. The results obtained indicate that bonding social capital, based on internal trust and cooperation among members, is well-developed. However, bridging social capital, which is crucial for accessing external markets and securing institutional support, remains underdeveloped. External relationships with other associations and organizations are limited, preventing the association from expanding its reach in broader, global markets. Additionally, demographic factors such as gender, age, and education play a significant role in shaping social capital. In particular, women are noted for their contributions to strengthening internal networks, while age and education affect participation in external relations. The study concludes that, to improve the competitiveness and sustainability of the Association of Artisans of La Victoria, it is crucial to strengthen external networks by promoting cooperation with public and private institutions and encouraging the use of technologies such as digital marketing. The lack of marketing strategies and limited engagement with external actors hinder the growth and commercialization of artisan products.

Keywords: social capital, structural dimension, relational dimension, craft activity, craft tourism

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INTRODUCTION

In Latin American countries, there has been a trend in recent years of forming associations as a strategy to strengthen territories' economic dimension of sustainable development, as part of the so-called social and solidarity economy, social economy, or third-sector economy (Lee, 2020; Piani & Curiazi, 2024). In this sustainable development of territories, sustainability does not only imply the strengthening of economic elements, but it is a multidimensional process, based on four pillars: competitiveness or the economic dimension, sustainability itself or the environmental dimension, equity conceived as access to opportunities and expansion of human freedoms (Sen, 2000) or socio-cultural dimension, and the governance pillar or political-institutional dimension. In this way, the sustainable development of the territory depends on the interrelation between four dimensions that in many cases are opposed and generate tensions (Hernández-Medina, 2025). In the search to minimize these tensions, some countries have opted for social production enterprises through the Solidarity Economy or third sector, given that they make it possible to reduce inequalities, generate spaces for innovation and economic resilience (Kutsenko et al., 2021; Ibourk & Raoui, 2022; Sadykov & Akhmetov, 2022).

Unlike for-profit companies, social or solidarity economy organizations seek the common good of their members and, as stated by Manríquez et al. (2017:16), they constitute 'a set of practices that are based on factors such as: cooperation, reciprocity, ethics, where the well-being of populations and the planet is given primacy over accumulation and unequal development'. Experiences in Latin America on organizations with this solidarity approach, developed from an objective of local development and use of endogenous resources, include Bolivia, Costa Rica with agricultural cooperatives, Mexico

* Corresponding author

with savings and credit cooperatives, Venezuela with the link between gender and cooperativism as a mechanism to achieve economic empowerment through the creation of financial institutions dedicated to providing financial products to women. In addition, rural extension services are identified in Brazil, service cooperatives in Canada and, in Ecuador, the promotion of the popular and solidarity economy, both in the financial and non-financial sectors (Annoni et al., 2021; Menezes, 2021; Vieta & Heras, 2022; Hernández & Gurría, 2024). The most notable advances, at least in terms of the regulatory framework, have been seen in countries such as Ecuador, Bolivia and Venezuela, where the maximum objective of good living and collective well-being, framed in the preservation of the environment as heritage, is enshrined in their constitutions. In spite of this, these social and solidarity economy organizations must achieve sustainability, not economic but socio-economic sustainability, which allows them to cover costs with the stable sale of their products, obtain public support through subsidies, maintain working capacities and networks, consolidate the association and achieve the well-being of their members, all in an environment in which they must compete in the market under unequal conditions with the rest of the capital-based companies. In the context of sustainable development and globalization, the solidarity and social economy has established itself as a key strategy for the preservation of ancestral knowledge, local culture and sustainable tourism. Unlike conventional economic models, this alternative promotes community participation, respect for natural resources and the self-management of indigenous peoples. The transmission of traditional knowledge is an intergenerational process that faces threats due to the expansion of extractives economies and cultural homogenization, which is why the solidarity economy, through cooperatives, associations and community networks, makes it possible to strengthen this knowledge by ensuring that its practice and teaching are economically sustainable. An example of this is the cooperatives of artisans in Latin America, where weaving, ceramics and metalworking techniques have been protected thanks to fair trade and ethical production systems (Egorov et al., 2022; Salim et al., 2023).

The strengthening of cultural identity is another central axis, in which communities that adopt solidarity economy models manage to resist the loss of their intangible heritage, promoting festivals, fairs and spaces for cultural dissemination. This self-management not only protects cultural heritage but also fosters social cohesion and the self-determination of peoples (Ariffin et al., 2023; Arinta et al., 2023; Duxbury et al., 2023).

Tourism based on the solidarity economy is presented as an alternative to mass tourism, which, in many cases, generates displacement of local communities and exploitation of their resources without direct benefits for the inhabitants (Pebrianto et al., 2024; Ruiz-Palacios et al., 2024). In contrast, community-based tourism allows local populations to manage their own tourism resources, offering authentic and sustainable experiences; some successful experiences of this model include tourist routes managed by indigenous communities in the Andes and the Amazon, where visitors participate in traditional activities such as pottery making, agro-ecological cultivation and the narration of ancestral myths. This approach not only boosts the local economy but also educates tourists about the importance of cultural and ecological conservation (Lan et al., 2021; Forero & Saavedra, 2022; Arinta et al., 2023; Duxbury et al., 2023).

In spite of the protagonist role that social production organizations play in the development and preservation of resources, the high rate of free-riding is surprising (Hernández & Gurría, 2024), particularly in countries such as Ecuador, where more than 50% of the population has been free-riding since its implementation in 2010. The factors are multiple, ranging from lack of funding, marketing channels, lack of institutional support and even social disarticulation, lack of trust and commitment of its members and the little interrelation with the environment, the community and strategic actors.

Strategies to improve their performance are different, one of them being the strengthening of networks, relationships, trust of their members, integration and cooperation. Specifically, Alburquerque (2004: 159) establishes that the socio-cultural dimension "together with the economic relations and production techniques are essential for the local economic development". Trigilia (2001: 439) proposes in this sense that social capital in the framework of local development should be considered as "an instrument to increase specialized knowledge, infrastructures, services and forms of integration between firms, thereby strengthening competitiveness". The literature on social capital is extremely broad, which makes it difficult to establish a consensus on its definition. If we start from the different visions of the social sciences, sociology proposes that social capital should be considered as resources associated with participation in a network, either by considering individual appropriation (Coleman, 1990) or collective appropriation as a public good (Bourdieu, 1985). From the political perspective, Putnam (1993) established that it is the set of norms, social organization, and trust, which enable and enhance collective action. Meanwhile, the economic position approaches the analysis from a neoclassical perspective with a microeconomic approach, in which social capital is an additional capital to physical, natural, or human capital that generates economic growth; and there is the perspective based on terms of economic development (Knack & Keefer, 1997; Sabatini, 2005) at macro level and framed in the territory.

Social capital could be classified into at least three groups linked to the social structure perspective (dimensions of social capital), the network perspective or functional vision, and the level perspective, which largely determines the dimensions, approaches and functions proposed in literature. From the perspective of social structure, Nahapiet & Ghoshal (1998) propose three dimensions for their study: the structural, relational, and cognitive dimensions. The first is linked to connections between actors, the second is to the resources that are generated from that relation, for instance friendship, confidence, reciprocity, motivation, solidarity, cooperation, and influence on others' behavior, and the third is the codes and languages for communication that are linked to intellectual capital.

In the perspective of levels, individual, meso or macro-collective, formal, and informal groupings, the community and even the country would be considered, which recalls the contradictory position of some authors as to whether social capital is a public good with positive and negative externalities, or a private good. From a network-based perspective, as proposed by Atria (2003), social capital is based on a group's resources and networks, which can be horizontal, including those generated within the network (bonding) or with other networks (bridging), and vertical, including other hierarchical levels (linking). Thus, the network is a set of members that are connected through relationships. These networks can be business networks in which they are linked to improving performance based on specific objectives related to the value chain; social networks based on communication or intangible benefits (social capital); and physical networks associated with physical capital, infrastructure, or geographic characteristics. Specifically, the social network can be unstructured or structured, which is indicated in structural social capital within the social structure perspective, as the configuration is based on the cohesion or density of relationships, diversity, or weak links. In the case of unstructured networks, they are those that do not have organization and could be considered as micro or individual social capital (level perspective), they meet sporadically or without any leadership and usually remain for an abbreviated time.

These structured networks can be horizontal or vertical and bring about collective or meso social capital (Lin, 2008). In the first case, if they are related to business activity, they would be connecting organizations that carry out the same activity within the production chain or perform similar work, while in the second case they link actors at different levels of the chain, so it is suggested that vertical networks generate a greater economic impact than horizontal ones (Casson & Giusta, 2007). There are therefore determinants or causal factors of social capital that condition the structural elements and the positive or negative consequences. The structural elements are associated with ties, the hierarchy of relationships (vertical or horizontal), access to membership or participation in the network, the type of structural and cognitive social capital, and binding or bridging the structure of the network, temporal and spatial characteristics, and group alignment.

In addition, some authors who have addressed the problem of the factors that influence social capital at each level, individual, meso or macro, mention that in the case of the individual, variables associated with educational level, income level, employment status, age, gender, and marital status should be taken into account (Kaasa & Parts, 2008; Asadullah, 2017; Kaasa, 2019). Empirical evidence seems to show that the effects of these variables are not always equal; rather, they will depend on the conceptualization of social capital or the measurement perspective, and on the social fabric in which the analysis is made. An example is that for Kaasa (2019), informal relationships are influenced by age, as well as participation in organizations (Katungi et al., 2007), with the youngest showing better results, while citizens' participation improves as educational level increases. Regarding trust, Alesina & La Ferrara (2002) identify that lower incomes and educational levels reduce trust, as does belonging to vulnerable groups, such as women.

These networks and relationships that constitute social capital are a determining factor in the performance of solidarity economy organizations, as higher levels of trust, cooperation and participation in networks contribute to the sustainability of these associations (Marconatto et al., 2019; Soares et al., 2020; Salinas & Sastre-Merino, 2021; Egorov et al., 2022; Prayitno et al., 2023; Awad et al., 2024). Considering the role of these organizations in the preservation of ancestral knowledge, culture and community tourism, this research analyses the Association of Artisans of La Victoria, Cotopaxi, an organization responsible for maintaining the craft tradition of the territory and promoting tourism in the area; this pottery craft technique was recognized as an intangible heritage of Ecuador in 2019. The study, through participatory action research, initially addresses the analysis of the situation of the association in productive terms through interviews and brainstorming in plenary with its members and, secondly, the evaluation of the levels of social capital and the identification of its determinants. The assessment of social capital is based on the network perspective, which seeks to characterize bridging relationships, in which the network is the structural element of social capital, and the multidimensional or social structure perspective, considering the structural dimension and the relational dimension. While the identification of factors that could influence social capital (bonding and bridging) considers variables associated with the demographic components of age, marital status, gender, educational level, seniority in the network and position held. In the case of Ecuador, studies on social capital at any level are scarce. This is why this research attempts to analyze the level of social capital of the Association of Artisans of the parish of La Victoria, in the canton of Pujilí in the province of Cotopaxi, Ecuador, as a third sector that preserves the intangible heritage of the area associated with the activity of pottery craftsmanship.

MATERIALS AND METHODS

The Association of Artisans of La Victoria's situation analysis, as well as of its members, was conducted in two phases, the first through interviews with the president of the Association, the second with the discussion of the past, current and future perspectives of the organization in the members' assembly. The last phase consisted of a survey to assess the level of social capital (Figure 1). In order to carry out the first and second phases, a qualitative study was designed with regard to the social theme; it was an intervention based on the methodology of Participatory Action Research (PAR), and therefore two approaches are intended; firstly, a socio-political one that implies the empowerment and consequently the greater participation of the artisans in the governance processes and a socio-cultural approach affirming the identity and the image, which can be translated into a process of structuring a collective brand.

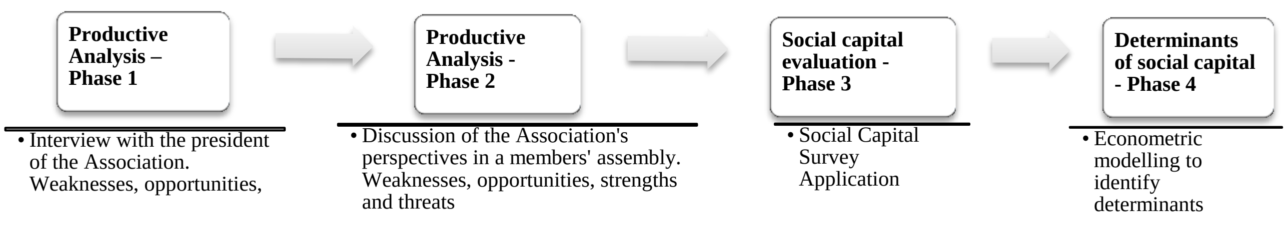

Figure 1. Methodology steps

Initially, qualitative techniques were used to obtain the first results of the work and to guide the subsequent phases. The techniques specifically used in these phases were: i) an interview with the president of the Association, which made it possible to identify, at least in broad terms, a series of opportunities, threats, weaknesses and strengths, both of the association and of the artisan activity as a whole; ii) at the social level, it was decided to use a brainstorming technique, whose systematic approach was as follows: 'Past, present and future of the Association of Artisans of La Victoria, positive and negative aspects'. For this joint work session, the participants were divided into two heterogeneous groups separated spatially; a group reflection was proposed. One group thought positively, and the other group thought negatively. 100 members of the Association of Artisans of La Victoria took part in the session, which lasted 1 hour. After a 45-minute reflection, the ideas were put together on a flipchart. These ideas were then submitted to the two groups, which became one. The ideas generated represented the opinion of the group. The first analysis conducted in this work reflects the so-called EMIC level (description in meaningful terms) of the participants' considerations.

The work developed with the Association in this phase was based on a participatory diagnosis, due to the socio-economic and cultural characteristics of the area, associated with the need to promote craft activities, specifically pottery. This proposal consolidates the operation focused on marketing, product mix, evaluation of production and raw materials.

The work session for this participatory diagnosis was conducted with the aim of identifying the existing weaknesses and strengths of the members of the Association with a view to generating proposals in three basic areas, to subsequently conduct a socio-economic and productive diagnosis through an instrument, identifying opportunities for improvement.

In the last phase, to respond to the research objective, the short instrument proposed by Mujika et al. (2010) in the self-assessment model of social capital in organizations was used, given that the purpose is to analyze the social capital of the Association of Artisans of La Victoria from the perspective of social structure, considering the structural dimension (quantity of relationships) and the relational dimension (quality of relationships), and from the network perspective by evaluating the structural and relational component both at the level of bonding and bridging relationships.

The instrument was made up of five sections, the first of which consisted of five general questions associated with gender, training, age, seniority in the organization, and whether a person is simply a member or holds a position within it, allowing us to identify the possible factors that contribute to explaining social capital.

The second section was linked to the relational dimension, both at the level of bonding and bridging relationships. It consisted of 39 approaches grouped into 6 components: information and communication, level of trust, cooperation, participation, commitment and relationship with the environment, which was complemented by a third section that directly assessed the quality of relationships through 7 approaches. The fourth and fifth sections were related to the structure of relationships, in the sense that they inquired about the number of informal linking and bridging relationships (7 approaches) and participation in other formal organizations (2 approaches). Each of the statements in the second section considered a Likert-type response scale, ranging from 1 to 5, where 1 represents strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, and 5 strongly agree. With respect to the third section on quality, a score of 1 indicated extremely low quality, 2 means fairly low, 3 is neither high nor low, 4 is fairly high, and 5 is extremely high. The fourth and fifth sections, which asked about the number of relationships and organizations, use a different scale: 1 for none, 2 for less than two, 3 for between three and five, 4 for between six and ten and 5 for more than ten.

Independent random sampling without replacement was used to apply the instrument. Only association members located in the same territory were considered, since the association is composed of members from different geographical areas, in some cases distant -in different cantons or provinces- and who have joined only to obtain benefits linked to fairs for marketing purposes. In addition, the analysis included the examination of the close relationships, whether bonding or bridging relationships that are generated in the same territory, i.e., La Victoria parish.

The Association of Artisans of La Victoria has 129 members (the largest and oldest in the area), of which only 51 live in the parish. The rest, as explained, belong to other more distant areas, so the sample, estimated to be 95% confidence and 5% error, was 45 members, to whom the instrument was applied.

With the information available in the database provided by the president of the association, which included each of the members, their addresses and contact telephone numbers, an appointment was made with the 45 members (of the 51 who live in the area) so that the interviewer could visit each of the members in their homes. To analyze the results, they were statistically validated using Cronbach's Alpha test, in which the values obtained to ensure internal consistency should be as close as possible to unity. First, the results were analyzed by describing the typical characteristics of the sample. Secondly, the levels of social capital were evaluated considering the relational dimension with each of its components and the structural dimension, as well as the assessment of bonding and bridging in each of these dimensions.

To identify the variables affecting the measurement of social capital, the analysis was complemented with an estimation of a multiple linear regression model in accordance with Kaasa & Parts, 2008; Asadullah, 2017; Kaasa, 2019, as follows:

$$SC = \beta_o + \beta_1 age + \beta_2 gender + \beta_3 education + \beta_4 charge + \beta_5 antiquity \qquad (1)$$

Where SC represents the level of social capital, age is the age of each member of the association, $gender$ represents whether the partner is male or female, $education$ is the level of education, $charge$ represents whether or not they hold an office and $antiquity$ is the length of time they have been involved in the association. Moreover, an estimate was made for internal and external relations, using the same explanatory variables. To corroborate the validity of the estimation based on cross-sectional data, so that the estimators are efficient, unbiased, and of minimum variance, tests of homoscedasticity of variance of the error term were applied through the Breusch and Pagan test, the Ramsey test for omitted variables, and the possible relationship of linear dependence between the explanatory variables through the variance inflation factor.

RESULTS AND DISCUSSION

Productive analysis: phases 1 and 2

In the first phase, a diagnosis was conducted through interviews with the president of the Association, which made it possible to identify, at least in broad terms, a series of opportunities, threats, weaknesses and strengths, both of the association and of the artisanal activity. Issues such as the community, products, suppliers, the Association and the sales or income generated by this activity were addressed, which are summarized in Table 1.

Table 1. Diagnosis based on interviews (Source: own elaboration based on data collected in phase 1 and 2)

Community/associative aspects	Productive and management processes	Market/Competition
Seventy percent of the population is engaged in handicrafts and 30 per cent in agriculture. Migration to other cities is high in search of employment. Each artisan works from his or her home. The strategy of working together has not borne fruit, as each artisan sees the others as competitors and there is little collaboration. The handicraft sector could be boosted through the development of tourism projects, but there are no resources or willingness on the part of local governments.	The products produced are linked to utilitarian ceramics, “piñatas,” decorative ceramics (such as flower arrangement bases and vases), as well as tiles. There is only one supplier of clay (raw material). Local clay is not used because of its low quality. Purchases of raw materials are made individually and are not grouped or associated for this purpose, they do not have the capacity to negotiate with the suppliers, they impose the prices because they are the only ones who are able to offer them.	The area is not only home to products made by local artisans, but also to products from Colombia and Peru, whose prices are lower than local products. Tourists and buyers buy them in the belief that they are local products. For roof tiles, the main competitor is the Cuenca tile, which is of better quality, and its price is four times higher, due to its better quality and resistance. There are no collection centres, so sales are made individually.

Additionally, through the interview with the president of the Association, a matrix of weaknesses and strengths, threats and opportunities was structured. The strengths are based on the techniques for handling clay that have been passed down from generation to generation and have allowed the preservation of ancestral knowledge, and in recent years the use of lead in the production of handicrafts has been eliminated, which guarantees the use of the products without side effects for the local population and consumers.

Weaknesses are mainly linked to the fact that, although lead has been eliminated from the products, there has been no improvement in the handicraft process to improve the quality as a whole, which is different among the artisans; furthermore, they depend on a single supplier located in Pujilí, because the quality of the local clay is very poor.

In addition, another important weakness is the absence of promotional strategies to position the product and make it known at the national level, which could even lead to sales opportunities at the international level. In terms of threats, the main one is related to competition from imported products, with lower prices, which are offered as local products, confusing consumers; in addition to this competition, there is also competition from local artisans themselves, who, out of necessity, lower their prices, often despite incurring losses. But there are also opportunities linked to the certification as intangible cultural heritage of Ecuador, which places the area as part of the country's tourist attraction, with a recognized *Finados* Fair, as well as the possibility of designing a tourist route that enhances the sites of interest in the area.

The second phase was based on a participatory diagnosis, due to the socio-economic and cultural characteristics of the area, associated with the need to promote handicraft activities, specifically pottery. This proposal consolidates the operation worked on the fundamental axes of marketing, product mix, evaluation of production and raw materials.

The work session for this participatory diagnosis was carried out with the aim of identifying the existing weaknesses and strengths of the members of the Association, with a view to generating proposals in three basic areas, to subsequently carry out a socio-economic and productive diagnosis through an instrument, identifying opportunities for improvement.

Although negative aspects have been identified in the past, some have been solved, the use of lead in the production of handicrafts, and the lack of organization, since at least the Association has strengthened participation in the *Finados* Fair, which is the main source of income. The positive aspects reflect better economic conditions, linked to greater marketing possibilities, tourism and less competition, as well as an increase in the sale of products in other areas.

The main positive aspects of the present situation are linked to the willingness to take on innovative technologies, procedures, products and even the strengthening of existing capacities, to generate more attractive products that can access new markets. In terms of this, knowledge of consumers and competition is identified as a need, as well as access to long-term credits with preferential rates that allow for the introduction of the required improvements.

The vision of the future does not change significantly in relation to the current situation; there is a desire to preserve the cultural identity, and the pottery tradition supported by the generations of parents and grandparents, which has been reinforced with the certification as intangible heritage of Ecuador. In addition, the presence of the Association and the *Finados* Fair as a crucial point in the commercialization process are reiterated as positive aspects. The negative aspects that can be identified in the future are related to the risks of losing ancestral knowledge, techniques and the cultural heritage of the area over time, as many young people, not seeing that the activity is profitable, choose to migrate to other areas in search of employment. There is also evidence of the need to improve, increase production and broaden access to markets, but to do so they must improve the quality of the product and innovate in other areas. Once the instrument was applied, its internal consistency was first validated through Cronbach's Alpha, obtaining a value of 0.8795.

Since this is close to 1, it indicates the statistical consistency of the responses. After determining the validity of the instrument, the overall results show that most of the members (87.80%) do not hold managerial positions in the association, 53.65% are women, more than half have only basic education (65.85%), while 17.07% have studied at university or another higher education institution. With respect to the age of the members, 73.17% are over 45 years old while only 12.19% are under 30 years old. This shows that pottery is an activity conducted by middle-aged and older people. Regarding length of time in the association, the majority has been a member for at least 5 years (82.29%), and specifically, 29.26% have been part of it for more than 20 years (although informally, as the association was registered in 2008). Only a few have worked in the association for less than one year (2.43%).

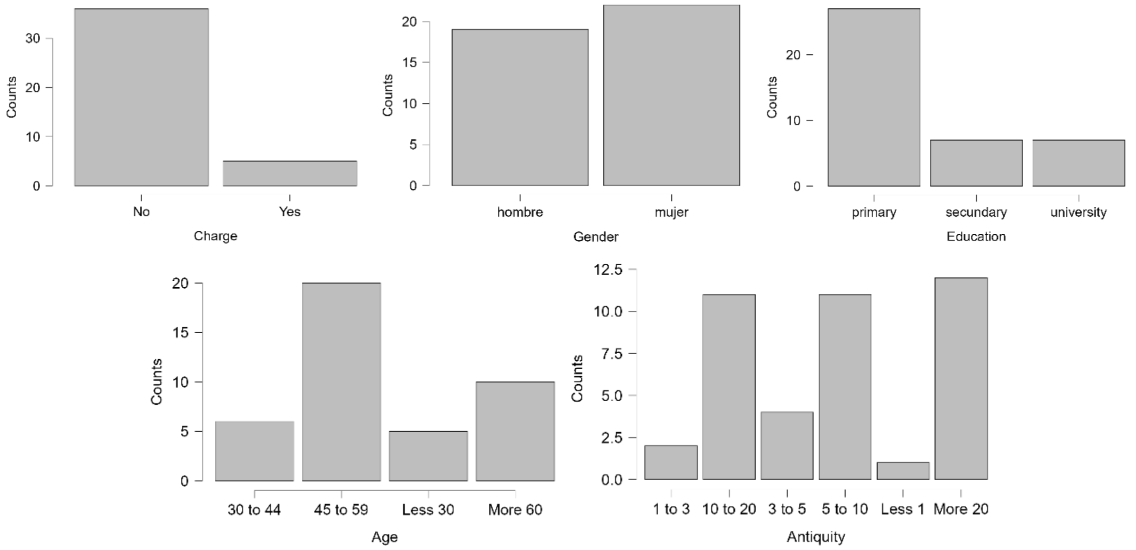

Figure 2. Socio-demographic characteristics of members (Source: own elaboration based on social capital survey)

Social capital evaluation - Phase 3

When analyzing the results linked to the perspectives of social capital addressed in this study, the relational dimension of the social structure perspective was taken as the starting point. The evaluation of the quality of horizontal relationships (both bonding and bridging), as well as the components considered, associated with information and communication, trust, cooperation, participation, commitment, and linkage with the environment, show results that are between 3 and 4 points (with the maximum being 5 points and the minimum 1), as shown in Table 2.

Table 2. Ratings of the components of the relational dimension (social structure perspective) for horizontal, bonding, and bridging relationships (Source: own elaboration based on social capital survey)

Dimensions	Average Horizontal Relationships	Average Bonding	Average Bridging
Relational dimension	3.6720	3.8902	3.7588
	(0.4424)	(0.4713)	(0.5603)
Information and communication	3.7121	4.3780	3.2682
	(0.9879)	(0.9860)	(1.2023)
Confidence	3.6036	3.6097	3.5853
	(1.2221)	(1.2929)	(1.2840)
Cooperation	3.1646	3.2621	3.6991
	(0.6010)	(0.7069)	(0.7333)
Participation	3.8634	3.8719	3.8292
	(0.8215)	(0.8064)	(1.1811)
Commitment	4.3804	4.3821	4.3780
	(0.6046)	(0.6979)	(0.9668)
Surrounding	3.8150	3.8373	3.7926
	(0.5366)	(0.5342)	(0.5649)

Note: Values in parentheses represent standard errors

In general terms, they are all above 3 points. The highest average was commitment with 4.38, followed by participation with 3.86, surrounding with 3.82, information and communication with 3.71, confidence with 3.60, and the lowest was cooperation with 3.16. Thus, considering the ratings of these components, the relational dimension in this way stands at 3.672 for all relationships. For bonding relationships, on average, the relational dimension is better rated with 3.8902, while bridging relationships scored 3.7588. It is possible to identify the greatest difference in the results in favor of the first type of relationship in the information components, and in favor of bridging relationships in the cooperation component. Thus, bonding relationships, with family and close friends, are characterized by a higher level of information and communication, while bridging relationships, with the non-close environment, had higher scores for cooperation. In both cases, commitment is the highest scoring component.

Although the ratings are between 3 and 4 points in a similar way, when analyzing the components of relationships' quality, the high rating was trust with immediate family members (4.7073) and the lowest was trust with friends (2.9756), whereas the average rating of the quality of bonding relationships was 3.8414, while for bridging relationships, the average quality score was 3.6292, lower than the quality of close relationships. These results allow us to estimate an average value for the quality of relationships of 3.6898, like the assessment of the relational dimension through the components identified above.

If we contemplate the second dimension of the social structure perspective, related to the number of ties or participation in formal networks or organizations, the average number of horizontal relationships with people in the family and association environment is on average 3.6167 (between 3 and 10 people), while the number of relationships with other associations is just 1.6341 on average, which represents less than 2 associations. The greatest number of relationships are identified with friends (4.0243) and with people in the association who have no position or responsibility (4.1463), and to a lesser extent with people in other organizations without a position (3.1707) or with a position (3.2439) and with family (3.2195).

If relationships are grouped according to closeness, the average for personal relationships of the bonding type is 3.6219, and in the case of less close relationships of the bridging type, with other people or organizations, the average was 3.01487.

According to Woolcock & Narayan (2000), and then Esparcia et al. (2016), these results of internal and external relations could be analyzed graphically by considering their position in any of the four quadrants that are generated from segmenting according to the values from which the results are considered good or very good- in this case 4 and upwards, since 3 is considered ‘regular’. As shown in Figure 3, the first quadrant with low values of both bonding and bridging denotes that the community or organization is not very related and not very cohesive; the second quadrant signifies that although external relations are strong (values above the acceptable value), internal relations are weak.

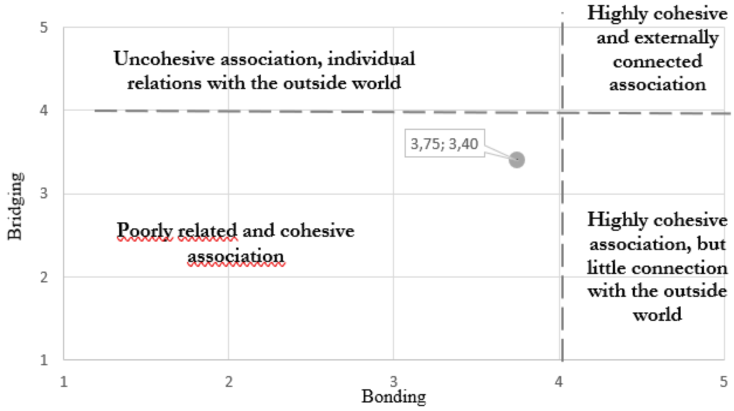

Figure 3. Association between internal relations (bonding) and external relations (bridging)
(Source: own elaboration based on social capital survey)

The third quadrant, with above-average values for internal relationships, shows that cohesion is high but lacks exchange with other organizations; finally, the fourth quadrant implies a cohesive association strongly related to the environment.

In the case of the Association of La Victoria Artisans, the assessment of both types of relationships places it in the first quadrant, in which the associations do not have the necessary conditions to promote processes of territorial development, which Woolcock defines as isolation or "amoral individualism", not taking advantage of the benefits of association or public institutions or policies. The average of the bonding relationships in both the structural and relational dimensions was 3.75, while for the bridging relationships it was 3.40.

Determinants of social capital - Phase 4

To complement the analysis and identify the variables that could influence the results obtained for the relational dimension (social capital, information and communication, confidence, cooperation, participation, and commitment), an estimation by ordinary least squares was realized, the results of which are presented in Table 3.

Table 3. Estimation of ordinary least squares for the values of relational dimension of the social capital (Source: own elaboration based on social capital survey)

Variables	Relational Dimension	t	Relational Bonding	t	Relational Bridging	t
Charge	-0.1402	-0.61	-0.3260	-1.39	-0.0474	-0.16
	(0.2284)		(0.2344)		(0.2918)	
Antiquity	-0.0407	-0.69	-0.0717	-1.20	-0.2083	-0.28
	(0.0587)		(0.0599)		(0.0746)	
Age	0.0390	-0.37	0.0383	0.36	0.1057	0.80
	(0.1042)		(0.1065)		(0.1326)	
Gender	0.2633*	1.70	0.2306	1.45	0.3798*	1.92
	(0.1552)		(0.1586)		(0.1975)	
Education	-0.0624	-0.54	-0.1128	-0.95	-0.0317	-0.22
	(0.1156)		(0.1182)		(0.1471)	
Constant	3.7176***	7.79	4.1966***	8.60	3.4024***	5.60
	(0.4775)		(0.4880)		(0.6075)	

Note: Significant at: 1% (***), 5% (**), 10% (*). Values in parentheses represent standard errors

The results show that, in the case of the relational dimension in general terms, without considering the type of relationship, only gender was significant at 10%, meaning that women increase social capital from the relational dimension. When considering the type of relationship, none of the variables was significant in union relationships, while in bridge relationships gender has a positive impact. For each of the estimations, the potential problems of heteroscedasticity, omitted variables, and presence of multicollinearity were discarded through the Breusch and Pagan test, the Ramsey test, and the variance inflation factor (VIF), respectively.

By performing a similar analysis, but to explain the behavior of the structural dimension in general terms, of union-type relationships and bridge-type relationships, considering the variables of position, seniority in the association, age, gender, and educational level, the results shown in Table 4 were obtained.

Table 4. Estimation of ordinary least squares for the values of structural dimension of the social capital (Source: own elaboration based on social capital survey)

Variables	Structural Dimension	t	Structural Bonding	t	Structural Bridging	t
Charge	-0.2478	-1.15	0.3807	0.91	-0.4274	-1.71
	(0.2154)		(0.4171)		(0.2493)	
Antiquity	-0.0453	-0.82	-0.1686	-1.58	-0.0100	-0.16
	(0.0551)		(0.1067)		(0.0637)	
Age	-0.0404	-0.41	-0.4144**	-2.19	0.0663	0.59
	(0.0979)		(0.1896)		(0.1133)	
Gender	0.1196	0.82	-0.1823	-0.65	0.2059	1.22
	(0.1458)		(0.2823)		(0.1687)	
Education	-0.0086	-0.08	-0.3606*	-1.71	0.0919	0.73
	(0.1086)		(0.2103)		(0.1257)	
Constant	3.4786***	7.75	6.1750***	7.11	2.7081***	5.22
	(0.4485)		(0.8684)		(0.5190)	

Note: Significant at: 1% (***), 5% (**), 10% (*). Values in parentheses represent standard errors

Only in the structural dimension for union-type relationships did age (at 5%) and educational level (at 10%) prove to be significant. In the first case, an increase in age and educational level reduced the evaluation of the structural dimension of the union relationships. In the structural dimension in general terms and for bridge-type relationships, no significant variables could be identified. Similarly, tests were applied to identify potential problems of heteroscedasticity, multicollinearity, or omission of variables (Figure 4).

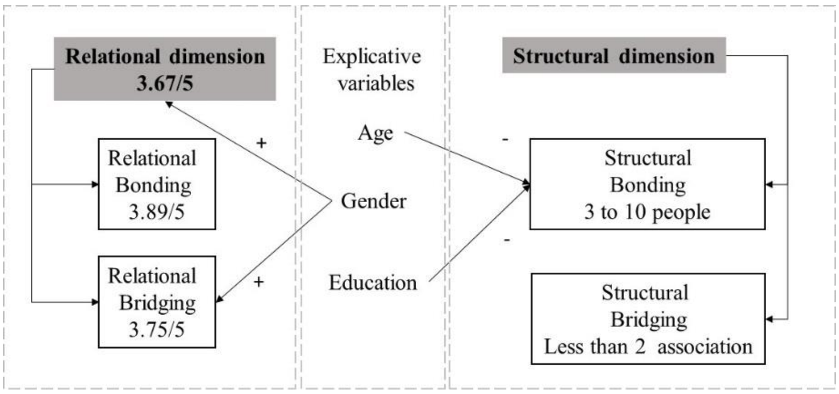

Figure 4. Principal results (Source: own elaboration based on social capital survey)

As shown in Figure 4, the ratings received for the relational dimension exceed the mean value of the scale, but it is the close bonding type relationships that are shown to be the most cohesive and strengthened. Specifically, these relationships cannot be explained by the variables used in the analysis, while bridging relationships and the general average of the dimension increase with gender, so that being a woman improves (between 0.26 and 0.37 points) the levels of relational capital associated with less close ties.

Similar results are identified in the structural dimension, in which the number of close relationships is higher than those of bridging links. In the first case, an average of 3 to 10 people are present, while in the second case, less than 2 associations or organizations to which one belongs are identified. It is the bonding-type structural dimension that is explained by variables such as age and educational level. An increase in age reduces the number of close relationships by 0.41 points, while an increase in educational level also contributes to a decrease of 0.36 points.

In the case of La Victoria, considered a territory that has specialized in the production of clay handicrafts, the current economic conditions demand those possibilities be identified to strengthen associations and hence improve living conditions and income levels, thereby reducing migration and the loss of culture, artistic heritage, and ancestral knowledge.

The Association of La Victoria Artisans is an organization that was formally created in 2008, although informally it dates back more than 30 years. This jump to formality took place as a mechanism to generate a strategy of association through the creation of marketing channels for their products, derived from working with clay, such as vases, *piñatas*, utilitarian ceramics, roof tiles, pots, and so on. So far, other advantages of the formal associative process have not been evidenced, such as the reduction of input costs, the search for markets or the technification of the processes; indeed, the expectations of the associates are not very optimistic regarding the improvement of their economic situation, the new generations are disinterested in pottery, and there is a high volume of migration to other areas in search of employment.

Given this reality, this study made it possible to analyze social capital from the social structural perspective through the relational dimension (quality of relationships) and the structural dimension (quantity of relationships); in addition, the network perspective was approached by considering only the horizontal relationships of bonding and bridging, and in them the quality and quantity of these relationships were evaluated. With no evidence of previous studies on the measurement of social capital in any of its dimensions in Ecuador, and no studies regarding this specific association, the methodological proposal by Mujika et al. (2010) was used to evaluate horizontal social capital under the social structural perspective.Considering the relational dimension, the levels of commitment to both close and bridge-type relationships are higher, there are values such as trust, cooperation, and information that can limit the actions of the association and the formal structure, conditioning the appropriation of resources derived from instrumental social capital (Atria, 2003; Lin, 2008; Hernández et al., 2021).

These results are corroborated when the members were asked specifically about the perception they have of the quality of these relationships; this highlights the need to strengthen the relationships within the association as a strategy for the appropriation of instrumental resources (Lin, 2008), based on trust as a requirement for the consolidation of social capital (Atria, 2003). As for the structural dimension, linked to the number of relationships, at the micro or personal level, on average they have at least 5 relationships, while the number of relationships with other associations is quite limited and is reduced to less than 2, thus limiting the appropriation of new resources or the strengthening of instrumental social capital. Based on what Woolcock & Nayaran (2000) propose, the association's cohesion is stronger than its links with others, but in any case, it is considered independent and poorly organized (Figure 4).

Thus, it is evident that although internal or close relationships are better valued in relational and structural terms, relationships within the association are not strengthened, and are even worse if relationships with other associations are considered. This, despite being in the presence of a formal network or association, limits the possibilities of generating tangible and intangible benefits from participation in networks (Nahapiet & Ghoshal, 1998; Atria, 2003; Lin, 2008; Casson & Giusta, 2007; Casanueva et al., 2010; Prayitno et al., 2023). In the manner of Granovetter (1985), the rooting processes (internal relations) have not been strengthened and therefore openness (external relations) with other associations or organizations in the environment has not been achieved. But these relations, resources, and values will depend on demographic variables, such as age, education or gender (Christoforou, 2005; Kaasa & Parts, 2008; Asadullah, 2017; Kaasa, 2019). To identify possible explanatory variables for the described behaviors, ordinary least squares estimations (or robust error correction if necessary) were performed for the average relational dimension and in terms of bonding and bridging, the general structural dimension, and for close and external relationships.

As regards the relational dimension, gender explains behavior both in general terms and in bridging relationships, so that women increase the valuation of social capital in terms of the quality of relationships, in contrast to what is proposed by authors such as Alesina & La Ferrara (2002) or Christoforou (2005). This difference in results is related in the first place to the dependent variable used as a measure of social capital. Alesina & La Ferrara (2002) considered trust, while Christoforou (2005) used group participation, whereas in this case, the relational dimension was analyzed.

Second, the characteristics of the productive activity and the ethnic and cultural component of the territory mean that making handicrafts and pottery is mostly in the hands of women who have maintained the tradition, despite the problems they confront. From a gender perspective, this is related to the typical roles of people, which are accentuated in rural territories and particularly in the province of Cotopaxi due to the importance of the indigenous component. Women must then focus on reproduction and community management, while men focus on productive and political decision-making roles (Mosquera, 2018; Hernández et al., 2021). With respect to the results of the structural dimension (number of relationships), only significant variables were identified in the explanation of bonding relationships.

At higher age and educational level, the valuation of structural social capital of internal relationships is reduced, as proposed by Katungi et al. (2007); Kaasa (2019), who indicate that it is young people who participate more in networks or organizations. Meanwhile, results for educational level in literature differ, although Christoforou (2005) and Katungi et al. (2007) indicate that more education means increased participation; Alesina & La Ferrera (2002) for their part identify an inverse relationship between trust and training.

Thus, any intervention aimed at building or strengthening social capital requires increasing the number of relationships, but also their quality, considering the cognitive component, norms, values and communication codes. In order to identify strategies or actions that strengthen this social capital, the proposal starts from the initial need to build community social capital, where social networks (grassroots or community organizations) and the relationships between them are of vital importance and must be encouraged through public policies and the promotion of community participation.

Rodríguez & Quintero (2018) elaborate on this aspect and propose that at the community level it is vital that leaders can generate strategies that enable these inter-organizational relationships based on the processes of training and exchange between them. This can be strengthened through the social management of knowledge, recognized by Aponte & Vásquez (2020), who propose that the creation of a cognitive space can lead to the construction of community social capital. This internal social capital (bonding) as well as bridging requires concrete actions that are also related to training through socio-educational networks (Díaz & Civís, 2011), the incorporation of strategic communication, conflict management, collective decision-making (Rodríguez & Quintero, 2018) and even technology and digital aspects (Jafari, 2019).

As for the structuring of socio-educational networks (Díaz & Civís, 2011), they are based on the formation of a formal organizational network with a formative purpose. These socio-educational networks are 'oriented towards common socio-educational goals, which base their action on cooperation through joint strategic programming and are promoters of social capital' (Diaz & Civís, 2011). The network therefore pursues work on the dimensions of trust, social organization, voluntarism, commitment to the public sphere and tolerance of diversity. As Jafari (2019) argues, an under-explored issue is digital social capital, where emphasis has been placed on internet social capital, through studies that demonstrate a direct relationship between internet use and improved relationships. It is therefore proposed that micro-enterprises and social production organizations can leverage social networks to enhance links with suppliers and customers, and even among their own collaborators, facilitating strategic communication and decision-making.

CONCLUSION

The results of this study show that social capital in the Association of Artisans of La Victoria is characterized by a strong presence of bonding social capital, based on trust and reciprocity among its members. However, bridging social capital, crucial for the expansion of markets and access to institutional networks, is limited, which restricts the association's capacity to insert itself into more competitive economic dynamics. Demographic factors such as gender, age and educational level influence the configuration of social capital, highlighting the role of women in the consolidation of internal networks, while age and education affect participation in external relations.

The absence of marketing strategies and the scarce articulation with external actors represent significant challenges for the economic sustainability and preservation of the artisanal heritage. Based on these findings, it is recommended to strengthen linkage strategies with public and private institutions, encourage training in digital marketing and promote cooperation spaces with other craft associations. The consolidation of external networks would make it possible to diversify markets, improve economic resilience and reinforce the intergenerational transmission of craft knowledge. It is also essential that public policies support the solidarity economy through incentives for the formation of productive networks and the recognition of crafts as a key sector for local development.

While this study provides a comprehensive assessment of social capital in the Association of Artisans of La Victoria, it has certain methodological and contextual limitations that need to be considered when interpreting the results. First, the research is based on a cross-sectional approach, which prevents us from assessing the evolution of social capital and its impact on sustainability over time. A longitudinal analysis would allow identifying changes in the association's internal and external relations, as well as in its economic and organizational performance. Secondly, the sample is limited exclusively to the artisans who are members of the association, without including other relevant actors in the productive ecosystem, such as suppliers, clients or governmental entities.

This restricts the possibility of understanding how external networks and institutional factors influence the dynamics of social capital. Furthermore, the study relies on self-assessments and subjective perceptions, which may introduce social desirability biases and affect the accuracy of the results. Finally, the lack of previous studies on social capital in Ecuadorian craft associations makes it difficult to compare with other contexts and to generalize the findings. It is recommended that future research incorporates comparative analyses with other associations and a longitudinal assessment of the impact of social capital on the economic and cultural sustainability of artisans.

Author Contributions: Conceptualization, P.H.M; methodology, P.H.M and D.P.R.; software, P.H.M and M.A.P.H; validation, L.F.G. and M.A.P.H.; formal analysis P.H.M. and D.P.R.; investigation, L.F.G. and D.P.R.; data curation, P.H.M and M.A.P.H; writing - original draft preparation, P.H.M and D.P.R.; writing - review and editing, L.F.G. and M.A.P.H; visualization, D.P.R.; supervision, P.H.M; project administration, P.H.M. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgments: We thank the members of the Association of Artisans of La Victoria for providing the information for the development of this research.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Alburquerque, F. (2004). Desarrollo económico local y descentralización en América Latina [Local economic development and decentralization in Latin America]. *Revista de la CEPAL*, 82, 157-171 (In Spanish).

Alesina, A., & La Ferrara, E. (2002). Who trusts others? *Journal of public economics*, *85*(2), 207-234. https://doi.org/10.1016/S0047-2727(01)00084-6

Alvarez, C. (2017). Saberes del Territorio en la economía solidaria: aprendizajes para un desarrollo endógeno del Buen Vivir [Knowledge of the Territory in solidarity economy: learning for an endogenous development of the Good Living]. *Cooperativismo & Desarrollo*, *25*(111), 11-19 (In Spanish). https://doi.org/10.16925/co.v25i111.1769

Annoni, D., De Souza Silva, K., & Santos, G. (2021). Solidarity Economy and social inclusion The Immigrant Fair in Florianópolis, Brazil. *Development Policy Review*, 40(2), e12564. https://doi.org/10.1111/DPR.12564

Aponte-Jaramillo, E., & Vásquez-Rizo, F. E. (2020). Educación y gestión social del conocimiento para la construcción de capital social [Education and social management of knowledge for the construction of social capital]. *Educação & Sociedade*, 41, 1-13 (In Spanish). https://doi.org/10.1590/ES.226119

Ariffin, W., Shahfiq, S., Ibrahim, A., Pauzi, H., & Rami, A. (2023). Preservation of craft heritage and its potential in youth economic empowerment. *Planning Malaysia*, 21(30), 157-169. https://doi.org/10.21837/pm.v21i30.1393

Arinta, D., Sumarmi, Budijanto, & Susilo, S. (2023). Development of integrated and sustainable community based eco-tourism on Sipelot beach, Indonesia. *GeoJournal of Tourism and Geosites*, 46(1), 19–26. https://doi.org/10.30892/gtg.46102-996

Asadullah, M. N. (2017). Who trusts others? Community and individual determinants of social capital in a low-income country. *Cambridge Journal of Economics*, *41*(2), 515-544. https://www.jstor.org/stable/44488739

Atria, R. (2003). Capital social: concepto, dimensiones y estrategias para su Desarrollo [Social capital: concept, dimensions and strategies for its development]. In *Capital social y reducción de la pobreza en América Latina y el Caribe: en busca de un nuevo paradigma (pp. 581-590)*. CEPAL, Chile.

Awad, A. H. I., Elnaggar, M. K., El-Halim, A. A. E. K. G. A., Ahmed, M. F. A. E. L., & Wahba, S. A. M. (2024). The moderating role of internal marketing on the relationship between organizational trust and job engagement: evidence from hotels and travel agencies. *GeoJournal of Tourism and Geosites*, 53(2), 554–563. https://doi.org/10.30892/gtg.53219-1231

Bourdieu, P. (1985). The forms of capital. In *Handbook of Theory and Research for the sociology of education* (pp. 241-258). Greenwood, New York.

Casanueva, C., Castro, I., & Galán, J. L. (2010). Capital social e innovación en clusters industriales [Social capital and innovation in industrial clusters]. *Revista Europea de Dirección y Economía de la Empresa*, 19(4), 37 – 58 (In Spanish).

Casson, M., & Giusta, M. (2007). Entrepreneurship and Social Capital. Analysing the Impact of Social Networks on Entrepreneurial Activity from a Rational Action Perspective. *International Small Business Journal*, 25(3), 220- 244. https://doi.org/10.1177/0266242607076524

Christoforou, A. (2005). On the Determinants of Social Capital in Greece Compared to Countries of the European Union. *SSRN*, May, 1-37. http://dx.doi.org/10.2139/ssrn.726142

Coleman, J. (1990). *Foundations of social theory*. Belknap Press of Harvard University Press, Cambridge, 979 p.

Díaz, J., & Civís, M. (2011). Redes Socioeducativas promotoras de capital social en la comunidad: un marco teórico de referencia [Socio-educational networks promoting social capital in the community: a theoretical framework of reference]. *Cultura y Educación*, 23(3), 415-429 (In Spanish). https://doi.org/10.1174/1135640117973302

Duxbury, N., Bakas, F. E., & Carvalho, C. P. (2024). Participatory knowledge co-production to activate culture in the development of small cities and rural areas in Portugal. *Social Enterprise Journal*, 20(2), 159-180. https://doi.org/10.1108/SEJ-12-2022-0116

Egorov, V., Inshakov, A., Chigarev, V., & Aleksandrova, E. (2022). Social Cooperatives as an Element of Solidarity Economy. *WISDOM*, *23*(3), 187–199. https://doi.org/10.24234/wisdom.v23i3.725

Esparcia, J., Escribano, J., & Serrano, J. (2016). Una aproximación al enfoque del capital social y a su contribución al estudio de los procesos de desarrollo local [An approach to the social capital approach and its contribution to the study of local development processes]. *Investigaciones Regionales - Journal of Regional Research*, 34, 49-71.

Forero, J., & Saavedra, J. (2022). Community-based tourism as an approach to a solidarity economy. *European Conference on Management Leadership and Governance*, 18(1), 340-346. https://doi.org/10.34190/ecmlg.18.1.717

Granovetter, M. (1985). Economic action and social structure: the problem of embeddedness. *American Journal of Sociology*, 91, 481-510. https://www.jstor.org/stable/2780199

Hernández, P., Ramírez, G., & Peñaherrera, S. (2021). Empowerment and female entrepreneurship, a rural-urban comparison, Canton Latacunga, Cotopaxi Province. *Revista de Estudios Regionales*, 122, 173-199.

Hernández-Medina, P., & Gurría-Gascón, J. (2024). *Desarrollo sostenible: dimensiones social y económica* [Sustainable development: social and economic dimensions], Editorial UNACH, Ecuador, 224p. https://doi.org/10.37135/u.editorial.05.139

Hernández-Medina, P. (2025). Interplays of Institutional, Economic, Social and Environmental Systems in Sustainable Development in Latin America. *Journal of Sustainability Research*, 7(1), e250007. https://doi.org/10.20900/jsr20250007

Ibourk, A., & Raoui, S. (2022). Impact of cooperative entrepreneurship on territorial human development in Morocco – Spatial analysis. *International Journal of Social Economics*, 49(6), 914-929. https://doi.org/10.1108/ijse-03-2021-0145

Jafari, S., & Moharrami, R. (2019). *Conceptualizing digital social capital*, International Seminar on New Topics in Business Management, Varna University of Management, Bulgaria, 10 p.

Kaasa, A., & Parts, E. (2008). Individual-Level Determinants of Social Capital in Europe. *Acta Sociológica*, 51(2), 145–168. https://doi.org/10.1177/000169930809004

Kaasa, A. (2019). Determinants of individual-level social capital: Culture and personal values. *Journal of International Studies*, 12(1), 9-32. https://doi.org/10.14254/2071- 8330.2019/12-1/1

Katungi, E., Machethe, C. L., & Smale, M. (2007). Determinants of social capital formation in rural Uganda: Implications for group-based agricultural extension approaches. *African Journal of Agricultural and Resource Economics*, 1(2), 167-190. http://dx.doi.org/ 10.22004/ag.econ.57016

Knack, S., & Keefer, P. (1997). Does social capital have an economic payoff? A cross-country investigation. *The Quarterly journal of economics*, 112(4), 1251-1288. https://www.jstor.org/stable/2951271

Kutsenko, V., Kinash, I., & Yevtushenko, H. (2021). Social dominants as a core for the development of territorial communities on an innovative basis (synergetic aspect). *Environmental Economics and Sustainable Development*, 10(29), 87-97. https://doi.org/10.37100/2616-7689.2021.10(29).11

Lan, T., Zheng, Z., Tian, D., Zhang, R., Law, R., & Zhang, M. (2021). Resident-Tourist Value Co-Creation in the Intangible Cultural Heritage Tourism Context: The Role of Residents' Perception of Tourism Development and Emotional Solidarity. *Sustainability*, 13(3), 1-20. https://doi.org/10.3390/SU13031369

Lee, S. (2020). Role of social and solidarity economy in localizing the sustainable development goals. *International Journal of Sustainable Development & World Ecology*, 27, 65 - 71. https://doi.org/10.1080/13504509.2019.1670274

Lin, N. (2008). A Network Theory of Social Capital. In *The Handbook of Social Capital* (pp. 50-69). Oxford University Press, New York.

Manríquez, N., Martínez, F., & Colín, S. (2017). Reflexiones en torno a la economía solidaria: una revisión de la literatura [Reflections on the solidarity economy: a review of the literature]. *Iztapalapa Revista de Ciencias Sociales y Humanidades*, 38 (83), 11-42 (In Spanish).

Marconatto, D., Ladeira, W., & Wegner, D. (2019). The sustainability of solidarity economy organizations: An empirical investigation. *Journal of Cleaner Production*, 228, 1122-1130. https://doi.org/10.1016/J.JCLEPRO.2019.04.352

Menezes, D. (2021). Economia solidária e inovação social: comparação entre Brasil e Bolívia [Solidarity economy and social innovation: a comparison between Brazil and Bolivia]. *Revista de Estudos Universitários* - REU, 47(1) 177-196 (In Portuguese). https://doi.org/10.22484/2177-5788.2021V47N1P177-196

Mosquera, V. (2018). *Comunidad, Estado y subjetivación, La participación de mujeres indígenas en Ecuador* [Community, State and subjectivation, The participation of indigenous women in Ecuador], FLACSO Ecuador – Abya Yala, Ecuador, 319 p.

Mujika, A., Ayerbe, M., Ayerbe, O., & Navarro, I. (2010). *Manual para la autoevaluación del capital social en las organizaciones*. Deusto: Fundación Deusto, (In Spanish).

Nahapiet, J., & Ghoscal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *The Academy of Management Review*, 23 (2), 242-266. http://www.jstor.org/stable/259373

Piani, L., & Curiazi, R. (2024). Activating Solidarity-Economy Territories: Towards a 'Differently-New' Economic Approach: The Case of the Friuli Venezia Giulia Region (Italy). *Sustainability*, 16(16), 1-28. https://doi.org/10.3390/su16167050

Pebrianto, M., Yuliati, Y., Kustanti, A., Sukesi, K., Hidayat, K., & Kurniawati, E. (2024). Development strategy towards a self-sustaining village based on SDGs through the tourism potential of Samar Village, Pagerwojo District. *Geojournal of Tourism and Geosites*, 57(4spl), 2123–2132. https://doi.org/10.30892/gtg.574spl26-1379

Prayitno, G., Dinanti, D., Wisnu Adrianto, D., Rahmawati, R., Auliah, A., & Eka Wardhani, L. (2023). The influence of social capital in improving the quality of life of the community in Sidomulyo tourism village, Indonesia. *GeoJournal of Tourism and Geosites*, 46(1), 208–217. https://doi.org/10.30892/gtg.46123-1017

Putnam, R. (1993). What makes democracy work? *National Civic Review*, *82*(2)101-107. https://doi.org/10.1002/ncr.4100820204

Ramírez, C., Martínez, L., & Calderón, L. (2016). Capital Social Empoderamiento en mujeres para disminución de pobreza en Colombia [Social Capital Empowering women to reduce poverty in Colombia]. *Revista Venezolana de Gerencia*, *21*(76), 693-708 (In Spanish).

Rodríguez, R., & Quintero, R. (2018). Estrategias de los líderes de organizaciones sociales en la construcción de capital social [Strategies of leaders of social organizations in building social capital]. *Revista Iberoamericana de las Ciencias Sociales y Humanísticas*, 7 (13), 155-179 (In Spanish). https://doi.org/10.23913/ricsh.v7i13.144

Ruiz-Palacios, M. A., Pereira-Teixeira-De-Oliveira, C., Tejada-García, M. A., Salvador-García, C. R., Velasquez- Viloche, L., & Cordova-Buiza, F. (2024). Culture, rituals and nature: experiences of mystical tourism in northern Peru. *Geojournal of Tourism and Geosites*, 56(4), 1845–1855. https://doi.org/10.30892/gtg.56438-1352

Sabatini, F. (2005). *Measuring social capital in Italy: an exploratory analysis*, Working Paper Series 12, University of Bologna, Italy, 45p.

Sadykov, R., & Akhmetov, V. (2022). Economic territory system socialisation as society development factor. *Vestnik Universiteta*, 2022(1),14-20. https://doi.org/10.26425/1816-4277-2022-1-14-20

Salim, J., Anuar, S., Omar, K., Mohamad, T., & Sanusi, N. (2023). The Impacts of Traditional Ecological Knowledge towards Indigenous Peoples: A Systematic Literature Review. *Sustainability*, 15(1), 1-22. https://doi.org/10.3390/su15010824

Salinas, J., & Sastre-Merino, S. (2021). Social Capital as an Inclusion Tool from a Solidarity Finance Angle. *Sustainability*, 13(13), 1-22. https://doi.org/10.3390/su13137067

Sen, A. (2000). *El desarrollo como libertad. Los fines y los medios del desarrollo*. Buenos Aires: Editorial Planeta, (In Spanish).

Soares, M., Leocádio, Á., & Rebouças, S. (2020). Complexity and social capital in solidarity economy: an empirical evidence of enterprises in Brazil. *International Journal of Entrepreneurship and Innovation Management*, 24(2/3), 210-231. https://doi.org/10.1504/ijeim.2020.10027227

Trigilia, C. (2001). Social Capital and Local Development. *European Journal of Social Theory*, 4(4), 427–442. https://doi.org/10.1177/13684310122225244

Vieta, M., & Heras, A. (2022). Organizational solidarity in practice in Bolivia and Argentina: Building coalitions of resistance and creativity. *Organization*, 29, 271 - 294. https://doi.org/10.1177/13505084211066813

Woolcock, M., & Narayan, D. (2000). Social Capital: Implications for development theory, research and policy. *The World Bank Research Observer*, *15*(2), 225-249.

Article history: Received: 24.01.2025 Revised: 07.05.2025 Accepted: 30.05.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1119-1127
DOI 10.30892/gtg.602spl09-1485

GENERATION Z CUSTOMERS' ONLINE OUTBOUND TOURISM BOOKING INTENTION IN VIETNAM: EXTENDING THE TECHNOLOGY ACCEPTANCE MODEL WITH INTERCULTURAL COMPETENCE

Anh Viet TRAN [1], **Bui Thanh KHOA** [2*]

[1] Hung Vuong University of Ho Chi Minh City, Ho Chi Minh City, Vietnam; tvanh@dhv.edu.vn (A.V.T.)
[2] Industrial University of Ho Chi Minh City, Business and Management Research Group, Ho Chi Minh City, Vietnam; buithanhkhoa@iuh.edu.vn (B.T.K.)

Citation: Tran, A.V., & Khoa, B.T. (2025). Generation Z customers' online outbound tourism booking intention in Vietnam: Extending the technology acceptance model with intercultural competence. *Geojournal of Tourism and Geosites*, 60(2spl), 1119–1127. https://doi.org/10.30892/gtg.602spl09-1485

Abstract: This study explored the factors influencing Generation Z (Gen Z) customers' intentions to book outbound tourism online in Vietnam. Recognizing Gen Z as digital natives and a pivotal demographic, especially within Vietnam's rapidly expanding digital and outbound tourism sectors, this research aimed to comprehensively understand their online booking behaviors. The theoretical framework was built upon the Technology Acceptance Model (TAM), which was extended to include intercultural competence as a crucial external variable. This integration allowed for an examination of how perceived usefulness, perceived ease of use, attitude, and intercultural competence collectively shape Gen Z's intentions to book outbound tourism online. To achieve this, a structured survey was administered to 312 Vietnamese Gen Z respondents. The collected data underwent rigorous analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings provided compelling evidence that all core TAM constructs—perceived usefulness, perceived ease of use, and attitude—exerted a significant influence on online outbound booking intentions. Notably, attitude emerged as the strongest predictor, highlighting the profound impact of a positive mindset towards online booking platforms, followed closely by perceived usefulness, which underscores Gen Z's pragmatic approach to technology. A key contribution of this research lies in demonstrating the significant role of intercultural competence. The results revealed that intercultural competence positively impacted perceived ease of use, perceived usefulness, and, critically, directly influenced booking intentions. This underscores its pivotal role in facilitating cross-cultural consumer interactions and enhancing the overall online booking experience for international travel. Theoretically, this study enriches the existing literature by extending TAM with intercultural competence, thereby addressing a gap in understanding the role of cultural adaptability in technology adoption behaviors, particularly in the context of international services. Practically, these findings offer invaluable insights for tourism platforms and marketers targeting the Vietnamese Gen Z demographic. The research emphasizes the paramount importance of developing user-friendly interfaces that resonate with digital natives, creating culturally adaptive content that acknowledges and caters to cross-cultural nuances, and implementing targeted marketing strategies that effectively communicate the benefits and ease of online outbound tourism booking.

Keywords: Generation Z, Technology Acceptance Model, intercultural competence, online booking, Vietnam

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INTRODUCTION

The rapid advancement of information technology has revolutionized the global tourism industry. Online booking platforms have emerged as indispensable tools for facilitating travel arrangements, offering convenience, accessibility, and personalized experiences for consumers worldwide (van der Heijden et al., 2017; Bakos & Treacy, 1986). In Vietnam, the increasing adoption of digital platforms has paralleled the burgeoning growth of the tourism sector, particularly among Generation Z (Gen Z), a cohort known for its digital fluency and global connectedness. Gen Z, typically defined as individuals born between 1997 and 2012, represents a distinct demographic with unique consumer behaviors, characterized by their reliance on technology, preference for user-friendly interfaces, and demand for personalized services (Ali et al., 2022). As Gen Z matures into an influential consumer group, their online outbound tourism booking behaviors warrant scholarly attention. Given Vietnam's significant economic growth and its embrace of digital transformation, the tourism industry has experienced a remarkable shift in consumer booking behavior. The rise of online platforms has redefined travel planning, enabling travelers to compare prices, read reviews, and make informed decisions with unprecedented ease (Huang & Ha, 2020). However, in the context of outbound tourism, where travelers seek international experiences, cultural diversity plays a pivotal role in shaping decision-making. Intercultural competence, defined as the ability to navigate cultural differences effectively, has increasingly gained recognition as a critical factor influencing consumer behavior in cross-cultural settings (Hammer, 2023). This is particularly relevant for Gen Z travelers, who are often exposed to diverse cultural dynamics during the booking process and their travel experiences.

* Corresponding author

The Technology Acceptance Model (TAM), developed by Davis (1989), has been extensively applied to understand consumer behavior in adopting technology. TAM identifies two primary constructs—perceived usefulness and perceived ease of use—as key determinants of behavioral intention. However, as tourism becomes more globalized and culturally diverse, integrating the role of intercultural competence into TAM is essential to capture the complex interplay between technology and cultural variables. Intercultural competence not only enhances individuals' ability to engage with diverse online content but also influences their perception of trust and reliability in platforms catering to international travel needs (Chen & Hwang, 2019). Therefore, applying an extended TAM model incorporating intercultural competence provides a novel perspective on how Gen Z customers in Vietnam approach online outbound tourism bookings (Salem et al., 2024).

Despite the growing body of literature on the adoption of online booking platforms and intercultural competence, limited research exists on the intersection of these areas, particularly within the Vietnamese context. Vietnam's unique cultural and economic characteristics, coupled with the distinct preferences of its Gen Z population, present an opportunity to explore new dimensions of consumer behavior (Giao et al., 2021). This study aims to bridge the gap by examining the influence of TAM constructs and intercultural competence on Gen Z customers' online outbound tourism booking intention in Vietnam.

Although the TAM model has been widely utilized in tourism and technology adoption studies, there are two critical research gaps in the existing body of literature. First, while TAM provides valuable insights into the factors influencing technology adoption, it often neglects the role of cultural variables in shaping consumer behavior. Research on intercultural competence has highlighted its significance in cross-cultural interactions, particularly in the context of tourism, where cultural diversity is a defining characteristic (Hammer, 2023). However, few studies have attempted to integrate intercultural competence into TAM to examine its influence on online booking intentions. For instance, studies such as those by Ali et al. (2022); Erjavec & Manfreda (2022) have explored technology adoption in tourism but have overlooked the interplay between cultural competence and technology use. This gap underscores the need for a more comprehensive framework that incorporates intercultural dimensions to understand consumer behavior in outbound tourism (Muñoz et al., 2025).

Second, there is a dearth of research focusing specifically on Gen Z customers in Vietnam. Most studies on online booking intention have centered on broader demographic groups or have been conducted in Western contexts, limiting their applicability to Vietnamese Gen Z consumers. Gen Z travelers in Vietnam exhibit unique behaviors, such as their reliance on social media for travel inspiration, preference for visually appealing platforms, and sensitivity to cultural nuances in international travel (Kdv et al., 2024; Park et al., 2017). Existing studies, such as those by Dragolea et al. (2023); San Martín & Herrero (2012), have primarily focused on technological factors without delving into the demographic-specific tendencies of Gen Z in Vietnam. Consequently, there is a pressing need to explore the intersection of Gen Z consumer behavior, online booking platforms, and intercultural competence in the Vietnamese context.

Furthermore, while studies like Fitzgerald et al. (2018) have demonstrated the importance of self-awareness and reflective thinking in developing intercultural competence, their findings are often limited to educational interventions rather than real-world consumer behaviors. In Vietnam, where outbound tourism is rapidly growing, understanding how Gen Z customers apply intercultural competence during the online booking process is critical. This research addresses these gaps by extending the TAM model to include intercultural competence as a moderating variable and focusing on the unique characteristics of Vietnamese Gen Z travelers. This study aimed to investigate the factors influencing Gen Z customers' online outbound tourism booking intentions in Vietnam through the lens of the Technology Acceptance Model (TAM) and the role of intercultural competence. By integrating intercultural competence into the TAM framework, this study offered a more comprehensive understanding of the dynamics influencing online booking behaviors in a culturally diverse and technology-driven environment. This paper is structured as follows: Section 2 reviews the relevant literature on TAM, intercultural competence, and Gen Z consumer behavior. Section 3 describes the research methodology, including data collection and analysis techniques. Section 4 presents the findings, followed by a discussion in Section 5. Finally, Section 6 concludes the study with implications, limitations, and recommendations for future research.

LITERATURE REVIEW

Gen Z and intercultural competences

Generation Z (Gen Z), born between 1997 and 2012, represents the first cohort of true digital natives, growing up immersed in technology and social media (Djafarova & Bowes, 2021). This demographic is characterized by a strong preference for online platforms to manage various aspects of their daily lives, including travel arrangements. Their reliance on digital tools for travel inspiration, planning, and booking makes them an essential focus for tourism research (Yamagishi et al., 2023). Gen Z consumers are known for prioritizing seamless and personalized digital experiences, favoring platforms that offer ease of use, convenience, and visually appealing interfaces.

Vietnam, with its high penetration of mobile internet and growing outbound tourism market, provides an emerging context for exploring the behaviors of Gen Z travelers. As outbound tourism involves cross-border travel, Gen Z consumers in Vietnam must navigate diverse cultural landscapes, both during the booking process and their international experiences (Ho et al., 2024). This intersection of technology-driven behaviors and cross-cultural interactions underscores the importance of examining how intercultural competence influences their online booking behaviors.

Intercultural competence is defined as the ability to effectively navigate and adapt to cultural differences, encompassing knowledge, skills, and attitudes that enable individuals to engage constructively in culturally diverse contexts (Hammer, 2023). In the tourism domain, intercultural competence is increasingly recognized as a critical factor influencing decision-making, as consumers are exposed to diverse cultural elements during international travel planning. For Gen Z, who are often motivated by the desire for unique and authentic cultural experiences, the ability to interpret and engage with various cultural cues plays a significant role in shaping their travel preferences and behaviors (Fitzgerald et al., 2018). Research suggests that intercultural competence enhances booking intention in online platforms that cater to diverse audiences, as it enables consumers to evaluate information and services from a culturally informed perspective. This is particularly relevant for outbound tourism booking, where understanding cultural nuances can influence perceptions of platform reliability and the overall user experience. Despite its importance, the role of intercultural competence in shaping online booking behaviors remains underexplored, particularly for Gen Z customers in Vietnam's outbound tourism market.

The Technology Acceptance Model with intercultural competence as an external variable

The Technology Acceptance Model (TAM), developed by Davis (1989), is one of the most widely used frameworks for understanding technology adoption. TAM posits that two key constructs - Perceived Usefulness and Perceived Ease of Use - directly influence an individual's attitude toward using a system, which in turn impacts behavioral intention and actual usage (Tran & Khoa, 2025). TAM has been extensively applied in tourism and e-commerce research to examine consumer adoption of online booking platforms. For instance, studies by Chishty & Sayari (2024); Khoa et al. (2022) have demonstrated the effectiveness of TAM in explaining online shopping and booking behaviors.

However, these studies often overlook the role of cultural variables in shaping consumer perceptions and attitudes, particularly in cross-cultural contexts. To address this limitation, recent research advocates for the inclusion of external variables, such as intercultural competence, to enhance TAM's explanatory power in culturally diverse settings (Zhang & Zhou, 2023). Intercultural competence can influence PU and PEOU by shaping how users interpret and engage with online platforms that incorporate multicultural content and features. For example, consumers with higher intercultural competence are more likely to perceive a platform as useful and user-friendly if it aligns with their cultural expectations and facilitates cross-cultural interactions (Fitzgerald et al., 2018).

In the context of outbound tourism, intercultural competence also directly impacts booking intentions by fostering attitude and reducing uncertainty associated with international travel planning. By integrating intercultural competence into the TAM framework, this study aims to provide a more nuanced understanding of Gen Z customers' online booking intention, particularly in Vietnam's outbound tourism market. The research model was proposed as Figure 1.

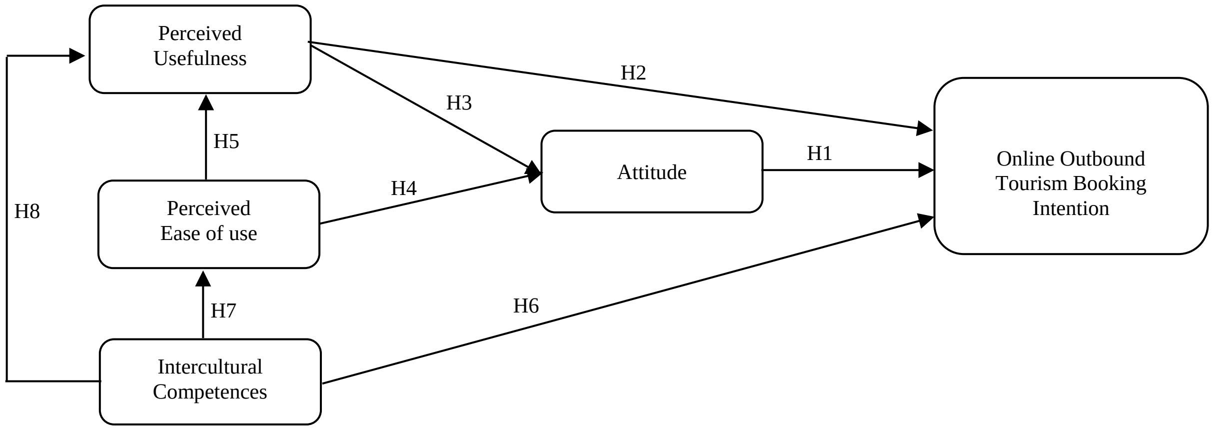

Figure 1. Theoretical model

Research hypotheses development

Attitude, defined as an individual's positive or negative evaluation of using a system, is a critical determinant of behavioral intention (Hung & Khoa, 2022; Ajzen, 1991). For Gen Z customers, a favorable attitude toward online booking platforms is shaped by their perception of the platform's usefulness and ease of use, as well as their overall satisfaction with the digital experience (Yadav & Seranmadevi, 2024; Clubbs et al., 2021). Studies have shown that a positive attitude toward technology significantly enhances users' willingness to adopt it, particularly in environments where convenience and efficiency are prioritized (Nowacki et al., 2023). In Vietnam, where Gen Z travelers are highly engaged with digital platforms, their attitude toward online outbound tourism booking is expected to play a pivotal role in shaping their booking intentions. Hence, this study proposed the hypothesis:

H1: Attitude has a positive impact on the Gen Z customer's Online Outbound Tourism Booking Intention in Vietnam.

Perceived Usefulness reflects the extent to which users believe that using a system will enhance their performance or achieve desired outcomes (Venkatesh & Davis, 2000). In the context of online outbound tourism booking intention, perceived usefulness encompasses factors such as convenience, time savings, and access to comprehensive information (Tran & Khoa, 2025; Madi et al., 2024). For Gen Z travelers in Vietnam, online platforms that provide user-friendly interfaces and reliable information are perceived as highly useful, thereby increasing their intention to book. Existing research highlights the strong relationship between perceived usefulness and behavioral intention, particularly in technology-driven industries like tourism (Wong et al., 2023). Perceived usefulness not only influences behavioral intention directly but also shapes users' attitudes toward technology (Wang et al., 2015). When Gen Z customers perceive an online platform as useful, they are more likely to develop a positive attitude toward using it. This relationship has been validated in multiple studies, which indicate that perceived usefulness significantly enhances users' overall satisfaction and willingness to engage with technology (Khoa, 2024). In the context of outbound tourism booking, platforms that meet Gen Z's expectations for efficiency and personalization are likely to foster favorable attitudes. Consequently, this study posited the hypotheses:

H2: Perceived Usefulness has a positive impact on the Gen Z customer's Online Outbound Tourism Booking Intention in Vietnam.

H3: Perceived Usefulness has a positive impact on the Gen Z customer's Attitude toward Online Outbound Tourism Booking.

Perceived Ease of Use refers to the degree to which a user perceives a system as easy to navigate and interact with (Anifa & Sanaji, 2022). For Gen Z travelers, who value seamless and intuitive digital experiences, Perceived Ease of Use is a critical determinant of their attitude toward online booking platforms. Research indicates that systems with high Perceived Ease of Use are more likely to elicit positive attitudes, as they reduce the cognitive effort required for interaction (Arifah & Juniarti, 2021). Perceived ease of use also influences perceived usefulness by shaping users' perceptions of the system's efficiency and reliability. When a platform is easy to use, users are more likely to perceive it as useful, as it facilitates the achievement of their goals with minimal effort (Kim et al., 2021). For Gen Z customers in Vietnam, platforms that combine ease of use with functionality are likely to be perceived as highly beneficial, enhancing their overall booking experience (Khoa & Huynh, 2024; Hur et al., 2017). Therefore, this investigation proposed the hypotheses:

H4: Perceived Ease of Use has a positive impact on the Gen Z customer's Attitude toward Online Outbound Tourism Booking.

H5: Perceived Ease of Use has a positive impact on the Perceived Usefulness of Online Outbound Tourism Booking systems.

Intercultural competence directly influences booking intentions by fostering trust and reducing uncertainty in cross-cultural interactions (Zhang & Zhou, 2023). For Vietnamese Gen Z travelers, who engage with diverse cultural content during the booking process, higher intercultural competence enhances their confidence in using online platforms for outbound tourism. Intercultural competence also contributes to perceived ease of use by enabling users to navigate culturally diverse content more effectively. Consumers with higher intercultural competence are better equipped to interpret and engage with platform features tailored to international audiences, thereby enhancing their perception of ease of use (Fitzgerald et al., 2018). Finally, intercultural competence influences perceived usefulness by enabling users to appreciate the value of culturally adaptive features in online booking platforms. For Gen Z travelers, platforms that cater to diverse cultural preferences are perceived as more useful, as they align with their expectations for personalized and inclusive digital experiences (Chen & Hwang, 2019). Consequently, this study posited the hypotheses:

H6: Intercultural Competences have a positive impact on the Gen Z customer's Online Outbound Tourism Booking Intention in Vietnam.

H7: Intercultural Competences have a positive impact on the Perceived Ease of Use of Online Outbound Tourism Booking systems.

H8: Intercultural Competences have a positive impact on the Perceived Usefulness of Online Outbound Tourism Booking systems.

METHODOLOGY

Measurement scale

The constructs in this study were measured using a structured questionnaire based on established scales, adapted to the context of Gen Z customers' online outbound tourism booking intentions in Vietnam. The questionnaire was designed to assess five main constructs: Perceived Usefulness (USE), Perceived Ease of Use (EOU), Attitude (ATI), Intercultural Competences (ICO), and Online Outbound Tourism Booking Intention (OTB). Each item was measured on a five-point Likert scale ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree"), ensuring that the scales captured nuanced perceptions and behaviors of the respondents. The development of the measurement scales was guided by prior research and validated instruments in technology acceptance, tourism behavior, and intercultural competence. USE, EOU, was measured with three items adapted from previous studies (Davis, 1989). ATI was measured with three items derived from prior research on technology acceptance and consumer behavior (Kirkpatrick et al., 2024). OTB was measured with three items adapted from tourism and technology adoption literature (San Martín & Herrero, 2012). Intercultural Competences represent the ability to effectively navigate and adapt to cultural differences, particularly in cross-cultural settings such as international tourism (Hammer, 2023; Fitzgerald et al., 2018). This construct was measured with four items adapted from the Intercultural Development Inventory (IDI) and research on intercultural competence in tourism. Each scale was pre-tested for clarity with a small group of Gen Z respondents to ensure that the items were contextually relevant and understandable.

Sample and data collection

The target population for this study was Gen Z customers in Vietnam, defined as individuals born between 1997 and 2012. This demographic was chosen for its digital fluency, reliance on online platforms for decision-making, and increasing participation in outbound tourism. Data were collected using an online survey administered through social media platforms and online travel communities popular among young Vietnamese travelers, such as Facebook, Instagram, and Zalo. A purposive sampling method was employed to ensure that the respondents met the following criteria:

1. They were Gen Z consumers residing in Vietnam.
2. They had prior experience using online platforms for tourism-related activities.
3. They had either booked or intended to book outbound tourism services in the near future.

The survey was conducted over a six-months period (from June 2024 to December 2024), and a total of 550 responses were received. After removing incomplete and invalid responses, a final sample of 312 valid responses was retained for analysis, achieving a response rate of approximately 56.72%. The sample size exceeded the recommended threshold for Partial Least Squares structural equation modeling (PLS-SEM) analysis, ensuring adequate statistical power (Hair Jr et al., 2016). To enhance data reliability, the survey incorporated attention-check questions to identify and exclude respondents who provided inconsistent or random answers. Ethical considerations were observed, including obtaining informed consent and ensuring respondent anonymity. The data were securely stored and analyzed using SPSS and SmartPLS software.

The final sample of 312 respondents consisted entirely of Gen Z individuals in Vietnam. Figure 2 provides a demographic breakdown of the sample, highlighting key characteristics such as gender, age, area, and education level. The majority of the participants were female (57.69%), with males constituting 42.31% of the sample. Geographic distribution was balanced, encompassing participants from urban areas such as Hanoi (32.05%), Ho Chi Minh City (48.72%), and Da Nang (19.23%), reflecting the urban-centric nature of online booking adoption in Vietnam.

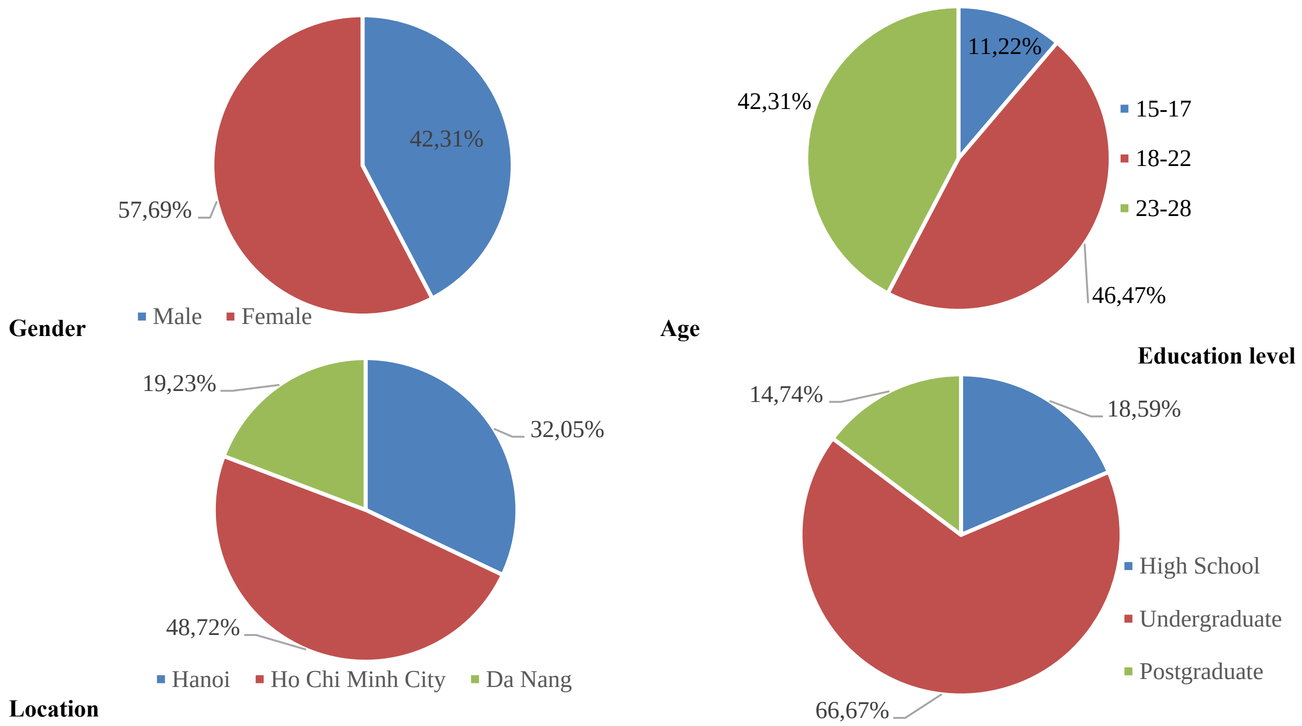

Figure 2. Demographic profile of respondents

RESULT

Measurement model assessment

The assessment of the measurement model involved examining the reliability, convergent validity, and discriminant validity of the constructs used in this study. The analysis was conducted using SmartPLS software, with results meeting the thresholds for reliability and validity based on prior methodological recommendations (Hair Jr et al., 2016). To ensure internal consistency, Cronbach's Alpha (α) and Composite Reliability (CR) values were assessed in Table 1.

Table 1. Reliability and convergent validity

Construct	α	CR	AVE	OL (Min - Max)
Perceived Usefulness (USE)	0.88	0.93	0.76	0.81 - 0.89
Perceived Ease of Use (EOU)	0.84	0.9	0.74	0.80 - 0.88
Attitude (ATI)	0.87	0.91	0.78	0.84 - 0.91
Intercultural Competence (ICO)	0.92	0.94	0.79	0.83 - 0.92
Online Outbound Tourism Booking Intention (OTB)	0.89	0.94	0.8	0.85 - 0.92

Table 2. Fornell-Larcker Criterion

Construct	USE	EOU	ATI	ICO	OTB
Perceived Usefulness (USE)	**0.87**				
Perceived Ease of Use (EOU)	0.61	**0.86**			
Attitude (ATI)	0.58	0.55	**0.88**		
Intercultural Competence (ICO)	0.52	0.49	0.61	**0.89**	
Online Outbound Tourism Booking Intention (OTB)	0.67	0.62	0.7	0.66	**0.89**

Both metrics surpassed the recommended threshold of 0.7, indicating adequate reliability. Convergent validity was examined using the Average Variance Extracted (AVE), with all constructs achieving AVE values above the 0.5 threshold, confirming that the items adequately explained their respective constructs (Fornell & Larcker, 1981). Outer loadings (OL) for all items exceeded 0.7, further evidencing convergent validity. Discriminant validity was assessed using the Fornell-Larcker criterion. The Fornell-Larcker criterion in Table 2 indicated that the square roots of AVE for each construct were higher than their correlations with other constructs.

Structural model assessment

The structural model was assessed to evaluate the relationships between constructs and test the hypotheses. The analysis included examining the R^2, f^2, Q^2, path coefficients, variance inflation factors (VIFs) for multicollinearity, and the significance of the structural paths.

The R^2 values in Table 3 indicated substantial explanatory power for the model, with Online Outbound Tourism Booking Intention achieving an R^2 of 0.62, Attitude achieving an R^2 of 0.54, Perceived Usefulness achieving an R^2 of 0.49, and Perceived Ease of Use achieving an R^2 of 0.26. Predictive relevance (Q^2) in Table 3 was assessed using the blindfolding procedure, with all Q^2 values exceeding zero, confirming the model's predictive relevance.

Table 3. R^2 and Q^2 values

Construct	R^2	Q^2
Perceived Usefulness (USE)	0.49	0.31
Perceiveed Ease of Use (EOU)	0.26	0.15
Attitude (ATI)	0.54	0.36
Online Outbound Tourism Booking Intention (OTB)	0.62	0.38

Variance inflation factors (VIFs) were calculated to assess multicollinearity. All VIF values in Table 4 were the recommended threshold of 5.0, indicating no multicollinearity issues. Path coefficients (β) and their significance levels were evaluated using a bootstrapping procedure with 5000 subsamples. All hypothesized paths were significant, supporting the acceptance of all hypotheses. Effect sizes (f^2) were also calculated, with values above 0.02 indicating small effects, 0.15 medium effects, and 0.35 large effects (Cohen, 2013).

Table 4. Path coefficients and effect sizes (f^2)

Hypotheses	β	t-value	p-value	f^2	VIF	Result
H1: ATI → OTB	0.41	5.87	<0.001	0.21	1.92	Accepted
H2: USE → OTB	0.32	4.92	<0.001	0.18	1.67	Accepted
H3: USE → ATI	0.38	6.21	<0.001	0.20	1.72	Accepted
H4: EOU → ATI	0.29	4.45	<0.001	0.14	1.62	Accepted
H5: EOU → USE	0.36	5.78	<0.001	0.19	1.68	Accepted
H6: ICO → OTB	0.27	3.89	<0.001	0.12	1.89	Accepted
H7: ICO → EOU	0.31	4.78	<0.001	0.17	1.85	Accepted
H8: ICO → USE	0.33	4.84	<0.001	0.18	1.78	Accepted

DISCUSSION

This study investigated the factors influencing Gen Z customers' online outbound tourism booking intentions in Vietnam, using an extended Technology Acceptance Model framework that incorporated intercultural competence as an external variable. The research findings provide significant insights that align with and extend existing literature, offering a nuanced understanding of Gen Z consumer behavior in tourism technology adoption.

The results confirmed that attitude has a significant positive impact on online outbound tourism booking intention ($\beta = 0.41$, $p < 0.001$). This finding supports prior studies emphasizing the influence of attitude on behavioral intention (Nowacki et al., 2023; Venkatesh & Davis, 2000; Davis, 1989). Specifically, for Gen Z travelers in Vietnam, attitude is shaped by their positive evaluation of online booking platforms, aligning with Park et al. (2017), who highlighted that favorable attitudes significantly enhance technology adoption in tourism. The study further corroborates the argument made by Zhao et al. (2015) that a positive attitude is driven by seamless digital experiences and contributes directly to behavioral intention.

Perceived Usefulness demonstrated a strong positive effect on booking intention ($\beta = 0.32$, $p < 0.001$), consistent with TAM's foundational propositions (Davis, 1989). This outcome aligns with Erjavec and Manfreda (2022), who observed that usefulness reflects the functional benefits of online systems, such as convenience and efficiency. In the Vietnamese context, Gen Z customers perceive online platforms as indispensable tools for comparing travel options, accessing real-time information, and ensuring efficient trip planning. Additionally, this result confirms the findings of Chen & Hwang (2019), who argued that perceived usefulness is a key motivator in technology adoption across culturally diverse markets.

The study found that Perceived Ease of Use significantly influenced attitude ($\beta = 0.29$, $p < 0.001$). This outcome aligns with Madi et al. (2024), who emphasized that intuitive and user-friendly interfaces are critical for fostering positive consumer attitudes. Gen Z's demand for seamless navigation and minimal cognitive effort while using online platforms mirrors findings by Park et al. (2017), particularly in the context of visually appealing and easy-to-use systems. This reinforces the importance of tailoring platform designs to Gen Z's expectations in Vietnam's burgeoning outbound tourism market.

The inclusion of intercultural competence as an external variable enriched the TAM framework, providing novel insights into Gen Z's cross-cultural interactions during the booking process. Intercultural competence significantly influenced booking intention ($\beta = 0.27$, $p < 0.001$), perceived ease of use ($\beta = 0.31$, $p < 0.001$), and perceived usefulness ($\beta = 0.33$, $p < 0.001$). These findings align with Hammer (2023), who emphasized the importance of intercultural competence in navigating culturally diverse contexts. The study validated assertion of Fitzgerald et al. (2018) that intercultural competence enhances trust in online platforms catering to international audiences. For Vietnamese Gen Z travelers, intercultural competence fosters confidence in interpreting and engaging with culturally diverse content, thus reducing uncertainty and enhancing overall platform reliability (Chen & Hwang, 2019). The integration of intercultural competence into the TAM framework addresses a critical research gap identified in the literature.

While Salem et al. (2024) explored TAM in tourism and technology adoption, they neglected cultural variables. By incorporating intercultural competence, this study advances the understanding of how cultural adaptability interacts with technological constructs like Perceived Usefulness and Perceived Ease of Use. The findings align with Song and Sahid (2025), who argued that intercultural competence is vital for interpreting and engaging with multicultural content, especially in globalized contexts like outbound tourism. Unlike prior studies that primarily focused on Western contexts, this research highlights the unique characteristics of Vietnamese Gen Z customers, such as their reliance on social media for travel inspiration and their sensitivity to cultural nuances. The findings also align with Muñoz et al. (2025), who emphasized Gen Z's preference for visually appealing platforms tailored to their digital fluency. Importantly, this study extends the work of Fitzgerald et al. (2018) by demonstrating that intercultural competence not only enhances cross-cultural interactions but also influences technology adoption in tourism.

CONCLUSION

Theoretical contributions

By incorporating intercultural competence as an external variable, this research provides a more comprehensive framework for understanding technology adoption in cross-cultural contexts. Traditional Technology Acceptance Model studies have largely focused on the constructs of perceived usefulness, perceived ease of use, and attitude as predictors of behavioral intention, often overlooking the cultural dynamics that influence decision-making in digital environments. Intercultural competence involves the ability to adapt and navigate effectively in culturally diverse interactions, which is particularly relevant in the context of online tourism booking platforms that cater to international and multicultural audiences. By integrating intercultural competence into TAM, this study addresses the limitations of traditional models that fail to account for the role of cultural adaptability in technology adoption decisions. The study significantly contributes to the growing body of knowledge on Gen Z, particularly in emerging markets like Vietnam. Gen Z customers, characterized by their digital fluency and global outlook, are not only adept at adopting technology but also exhibit a heightened sensitivity to cultural representation and diversity in online platforms. This research highlights the interplay between digital fluency, cultural adaptability, and technology adoption, offering a nuanced understanding of how these factors shape the behaviors of this influential demographic. Gen Z's ability to engage with culturally diverse content on online platforms further solidifies the importance of intercultural competence as a critical determinant of their booking intentions.

The findings of this study reinforce the relevance of TAM constructs in predicting online booking intentions, as demonstrated by foundational research by Davis (1989) and subsequent validations by Chen & Hwang (2019). Perceived usefulness remains a core determinant of behavioral intention, reflecting the functional benefits and efficiency offered by online booking platforms. Similarly, perceived ease of use significantly influences attitude by reducing cognitive effort and enhancing user experience. The inclusion of intercultural competence bridges the gap between TAM and cultural variables, demonstrating their combined explanatory power in predicting booking intentions.

By highlighting the interconnected roles of these constructs, this research provides a more holistic view of technology adoption in contexts where cultural diversity plays a central role. Unlike most studies conducted in Western settings, this research contextualizes TAM within Vietnam's unique cultural and economic landscape. Vietnam's growing digital economy, coupled with an increasing interest in outbound tourism, presents a distinctive environment for examining the applicability of TAM. Vietnamese Gen Z customers, as digital natives, are not only familiar with online technologies but are also influenced by local socio-cultural factors that differentiate their behavior from those in Western contexts. This study underscores the importance of tailoring global frameworks like TAM to specific cultural and regional settings, providing insights that are both locally relevant and globally applicable. By situating the research within Vietnam, this study advances the understanding of how TAM constructs and intercultural competence interact in an emerging market, offering implications for both academia and industry stakeholders.

Managerial Implications

Tourism platforms targeting Vietnamese Gen Z customers should prioritize user-friendly interfaces, personalized recommendations, and features that reflect cultural diversity. Technologies such as multilingual support and culturally adaptive content can enhance ICO and overall booking experiences. Marketers should leverage social media and influencer collaborations to capture Gen Z's attention. Highlighting intercultural features and promoting trustworthiness can resonate with this demographic's preferences. Tourism companies should invest in training programs to enhance intercultural competence among employees, ensuring culturally sensitive customer interactions and improved service delivery. Policymakers can promote digital transformation in the tourism sector by supporting initiatives that integrate cultural diversity into online platforms. This aligns with Vietnam's broader goals of economic growth and internationalization.

Limitation and further research

Despite its contributions, this study has several limitations. The study focused exclusively on Gen Z customers in Vietnam, which may limit the generalizability of the findings to other demographics or regions. The cross-sectional nature of the research limits the ability to capture changes in consumer behavior over time. A longitudinal approach could provide deeper insights. The reliance on self-reported data may introduce social desirability bias, potentially affecting the accuracy of the results.

Cross-cultural comparisons or age group sampling can solve these constraints in future investigations.

This study only examined Gen Z customers in Vietnam, but include older generations or consumers from different cultures could improve our understanding of online booking behaviour. Researchers can evaluate how cultural values, technology infrastructure, and societal norms affect online tourism booking platform adoption through cross-cultural comparisons. This broader approach may uncover considerable differences in perceived usefulness, ease of use, and intercultural competency, revealing the TAM framework's universal and context-specific features.

Moreover, longitudinal research would be useful in analyzing Gen Z's behavior over time, especially as technology advances and new tourism features or platforms emerge. A longitudinal approach could reveal changes in preferences, attitudes, and booking patterns, revealing technology adoption trends. Further research could incorporate external elements like perceived risk, trust, and social influence to the TAM framework.

For instance, perceived risk may influence online booking behavior, especially for overseas travel. Social influence, including peer recommendations and online evaluations, may also reveal how Gen Z makes decisions in a social and digital ecology. Adding these variables to the model might improve its explanation and application.

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

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgments: We thank respondents, editors, and reviewers who contributed to this research.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211. https://doi.org/10.1016/0749-5978(91)90020-t

Ali, M. B., Tuhin, R., Alim, M. A., Rokonuzzaman, M., Rahman, S. M., & Nuruzzaman, M. (2022). Acceptance and use of ICT in tourism: the modified UTAUT model. *Journal of Tourism Futures, 10*(2), 334-349. https://doi.org/10.1108/jtf-06-2021-0137

Anifa, N., & Sanaji, S. (2022). Augmented Reality Users: The Effect of Perceived Ease of Use, Perceived Usefulness, and Customer Experience on Repurchase Intention. *Journal of Business and Management Review, 3*(3), 252-274. https://doi.org/10.47153/jbmr33.3462022

Arifah, I. D. C., & Juniarti, R. P. (2021). *Interface Aesthetic, Perceived Value, Perceived Ease of Use, and Perceived Usefulness on Purchase Intention of Smartwatch Consumers*. Paper presented at the International Conference on Business and Engineering Management (ICONBEM 2021).https://doi.org/10.2991/aebmr.k.210522.005.

Bakos, J. Y., & Treacy, M. E. (1986). Information Technology and Corporate Strategy: A Research Perspective. *MIS Quarterly, 10*(2), 107-119. https://doi.org/10.2307/249029

Chen, P. Y., & Hwang, G. J. (2019). An empirical examination of the effect of self-regulation and the Unified Theory of Acceptance and Use of Technology (UTAUT) factors on the online learning behavioural intention of college students. *Asia Pacific Journal of Education, 39*(1), 79-95. https://doi.org/https://doi.org/10.1080/02188791.2019.1575184

Chishty, S. K., & Sayari, S. (2024). An empirical assessment of online shopping behavior among Saudi college students: applying SEM. *Cogent Business & Management, 11*(1), 2377374. https://doi.org/10.1080/23311975.2024.2377374

Clubbs, B. H., Gray, N., & Madlock, P. (2021). Using the theory of planned behavior and the technology acceptance model to analyze a university employee fitness tracker program with financial incentive. *Journal of Communication in Healthcare, 14*(2), 149-162. https://doi.org/10.1080/17538068.2020.1864614

Cohen, J. (2013). *Statistical Power Analysis for the Behavioral Sciences*. Hoboken: Taylor and Francis. doi: 10.4324/9780203771587

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly, 13*(3), 319-340. https://doi.org/10.2307/249008

Djafarova, E., & Bowes, T. (2021). 'Instagram made Me buy it': Generation Z impulse purchases in fashion industry. *Journal of Retailing and Consumer Services, 59*, 102345. https://doi.org/10.1016/j.jretconser.2020.102345

Dragolea, L. L., Butnaru, G. I., Kot, S., Zamfir, C. G., Nuță, A. C., Nuţă, F. M., & Ștefănică, M. (2023). Determining factors in shaping the sustainable behavior of the generation Z consumer. *Frontiers in Environmental Science, 11*, 1096183. https://doi.org/ 10.3389/fenvs.2023.1096183

Erjavec, J., & Manfreda, A. (2022). Online shopping adoption during COVID-19 and social isolation: Extending the UTAUT model with herd behavior. *Journal of Retailing and Consumer Services, 65*, 102867. https://doi.org/10.1016/j.jretconser.2021.102867

Fitzgerald, E. A., Marzalik, P. R., & Kue, J. (2018). Assessing Intercultural Development Pre- and Post Education Abroad. *J Nurs Educ, 57*(12), 747-750. https://doi.org/10.3928/01484834-20181119-08

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research, 18*(1), 39-50. https://doi.org/10.1177/002224378101800104

Giao, H. N. K., Vuong, B. N., Phuong, N. N. D., & Dat, N. T. (2021). A Model of Factors Affecting Domestic Tourist Satisfaction on Eco-Tourism Service Quality in the Mekong Delta, Vietnam. *GeoJournal of Tourism and Geosites, 36*(2spl), 663-671. https://doi.org/10.30892/gtg.362spl14-696

Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Washington DC: Sage publications.

Hammer, M. R. (2023). The Intercultural Development Inventory. In *Student Learning Abroad,* 115-136, Routledge.

Ho, P. T., Ho, M. T., & Huang, M. L. (2024). Understanding the impact of tourist behavior change on travel agencies in developing countries: Strategies for enhancing the tourist experience. *Acta Psychol (Amst), 249*, 104463. https://doi.org/10.1016/j.actpsy.2024.104463

Huang, R., & Ha, S. (2020). The effects of warmth-oriented and competence-oriented service recovery messages on observers on online platforms. *Journal of Business Research, 121*, 616-627. https://doi.org/10.1016/j.jbusres.2020.04.034

Hung, N. P., & Khoa, B. T. (2022). Examining the Structural Relationships of Electronic Word of Mouth, Attitude toward Destination, Travel Intention, Tourist Satisfaction and Loyalty: A Meta-Analysis. *GeoJournal of Tourism and Geosites, 45*(4 supplement), 1650-1660. https://doi.org/10.30892/gtg.454spl15-986

Hur, K., Kim, T. T., Karatepe, O. M., & Lee, G. (2017). An exploration of the factors influencing social media continuance usage and information sharing intentions among Korean travellers. *Tourism Management, 63*, 170-178. https://doi.org/10.1016/j.tourman.2017.06.013

Kdv, P., Shyamsunder, C. S., & Soni, H. (2024). Relationship Between Green Finance Availability and Purchase Intentions in Generation Z and Millennials: Moderating Role of Consciousness. *Qubahan Academic Journal, 4*(3), 412-425. https://doi.org/10.48161/qaj.v4n3a987

Khoa, B. T. (2024). *Improving the Tour Booking Intention in Tourism Through Digitalizing Cultural Intangible Heritage: Evidence from Vietnam.* Paper presented at the 2024 2nd International Conference on Sustaining Heritage: Embracing Technological Advancements (ICSH).https://doi.org/10.1109/ICSH62408.2024.10779947.

Khoa, B. T., Ha, N. M., & Ngoc, B. H. (2022). *The Accommodation Services Booking Intention Through the Mobile Applications of Generation Y: An Empirical Evidence Based on TAM2 Model.* Paper presented at the International Econometric Conference of Vietnam.https://doi.org/10.1007/978-3-030-77094-5_43.

Khoa, B. T., & Huynh, T. T. (2024). *How to Improve the Destination Choice in Heritage Tourism Through Tourism Digitalization: Case of Vietnam.* Paper presented at the 2024 2nd International Conference on Sustaining Heritage: Embracing Technological Advancements (ICSH).https://doi.org/10.1109/ICSH62408.2024.10779832.

Kim, S. E., Kim, H., & Yang, S. B. (2021). Why not this destination? The effects of travel constraints of independent travelers on destination image formation. *International Journal of Tourism Research, 23*(6), 1073-1085. https://doi.org/10.1002/jtr.2463

Kirkpatrick, R., Kirkpatrick, J., & Derakhshan, A. (2024). An investigation into the motivation and attitudes of Japanese students toward learning English: A case of elementary and junior high school students. *Asian-Pacific Journal of Second and Foreign Language Education, 9*(1), 23. https://doi.org/10.1186/s40862-023-00243-z

Madi, J., Al Khasawneh, M., & Dandis, A. O. (2024). Visiting and revisiting destinations: impact of augmented reality, content quality, perceived ease of use, perceived value and usefulness on E-WOM. *International Journal of Quality & Reliability Management, 41*(6), 1550-1571. https://doi.org/10.1108/ijqrm-10-2023-0314

Muñoz, K. E., Roma, M., & Almiñe-Catacutan, M. (2025). Enhancing tourism students' intercultural skills with design thinking. *Anatolia*, 1-15. https://doi.org/10.1080/13032917.2025.2451902

Nowacki, M., Kowalczyk-Anioł, J., & Chawla, Y. (2023). Gen Z's Attitude towards Green Image Destinations, Green Tourism and Behavioural Intention Regarding Green Holiday Destination Choice: A Study in Poland and India. *Sustainability, 15*(10), 7860. https://doi.org/10.3390/su15107860

Park, K., Ha, J., & Park, J. Y. (2017). An Experimental Investigation on the Determinants of Online Hotel Booking Intention. *Journal of Hospitality Marketing & Management, 26*(6), 627-643. https://doi.org/10.1080/19368623.2017.1284631

Salem Islam, E., El-Said Osman, A., El Gamil, R., Afifi Mohamed, F., & Attallah Nashwa, F. (2024). How Tourism Cultural Events Influence Multicultural Competence, Tourism Destination Image, and Visit Intentions: Evidence From the Pharaohs' Golden Parade. *International Journal of Tourism Research, 26*(5). https://doi.org/10.1002/jtr.2740

San Martín, H., & Herrero, Á. (2012). Influence of the user's psychological factors on the online purchase intention in rural tourism: Integrating innovativeness to the UTAUT framework. *Tourism Management, 33*(2), 341-350. https://doi.org/10.1016/j.tourman.2011.04.003

Song, Z., & Sahid, S. (2025). Exploring factors shaping intercultural competence among China's college students to seize global business opportunities: A systematic literature review. *Social Sciences & Humanities Open, 11*, 101190. https://doi.org/10.1016/j.ssaho.2024.101190

Tran, A. V., & Khoa, B. T. (2025). The Impact of Mobile Augmented Reality on Green Experience and Destination Choice Intention in Green Tourism in Vietnam. *GeoJournal of Tourism and Geosites, 58*(1), 136-145. https://doi.org/10.30892/gtg.58112-1397

van der Heijden, H., Verhagen, T., & Creemers, M. (2017). Understanding online purchase intentions: contributions from technology and trust perspectives. *European Journal of Information Systems, 12*(1), 41-48. https://doi.org/10.1057/palgrave.ejis.3000445

Venkatesh, V., & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science, 46*(2), 186-204. https://doi.org/10.1287/mnsc.46.2.186.11926

Wang, L., Law, R., Guillet, B. D., Hung, K., & Fong, D. K. C. (2015). Impact of hotel website quality on online booking intentions: eTrust as a mediator. *International Journal of Hospitality Management, 47*, 108-115. https://doi.org/10.1016/j.ijhm.2015.03.012

Wong, E. Y., Hui, R. T., & Kong, H. (2023). Perceived usefulness of, engagement with, and effectiveness of virtual reality environments in learning industrial operations: the moderating role of openness to experience. *Virtual Real, 27*(3), 1-17. https://doi.org/10.1007/s10055-023-00793-0

Yadav, G. N. S., & Seranmadevi, R. (2024). The Digital Transformation. In *Digital Technologies, Ethics, and Decentralization in the Digital Era*, 80-98, IGI Global.

Yamagishi, K., Canayong, D., Domingo, M., Maneja, K. N., Montolo, A., & Siton, A. (2023). User-generated content on Gen Z tourist visit intention: a stimulus-organism-response approach. *Journal of Hospitality and Tourism Insights, 7*(4), 1949-1973. https://doi.org/10.1108/jhti-02-2023-0091

Zhang, X., & Zhou, M. (2023). Factors affecting university students' intention to use mobile apps for intercultural competence development: A mixed-method approach. *Education and Information Technologies, 29*(6), 6991-7026. https://doi.org/10.1007/s10639-023-12106-8

Zhao, X., Wang, L., Guo, X., & Law, R. (2015). The influence of online reviews to online hotel booking intentions. *International Journal of Contemporary Hospitality Management, 27*(6), 1343-1364. https://doi.org/10.1108/ijchm-12-2013-0542

Article history: Received: 25.01.2025 Revised: 08.05.2025 Accepted: 02.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1128-1135
DOI 10.30892/gtg.602spl10-1486

METAPHORS IN TOURISM PROMOTION: A CASE STUDY OF A THAI VILLAGE AND THE BEEHIVE CONCEPT

Anikó MAKKOS [1*], Chin-Ling TSAI [2], Janka Sára TÓTH [3]

[1] Széchenyi István University, Department of International Studies and Communication, Apáczai Csere János Faculty of Humanities, Education and Social Sciences, Győr, Hungary; makkos.aniko@sze.hu (A.M.)
[2] National Taipei University, Leisure and Sports Management Department, College of Business, New Taipei City, Taiwan; s410984017@gm.ntpu.edu.tw (C.L.T.)
[3] RD Hotels Kft., Budapest, Hungary; tothjanka.sara06@gmail.com (J.S.T.)

Citation: Makkos, A., Tsai, C.L., & Tóth, J.S. (2025). Metaphors in tourism promotion: A case study of a Thai village and the beehive concept. *Geojournal of Tourism and Geosites*, 60(2spl), 1128–1135. https://doi.org/10.30892/gtg.602spl10-1486

Abstract: Metaphors are effective tools in tourism promotion, simplifying complex local features for tourists to appreciate. Sustainable tourism, by encouraging responsible habits, allows travelers to engage in environmental conservation while immersing themselves in local cultures. In this context, the primary aim of the research was to seek ways of promoting the unique features of Ban Nong Bua, a Thai village, while addressing global sustainability issues. A further aim was to develop educational material that would make sustainability attractive to local young children and familiarize them with local sustainability practices. During an 8-day stay, a multicultural team conducted action research through observations, interviews and interactions with local people with a focus on sustainable livelihood and tourism promotion. The fieldwork was complemented by regular brainstorming sessions, during which the concepts and plans that led to the final research product were developed based on the material collected and personal experience. The result of the research is the beehive metaphor as a conceptual framework that highlights the harmony and sustainable practices of the local community. The further result of the research is the creation of a booklet for both tourists and local children. On one hand, for tourists, the booklet provides an engaging introduction to the seaside village of Ban Nong Bua, enhancing its appeal as a sustainable destination. It is a complex metaphor that represents the way of life of the inhabitants of the settlement on several levels, such as the close relationship with water, the use of local resources, the division of labor, the high degree of social organization, cohesion and connectedness, or dancing as a specific manifestation of communication. Bees can also be seen as a symbol of sustainability. On the other hand, for local children, it serves as an English language educational tool, fostering an appreciation of sustainable practices through an interactive format. Although the short-term impact of the booklet cannot be measured, the research illustrates how tools such as metaphors can achieve multiple goals in sustainable tourism and sustainability education. The research promotes cross-cultural understanding, supports community sustainability and demonstrates the value of metaphor in tourism promotion. Future research could further explore the use of metaphors in tourism marketing and sustainability education.

Keywords: action research, metaphors, sustainable tourism, tourism promotion, sustainability education

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INTRODUCTION

Travel is an integral part of our lives; it not only brings joy and a sense of accomplishment but also broadens our horizons. Nowadays, tourists' interests are shifting towards in-depth experiences (Mihelj, 2010) to gain a better understanding of local lifestyles and to appreciate diverse cultures and values. To effectively promote such rich and varied experiences, metaphors serve as powerful tools in attracting the interest of tourists. McQuarrie & Mick (1996) noted that "[a]dvertisements often make use of metaphors." Similarly, Semino (2008) claims that metaphors in advertising discourse are used "as attention-grabbing devices." Furthermore, metaphors play a crucial role in communication.

As tourist destinations compete to attract visitors, their success depends significantly on their regional competitiveness, shaped by their unique attractiveness characteristics (Cracolici & Nijkamp, 2009). However, as Morgan & Pritchard (2012) point out, the increasing number of accessible tourist destinations has diluted established destination identities, with many relying on similar imagery such as blue seas and golden beaches. To stand out, it is crucial for destinations to project a unique identity (Morgan & Pritchard, 2012). This is where sustainability has emerged as a vital promotional tool, not only enhancing a destination's appeal but also encouraging responsible tourism practices. To explore how metaphors can effectively promote sustainable tourism, this study focuses on the Thai village of Ban Nong Bua, located in the south of Hua Hin with a population of 1,752 people. Ban Nong Bua is a vibrant village where agriculture, fishing, and tourism are the main sectors of the local economy. Farmers use organic fertilizer on their farms to protect the food consumed by the villagers. The ocean, in particular, plays a vital role in this village, supporting the livelihood of 16 fishing families and attracting around 200,000 tourists annually. In response to environmental challenges, the community has initiated sustainability projects, such as beach clean-ups, to keep the cleanliness of the beaches. These efforts highlight the

* Corresponding author

villagers' commitment to maintaining a sustainable lifestyle, not only to protect their environment but also to ensure the continued success of their tourism industry, which is essential to their economic stability. During an eight-day stay in the village, a group of university lecturers, undergraduate students and tourism professionals took part in action resea rch focusing on sustainability. One dedicated research circle collected the unique features of the village and sought to address these issues through the use of metaphors. Specifically, the metaphor of a beehive was found as a concept that encapsulates the harmony, commitment, and cooperation experienced within the community. This metaphor was then used to compile a booklet aimed at helping tourists understand and remember the unique charm of Ban Nong Bua.

The booklet also emphasizes the cultural identity and community spirit of the villagers and highlights their efforts to live sustainably. Beyond tourism promotion, the booklet also serves an educational purpose, particularly for the village's children. Tobing (2018) emphasizes that understanding metaphors is a systematic thinking process, which can be a highly useful exercise in primary education. By illustrating the parallels between a beehive's organization and human society, the booklet aims to teach children about sustainability and environmental stewa rdship, encouraging them to appreciate cultural heritage and contribute meaningfully to their community.

The purpose of this study is to discuss how metaphors can effectively promote tourism while simultaneously serving as an educational tool for sustainability awareness. Specifically, through the development and application of a booklet (a chosen promotion media), the study aims to enhance the understanding and appeal of Ban Nong Bua to potential tourists while supporting sustainability education within the community.

To achieve this goal, this study addresses the following research questions:

1. How can metaphors be applied as a communication tool to enhance tourism promotion and destination branding?
2. What is the role of the beehive metaphor in reinforcing sustainable tourism conceptsamong visitors?
3. How can metaphor-based tourism materials contribute to sustainability education for local communities?

THEORETICAL BACKGROUND

The role of metaphors in tourism

Lakoff & Johnson (1980: 5) argued in their book Metaphor We Live By that “the essence of metaphor is understanding and experiencing one kind of thing in terms of another.” People employ metaphorical language not just to convey metaphorical meaning, but to concretely achieve various social, pragmatic goals (Gibbs, 2023). In the field of tourism, metaphors help to visualize experiences, making them more concrete and appealing to potential tourists. This approach is particularly effective in tourism advertising, where metaphorical language can foster a stronger intention to visit a destination compared to straightforward promotional methods (Yang et al., 2024).

Jaworska (2017) discusses Dann's (1996) view that one of the main reasons for the increased use of this kind of figurative language is its ability to reduce what he calls the effect of strangeness by turning an unfamiliar phenomenon into something familiar and recognizable. Metaphors can evoke emotions and create vivid mental images, which are often automatically activated, enhancing the impact of creative metaphors (Carston, 2018). They also carry immense persuasive potential, often deliberately exploited by marketers to influence people’s thinking and actions (Jaworska, 2017).

Metaphors are frequently employed in the marketing and promotion of tropical tourist destinations. A common example is the use of the word "Paradise" to describe tropical islands. Dewi (2016) explores this phenomenon in her study on tourism promotion materials from Sumedang, Indonesia. Her research identifies various types of metaphors used in this context, including phrases like "foot of the mountain" and "hot springs," which are categorized as dead metaphors according to Newmark’s (1988) classification. These metaphors, which utilize human body parts, enhance promotional messages by making the destination's physical features more relatable and attractive to tourists. Additionally, Dewi highlights the use of standard metaphors such as "clusters of large rocks" to describe the mountain’s landscape, further drawing tourists to the area. Likewise, Wijanarto (2020) investigates the use of metaphorical expressions in an article about Raja Ampat on the Indonesia.travel website. The study identifies 13 metaphorical expressions used to describe Raja Ampat, creating vivid imagery and emotional connections for potential travelers. For example, “living library” is used to describe the diverse marine life and coral reefs in Raja Ampat as a library, indicating that there is a wealth of knowledge and beauty to explore beneath the water. And “meeting list” refers to the variety of fish species, which suggests that encountering these marine creatures is akin to checking off items on a list, making the experience of visiting Raja Ampat feel organized and fulfilling. By employing these metaphors, the article effectively brings the destination closer to travelers, especially those living in urban environments, making it more relatable and enticing.

Similarly, recent research on rural tourism marketing in Indonesia suggests that the combination of natural and cultural attractions plays a crucial role in shaping tourists’ perceptions of authenticity (Firstianto et al., 2024). The study highlights that nature-based tourism remains a dominant attraction, while cultural experiences further enhance the appeal of rural destinations. This aligns with the idea that metaphors in tourism promotion often capitalize on authenticity and a deep connection with nature, reinforcing the emotional and experiential aspects of rural tourism. According to the study by Muhammad & Rashid (2014: 336), "[t]he animal kingdom is a source domain that can provide rich metaphorical expressions, possibly due to the close relationship between humans and animals since ancient times”. For example, lions and bulls are commonly used to represent courage and strength (Rodriguez, 2009). In the metaphor used in this research the source domain is the beehive, and the target domain is the village, so the metaphor is: VILLAGE IS BEEHIVE.

Sustainability tourism and sustainable tourism marketing

Sustainable tourism is defined as tourism that takes full account of its current and future economic, social, and environmental impacts, addressing the needs of visitors, the industry, the environment, and host communities (Burgoyne & Mearns, 2019). The evolution of sustainable tourism can be traced back to the late 1980s, with increasing recognition of its importance in tourism policy and practice (Guo et al., 2019). This approach aims to balance the economic benefits of tourism with the preservation of cultural and natural resources, ensuring that tourism development is possible in the long term (Štreimikienė et al., 2020). Recent studies emphasize that sustainable tourism development must consider various dimensions, including environmental conservation, social responsibility, and economic viability (Kumari & Thakur, 2023).

Sustainable tourism marketing plays a vital role in promoting these practices by raising awareness among consumers and encouraging responsible travel behaviors. Sustainable marketing strategies focus on building relationships with loyal customers while emphasizing the importance of sustainability in tourism activities (Li, 2024). Research indicates that sustainable tourism certification programs can significantly enhance the sustainability performance of tourism operators, improve their reputation, and create new business opportunities (Bozdaglar, 2023). This highlights the potential for sustainable marketing to not only promote responsible tourism but also drive economic benefits for businesses.

The rise of digital marketing and social media has transformed the landscape of sustainable tourism marketing. These platforms provide opportunities for tourism businesses to engage with consumers, share their sustainability efforts, and influence traveler behavior (Li et al., 2023). Studies have shown that travelers are increasingly seeking sustainable options and are willing to support businesses that demonstrate a commitment to sustainability (Sangkhaduang et al., 2021). The concept of Sustainable Destination Preference (SDP) has become a key determinant of traveler behavior (Musa et al., 2024). It reflects the increasing tendency of travelers to favor destinations that exhibit strong commitments to environmental stewardship, cultural sensitivity, and socioeconomic responsibility (Grandi, 2023). This shift in consumer preferences necessitates that tourism marketers adapt their strategies to highlight sustainable practices and foster a culture of responsible tourism. In addition to marketing strategies, education and awareness-raising actions are essential for promoting sustainable tourism. Educational programs can equip both tourists and industry stakeholders with the knowledge and skills needed to engage in sustainable practices (Adams & Sanchez, 2020).

For example, tourism education can help mitigate issues such as overtourism by fostering a deeper understanding of the impacts of tourism and the importance of sustainability (Sharpley, 2020). Furthermore, community-based tourism initiatives can empower local populations, allowing them to take an active role in tourism development while preserving their cultural heritage and natural resources (Giampiccoli et al., 2020). Furthermore, the tourism industry must address issues such as environmental degradation, social inequities, and the impacts of climate change on tourism destinations (Dzyad et al., 2020). As the industry continues to evolve, ongoing research and collaboration among stakeholders will be essential to develop innovative solutions that promote sustainable tourism and enhance the overall visitor experience.

Although existing literature often emphasizes the marketing-driven demand for sustainable tourism, it lacks a thorough analysis of how local communities actively shape their sustainability narratives through education. Therefore, one of the main research aims of our paper is to identify practical examples of how tourism and education can be seamlessly integrated, while promoting sustainable tourism and fostering sustainability education at the same time.

Additionally, despite the growing role of digital marketing in sustainable tourism (Sangkhaduang et al., 2021), there is limited research on how small communities without a strong digital presence can leverage alternative promotional strategies. This study contributes to bridging this gap by examining how metaphorical storytelling in a rural context can serve as both a tourism promotion tool and an educational medium for sustainability awareness.

Innovative model and action research

A case study on the Ulytau State National Nature Park in Kazakhstan highlights the importance of innovative management models in balancing cultural heritage preservation and tourism growth (Seidualin et al., 2024). In the study, the author demonstrates how integrating cultural narratives into branding strategies—such as the ethno-aul concept—can enhance destination authenticity and visitor engagement. On the other hand, metaphor-based branding, as explored in this study, serves as an alternative innovative approach by shaping how tourists perceive and interact with a destination's identity. Furthermore, the study also stated that sustainable tourism development relies on collaboration among multiple stakeholders, including local communities, government agencies, businesses, and researchers (Seidualin et al., 2024). This aligns with the action research methodology adopted in our research, where participants from multiple countries engage directly with local stakeholders to co-develop tourism promotion strategies. By embedding community values into metaphorical storytelling, this research seeks to contribute to both sustainable tourism branding and educational outreach, reinforcing the role of participatory approaches in destination marketing.

MATERIALS AND METHODS

In this research, the research team adopted the method of action research. Reason & Bradbury (2008: 4) define it as "a participatory process concerned with developing practical knowing in the pursuit of worthwhile human purposes. It seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities" (as cited in O'Leary & Coghlan, 2022: 238).

O'Leary & Coghlan (2022) noted that action research values practical knowing, involves stakeholder participation, and acknowledges context and complexity, making it an ideal approach at the regional level. This view is supported by Fricke and Hofmaier (1996). From O'Leary and Coghlan's study, it can be concluded that the collaborative nature of action research helps bridge the gap between theoretical ideals and practical realities.

A group of university lecturers, undergraduate students and professionals all interested in sustainability and community development spent eight days in the village of Ban Nong Bua, actively engaging with the community. During the stay, the members of the group interviewed the mayor and fishermen, visited local farms, led activities for children at the local primary school, participated in locally held meditation and massage workshops, and conversed with local villagers and tourists from other parts of Thailand. These activities fostered active participation and collaboration with stakeholders to generate actionable knowledge. Based on the special interests of the participants, right at the beginning several research teams were formed. The team consisting of the authors of this paper and creators of the educational booklet focused on the educational aspects of sustainability as it is related to tourism and the local community. To progress with the research, the team held regular brainstorming sessions and sought symbols and concepts that best represented the village, ultimately arriving at the idea of a beehive. This metaphor reflects the co-construction of knowledge and the instigation of actions to address local issues. With this metaphor in mind, the participants considered ways to enhance tourism promotion, decided on the appropriate promotional media, and chose to create a booklet, demonstrating the practical application of knowledge generated through action research.

This process is participatory, reflective, and aimed at creating positive change, embodying the key elements of action research. The flowchart below Figure 1 shows the steps taken by the research team to carry out the action research.

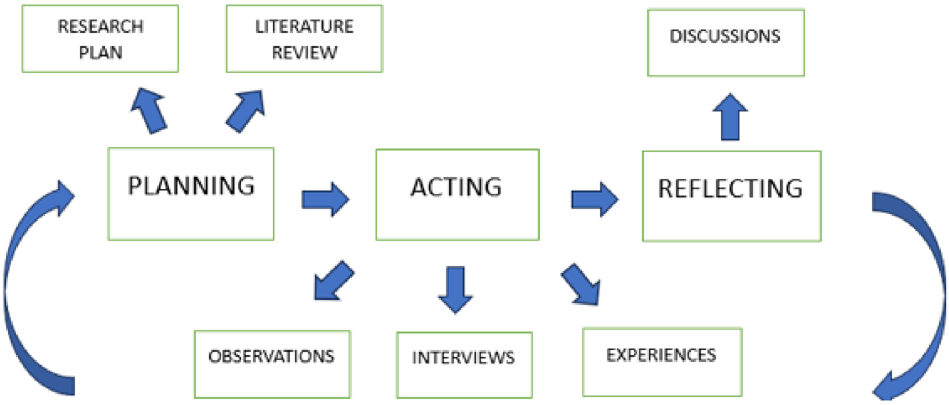

Figure 1. Flow chart of the methodology (Source: created by the authors)

RESULTS AND DISCUSSION

The beehive metaphor for the village is rooted in the numerous similarities between the two, which makes it a comprehensive, expanded trope having a strong explanatory and illustrative power. Like a beehive, the village thrives on cooperation, unity, and a strong sense of community. The villagers resemble a large family, where everyone knows each other and maintains close relationships. In fact, they all came from the same ancestor.

Additionally, the villagers are committed to supporting their local economy. The mayor's resort, for example, uses ingredients from nearby farms and sells locally produced goods, reflecting how bees gather nectar from their surroundings to sustain their hive. This kind of act also achieves sustainability.

Much like bees that always return to their hive, the villagers rarely leave the community. If they do, they often return, bringing back knowledge and skills, as exemplified by the mayor, who studied abroad and returned to help his village.

Just as bees have distinct roles—such as queens, drones, and worker bees—every villager has a specific role that contributes to the community's success. The people here mostly grow crops and fish for a living. For tourism, some provide beach resorts, restaurants, and massage services. And the mayor, like a queen bee, oversees and guides the village.

Community support is a core value in Ban Nong Bua, where villagers regularly visit and assist the elderly, monitoring their health and living conditions, much like the nursing bees that care for their hive. They also engage in spiritual practices, such as giving alms to monks, which adds a layer of spiritual nourishment to their communal life.

In terms of communication, bees perform dances to convey information to one another. In Ban Nong Bua, the villagers' favorite free-time activity is dancing aerobics, which strengthens their bonds and fosters a sense of togetherness. These late afternoon dance sessions communicate their unity without words as the participants perform the same movements.

Water, an essential resource for both villagers and bees, plays a vital role in sustaining life. The ocean supports Ban Nong Bua's fishing industry and tourism, just as water is indispensable to bees for hydration, cooling their hives, softening nectar, and feeding their larvae. On the other hand, honey, which is a primary product of bees, symbolizes sweetness and nourishment. Similarly, the village's warm, inviting atmosphere embodies these qualities, making it an attractive destination for visitors. As the ultimate promotional media aimed at both tourists and local schools, the booklet is designed to be both informative and educational. It uses clear, straightforward language and incorporates rhymes, much like a children's storybook, to make the content engaging and enjoyable.

For instance, "Welcome to Ban Nong Bua, our place so grand, together we thrive in this beautiful land". The booklet features illustrations and additional information to help readers connect with the beehive metaphor and better understand the unique qualities of the village. In this paper most illustrations are AI-generated, but the ultimate goal is to make this booklet a work of art. The research team had an art student member who has already started painting the scenes for the booklet pages. Figure 2 shows a painting depicting one of Ban Nong Bua's beaches with fishing boats.

Figure 2. Fishing boats and bees in Ban Nong Bua, Khao Kalok Beach
(Source: painting by Dorina Lehdorfer, 2024, with the permission of the author)

The booklet includes several special design elements. For example, the lotus is used for numbering the pages, symbolizing the village's past when lotuses were abundant a hundred years ago. Another feature is that bees are the main characters instead of humans, since it is more neutral to draw animals to avoid stereotypes.

The booklet consists of eight pages, each highlighting a distinctive feature of the village: "One Big Family", "A Convergent Community", "A Caring Community", "A Helping Community", "A Happy and Fit Community", "A Spiritual Community", "A Water Community" and "A Sustainable Community." Each page introduces a bee character that shares factual information about the village. The names appearing next to the bees are the names of the children th at we collected in the local primary school. . For children, seeing familiar names helps them feel a stronger connection to the story, enhancing their learning experience about bees and sustainability in an engaging way. For tourists unfamiliar with the local language, the inclusion of the visually appealing Thai words adds an aesthetic and cultural element, allowing tourists to "get a taste of the language." Figures 3 and 4 show two pages as examples.

The topic of the page in Figure 3 is "Sustainable Community". The illustration of this page would be three bees happily eating locally-grown potatoes, mangoes, and other foods. The accompanying text would read: "We farm and eat what's fresh and sweet, sustainable living, what a treat!" In the corner, a bee figure would explain, "We mostly consume local products, achieving sustainability. We serve food using ingredients from nearby farms and sell products from the neighborhood. See the snacks on the table? Buy a package!"

Figure 3. The page illustrating "Sustainable Community" (Source: AI generated illustration based on the authors' ideas)

Another topic is "Caring Community" depicted in Figure 4. The illustration of this page would be several bees doing their daily tasks, some fishing, some farming, and some giving massages. The accompanying text would read: "We contribute to society in every way, like bees who work in a busy array." In the corner, a bee figure would explain, "We mostly grow crops and fish for a living. For tourists, we provide beach resorts, restaurants, and massage services." This gives the tourist a concept of how the local economic system works.

Figure 4. The page illustrating "Caring Community" (Source: AI generated illustration based on the authors' ideas)

The cover page (Figure 5) will display a giant beehive beside the beach with the title "Our Beehive," emphasizing again the importance of the ocean to the village. The booklet will also include an interactive page (Figure 6) at the end, featuring elements of color and counting to help teachers lead educational activities with the children.

Figure 5. The cover page (Source: AI generated illustration based on the authors' ideas)

Figure 6. The interactive page (Source: painting by Dorina Lehdorfer, 2024, with the permission of the author)

On the back cover, a map of the village will be included, highlighting recommended restaurants, hotels, and tourist attractions. This reinforces the tourism promotion theme while showing visitors that the village offers not only beautiful beaches but also a variety of fresh experiences and attractions to explore.

So far, the authors have developed the main content, booklet format, illustration concepts, and gathered the names of the village children. The next step is to finish the illustrations. Once completed, the booklet will be published online in line with the sustainable concept. Tourists will be able to access it through a QR code available at the mayor's resort and local hotel receptions. Additionally, the code will be shared with teachers at the local primary school. With simple, rhyming words, the booklet will also help children learn English easily. Eventually, the authors hope it will become a project that intertwines sustainability, tourism promotion, and education.

Metaphors as a communication tool to enhance tourism promotion and destination branding

The beehive metaphor captures the essence of Ban Nong Bua's communal life, serving as a powerful tool in promoting the village as a unique and appealing destination. By linking the village's social structure and environment to the familiar and positive imagery of a beehive, the metaphor effectively bridges the gap between the local culture and tourists' perceptions. By focusing on cooperation, unity, and a deep connection to the local environment, the metaphor not only attracts visitors but also encourages them to engage more deeply with the village's way of life. As highlighted in the 2021 research by Isakova et al. (2021), tourism acts as a powerful stimulus for cross-cultural communication. By promoting positive cultural images through educational and tourist brochures, these texts facilitate better understanding and appreciation of various cultures and traditions, thereby enhancing cross-cultural awareness.

The role of the beehive metaphor in reinforcing sustainable tourism concepts among visitors

The principles of sustainable tourism are illustrated through the booklet utilizing the beehive metaphor. By embracing environmental, social, and ethical economic practices, both the host community and visitors can derive mutual benefits. The objective is to highlight sustainable tourism practices, inspire visitors to adopt a new lifestyle during their stay in Ban Nong Bua, and ultimately equip them with the knowledge necessary to integrate sustainability into all aspects of their visit.

The booklet itself embodies sustainability by being available in a digital format, accessible through a QR code that allows tourists to view the content on their smart devices instead of using printed materials. As Happ stated, "the use of the smartphone as a marketing tool cannot be ignored in today's marketing activities" (Happ, 2013: 8). By eliminating the use of paper, this eco-friendly approach reduces distribution costs, enhances accessibility, and minimizes environmental impact. Additionally, it functions as an educational resource, raising awareness about responsible travel behaviors and the importance of sustainable practices—both essential for fostering a culture of responsible tourism.

Metaphor-based tourism materials contribute to sustainability education for local communities

The beehive metaphor transcends its promotional function by serving as an effective educational tool for the local community. The booklet, structured around this metaphor, is specifically designed to engage local children by presenting sustainability concepts in a relatable and interactive manner. By incorporating familiar elements—such as the names of local schoolchildren and culturally relevant symbols—the material not only simplifies complex ideas like environmental stewardship and sustainable practices but also instills a sense of pride and responsibility among the younger generation.

CONCLUSION

This study has demonstrated the significant role that metaphors can play in tourism promotion, particularly in capturing and conveying the unique cultural and environmental aspects of a destination. The beehive metaphor, representing the village of Ban Nong Bua, successfully captures the essence of its lifestyle and sustainable practices, making it more accessible and attractive to potential tourists. Moreover, this metaphor serves a dual purpose by not only enhancing tourism promotion but also contributing to sustainable education for local children.Furthermore, sustainability itself can serve as a competitive advantage to distinguish the destination from other places, and a sustainable tourism approach can not only raise stakeholders' awareness of the environment but encourage responsible tourists' behaviors and deeper engagement with the local community. The action research approach employed in this study highlights how sustainability can be addressed through simple yet impactful tools, offering valuable insights into the multifaceted applications of metaphors in tourism.

However, a key limitation of this research is that the long-term impact of the beehive metaphor on tourist engagement and community development cannot be fully assessed at this stage. The outcomes of the booklet and its influence on both tourists and the local community will require further observation and analysis over time

Future research should focus on quantitatively and qualitatively measuring the impact of metaphorical frameworks like the beehive on tourist behavior and community dynamics. Additionally, exploring the broader application of such metaphors in global tourism marketing strategies could uncover new ways to promote destinations with distinct cultural and environmental characteristics. The potential for metaphorical thinking to enhance sustainability education, both within and beyond the context of tourism, presents another promising avenue for further investigation.

Author Contributions: Conceptualization, A.M., Ch.L.Ts. and J.S.T; methodology, A.M., Ch.L.Ts. and J.S.T; software, Ch.L.Ts.; validation, A.M.; formal analysis, A.M.; investigation, Ch.L.Ts. and J.S.T.; data curation, A.M. and Ch.L.Ts.; writing - original draft preparation, A.M., Ch.L.Ts. and J.S.T.; writing - review and editing, A.M. and Ch.L.Ts.; visualization, A.M. and Ch.L.Ts.; supervision, A.M.; project administration, A.M. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgments: The authors wished to express their gratitude to Prof. Dr. Miklós Bánhidi, who organized the trip during which the authors had the opportunity to carry out the research detailed in the paper.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Adams, K., & Sanchez, P. (2020). Tourism as industry and field of study: using research and education to address overtourism. In H. Séraphin & A. Yallop (Eds.), *Overtourism and education: strategies for sustainable futures*, 43–59, Routledge. https://doi.org/10.4324/9781003031765-5

Bozdaglar, H. (2023). The use of sustainable tourism certification programs and their impact on the sustainability of tourism development: evidence from north Cyprus. *International Journal of Science and Management Studies*, *6*(1), 296–300, https://doi.org/10.51386/25815946/ijsms-v6i1p126

Burgoyne, C., & Mearns, K. (2019). Sustainable tourism/ecotourism, In: W. Leal Filho, A. Azul, L. Brandli, P. Özuyar & T. Wall (Eds.), *Responsible consumption and production. Encyclopedia of the UN sustainable development goals*, 1–9, Springer, Cham. https://doi.org/10.1007/978-3-319-71062-4_22-1

Carston, R. (2018). Figurative language, mental imagery, and pragmatics. *Metaphor and Symbol*, *33*(3), 198–217. https://doi.org/10.1080/10926488.2018.1481257

Cracolici, M. F., & Nijkamp, P. (2009). The attractiveness and competitiveness of tourist destinations: A study of Southern Italian regions. *Tourism management, 30*(3), 336–344. https://doi.org/ 10.1016/j.tourman.2008.07.006

Dann, G. (1996). *The language of tourism: a sociolinguistic perspective*. Wallingford: CAB International. https://doi.org/10.1079/9780851989990.0007

Dewi, U. (2016). Metaphors and destination image in Sumedang tourism promotion through social media. *Advances in social science, education and humanities research*, 82, 322–326. https://doi.org/10.2991/conaplin-16.2017.74

Dzyad, O., Redko, V., Krasnikova, N., Mihaylenko, O., & Stasiuk, Y. (2020). On the issue of sustainable development of tourism in the Black Sea countries. *Journal of Geology Geography and Geoecology*, *29*(3), 471–482. https://doi.org/10.15421/112042

Firstianto, V., Tyas, W. P., & Damayanti, M. (2024). Rurality and popularity of village tourism relation on Sumenep village tourism - Indonesia. *GeoJournal of Tourism & Geosites, 55*(3), 1018−1027. https://doi.org/10.30892/gtg.55304-1276

Fricke, W., & Hofmaier, B. (1996). Action research and regional development. In S. Toulmin & B. Gustavsen (Eds.), *Beyond theory: changing organizations through participation*, 83–88, Amsterdam: John Benjamins. https://doi.org/10.1075/dowi.2.08fri

Giampiccoli, A., Mtapuri, O., & Dłużewska, A. (2020). Investigating the intersection between sustainable tourism and community-based tourism. *Tourism, 68*(4), 415–433. https://doi.org/10.37741/t.68.4.4

Gibbs Jr, R. W. (2023). Pragmatic complexity in metaphor interpretation. *Cognition*, 237, 105455. https://doi.org/10.1016/j.cognition.2023.105455

Grandi, L.K. (2023). Branding, diplomacy, and inclusion: the role of migrant cuisines in cities' local and international action. *Societies, 13*(7), 1−18. https://doi.org/10.3390/soc13070151

Guo, Y., Jiang, J., & Li, S. (2019). A sustainable tourism policy research review. *Sustainability*, *11*(11), 3187. https://doi.org/10.3390/su11113187

Happ, É. (2013). Innovatív marketingkommunikációs megoldások a turizmusban – okostelefonos alkalmazások lehetőségei. [Innovative marketing communication solutions in tourism - the potential of smartphone apps] In: F, Darabos & Zs. Ivancsóné Horváth (Eds.), *Turizmus ízei: V. Nemzetközi Turizmus Konferencia 2013: Tanulmányok* [Tastes of Tourism: 5th International Tourism Conference 2013: Proceedings] 91–98, Győr: NyME ACsJK.

Isakova, E., Kryukova, N., & Aleksandrova, E. (2021). Discourse of tourism: rhetoric and metaphorical aspects (in education and tourist brochures). *E3S Web of Conferences*, 273, 09039. *EDP Sciences*. https://doi.org/10.1051/e3sconf/202127309039

Jaworska, S. (2017). Metaphors we travel by: a corpus-assisted study of metaphors in promotional tourism discourse. *Metaphor and Symbol*, *32*(3), 161–177. https://doi.org/10.1080/10926488.2017.1338018

Kumari, A., & Thakur, P. (2023). Sustainable tourism: a review of current practices and future directions-coalescence of social media and e-commerce. *International Journal of Research Publication and Reviews, 4*(5), 1655–1662. https://doi.org/10.55248/gengpi.234.5.40417

Lakoff, G., & Johnson, M. (1980). *Metaphors We Live By*. University of Chicago Press. https://doi.org/doi:10.7208/chicago/9780226472492.003.0007

Li, J. (2024). Sustainable marketing in enhancing customer consumption in tourism industry in China. *Journal of Innovation and Development*, *7*(1), 7–13. https://doi.org/10.54097/bw597613

Li, M., Fu, H., & Jiang, S. (2023). What is sustainable tourism in social media? Evidence from tweets. *Problems and Perspectives in Management*, *21*(1), 204–218. https://doi.org/10.21511/ppm.21(1).2023.18

McQuarrie, E. F., & Mick, D. G. (1996). Figures of rhetoric in advertising language. *Journal of Consumer Research*, *22*(4), 424–438. https://doi.org/10.1086/209459

Mihelj, V. (2010). New tourist products for new tourists' expectations. *Tourism & Hospitality Management*, *18*(1), 1075–1085. https://doi.org/10.20867/thm.18.1.8

Morgan, N., & Pritchard, A. (2012). *Advertising in tourism and leisure*. Routledge. https://doi.org/10.4324/9780080498898-10

Muhammad, N. N., & Rashid, S. M. (2014). Cat metaphors in Malay and English proverbs. *Procedia - Social and Behavioral Sciences*, 118, 335–342. https://doi.org/10.1016/j.sbspro.2014.02.046

Musa, H. G., Fatmawati, I., Nuryakin, A., & Suyanto, M. (2024). Exploring how sustainable destination preference mediates the effects of tourists' motivation on satisfaction. *GeoJournal of Tourism and Geosites,* 54, 941−952. https://doi.org/10.30892/gtg.542spl18-1269

Newmark, P. (1988). *A textbook of translation*. Hemel Hempstead: Prentice Hall International. https://doi.org/10.1017/S0263574700004732

O'Leary, D., & Coghlan, D. (2022). Action research in hospitality and tourism research. In F. Okumus, S. M. Rasoolimanesh & S. Jahani (Eds.), *Contemporary research methods in hospitality and tourism*, 237–251, Emerald Publishing Limited, Bingley. https://doi.org/10.1108/978-1-80117-546-320221016

Reason, P., & Bradbury, H. (2008). *The Sage handbook of action research* (2nd ed.). London: Sage. https://doi.org/10.4135/9781848607934

Rodriguez, I. L. (2009). Of women bitches, chickens and vixens: Animal metaphors for women in English and Spanish. *Culture, Language and Representation* 7, 77–100. https://core.ac.uk/download/pdf/39085608.pdf

Sangkhaduang, T., Visuthismajarn, P., & Kongchouy, N. (2021). The relationship between responsible tourism practice, destination sustainability and quality of life: perspective of marine national park communities. *International Journal of Sustainable Development and Planning*, *16*(5), 895–901. https://doi.org/10.18280/ijsdp.160510

Seidualin, D., Mussina, K., & Mukanov, A. (2025). Leveraging territorial branding for sustainable development and tourist attraction: Case of Ulytau, Kazakhstan. *Gejournal of Tourism and Geosites*, *58*(1), 61–77. https://doi.org/10.30892/gtg.58106-1391

Semino, E. (2008). Metaphor in discourse. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511816802.015

Sharpley, R. (2020). Tourism, sustainable development and the theoretical divide: 20 years on. *Journal of Sustainable Tourism*, *28*(11), 1932–1946. https://doi.org/10.1080/09669582.2020.1779732

Štreimikienė, D., Švagždienė, B., Jasinskas, E., & Simanavičius, A. (2020). Sustainable tourism development and competitiveness: the systematic literature review. *Sustainable Development*, *29*(1), 259–271. https://doi.org/10.1002/sd.2133

Tobing, A. P. (2018). Event structure as a basis of semantic processing of familiar metaphors. *Cognitive Systems Research*, 49, 24–32. https://doi.org/10.1016/j.cogsys.2017.10.002

Wijanarto, Z. M. (2020). The Figurative Meaning of Metaphorical Expression In "Raja Ampat" Article on Indonesia, Travel Website. *Jurnal Dinamika*, *1*(2), 134–160. https://doi.org/10.18326/dinamika.v1i2.70-96

Yang, Z. T., Ruan, W. Q., Zhang, S. N., & Cheng, Z. C. (2024). Revealing the metaphorical code: heterogeneous effects and mechanisms of tourism advertising style in cultural heritage sites. *Journal of Hospitality and Tourism Management*, 59, 263–275. https://doi.org/10.1016/j.jhtm.2024.05.001

Article history: Received: 07.02.2025 Revised: 09.05.2025 Accepted: 03.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1136-1146
DOI 10.30892/gtg.602spl11-1487

INVESTIGATION OF THE FACTORS AFFECTING TOURISM DEVELOPMENT PANEL CAUSALITY ANALYSIS: THE CASE OF BRICS COUNTRIES

Alig BAGHİROV [1*], Teymur SARKHANOV [2]

[1] Azerbaijan State University of Economics (UNEC), Research Center for Monetary Economics and Financial Technology, Baku, Azerbaijan ; Istanbul University, Economics Department, Turkey; aliq.bagirov@unec.edu.az (A.B.)
[2] Azerbaijan State University of Economics (UNEC), Department of Economics and Business, Baku, Azerbaijan; Western Caspian University, Baku, Azerbaijan. Khazar University, Mehseti Str. 41, Baku, Azerbaijan; teymur.sarkhanov@gmail.com (T.S.)

Citation: Baghirov, A., & Sarkhanov, T. (2025). Investigation of the factors affecting tourism development panel causality analysis: The case of BRICS countries. *Geojournal of Tourism and Geosites*, 60(2spl), 1136–1146. https://doi.org/10.30892/gtg.602spl11-1487

Abstract: This study investigates the causal relationships among the contribution of tourism income to GDP, international tourist arrivals, and capital investment in the travel and tourism sector in BRICS countries-Brazil, Russia, India, China, and South Africa-over the period 1995 to 2020. Using the Emirmahmutoğlu and Köse Panel Causality Test, which accounts for cross-sectional dependence and heterogeneity among panel units, the study systematically examines both unidirectional and bidirectional causal linkages among the three core variables. The empirical findings indicate a robust bidirectional causality between capital investment in tourism and both the GDP share of tourism income and international tourist arrivals, substantiating the feedback hypothesis. Additionally, the analysis identifies a unidirectional causality from international tourist arrivals to the GDP share of tourism income, thereby supporting the tourism-led growth hypothesis (TLGH). These causal patterns underscore the reinforcing dynamics between tourism development and economic performance in emerging economies. Country-level analyses reveal distinct heterogeneities. Brazil and South Africa exhibit bidirectional causality between capital investment and tourism income, while China and Russia display unidirectional causality from investment to GDP share. In India, a bidirectional link is found solely between tourist arrivals and tourism income. Moreover, the direction of causality between tourist arrivals and investment differs: in Brazil, investment leads to arrivals, whereas in South Africa, arrivals lead to investment. China demonstrates neutrality in some relationships, indicating no statistically significant causal effect. The study presents targeted policy recommendations grounded in these findings. These include increasing tourism-related capital investment, improving infrastructure, expanding international marketing, and enacting tourist-friendly regulations. Specific proposals include enhancing eco-tourism and airport infrastructure in Brazil, and promoting heritage tourism in China. The study acknowledges limitations such as potential endogeneity, omission of post-2020 data-including pandemic - related disruptions - and the exclusion of sociocultural and environmental variables. Nevertheless, it offers strong econometric support for the role of tourism in advancing sustainable economic growth, particularly within diverse and evolving emerging market contexts like those of the BRICS nations.

Keywords: tourism development, tourism growth, panel cointegration analysis, panel causality analysis, economic effects, GDP impact, BRICS countries

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INTRODUCTION

After the Second World War, the tourism sector became an industry, which provides the incentive of development and growth in the communication sector, information and transportation. Tourism has also become more important in economic, political and social terms. The World Tourism Organization (UNWTO) stated that despite the economic shocks experienced over the past 30 years, the international tourism sector has continued to exhibit exceptional growth, making it one of the industries with the fastest growth rates in the world. The number of International tourists worldwide increased from 25 million in 1950 to 278 million in 1980 to 674 million in 2000 and finally to 2.4 billion in 2019. The number of international tourists for Brazil, China, India, Russian Federation and South Africa increased 3.19, 3.50, 8.43, 2.37 and 3.16 times in 2020 compared to 1995, respectively. Meanwhile the international tourism revenues have also been increasing accordingly. The global tourist industry generated 2 billion US dollars in revenue in 1950, 104 billion US dollars in 1980, 495 billion US dollars in 2000, and 14.65 trillion US dollars in 2019. Considering this trend of development, it is estimated that in 2030, worldwide the annual increase of international tourists will be 3.3% between 2010 and 2030, reaching 1.8 billion in 2030, respectively. The foreign exchange revenues from the sale of the tours to international tourists has had a positive effect on the balance of payments of these countries and their GDP’s (UNWTO, 2020). Despite these aggregate trends, BRICS countries exhibit significant economic and structural diversity, necessitating a nuanced analysis of tourism dynamics (see country-specific results in Tables 5 – 7 and Figure 1).

Unlike other goods exported from a country, tourism is also valued as an invisible export or "smokeless industry" as it provides nothing but gifts in the provision of tourism services. Therefore, it is possible to assess the role of tourism

* Corresponding author

revenues and international tourists in the country's economy in terms of the level of economic activity in the country, the international value and grading of the national currency. For this reason, there has been a rise in countries' investments in tourism - the "smokeless industry" (Seghir, 2015). The world Index of Capital investment in Travel and Tourism for Brazil, China, India, Russian Federation, and South Africa has increased by 2.76, 8.77, 10.30, 1.98 and 4.35 times in 2020 compared to 1995, respectively. According to the feedback hypothesis, the increase in the number of international tourists and capital investment in Travel and Tourism results in an increase the tourism income to GDP ratio, as the tourism income to GDP ratio also increases. The Figure 2 in the Appendix shows the tourism income in GDP ratio for the BRICS countries and the entire World. According to the numbers shown in the Graph, the ratio of tourism income in GDP decreased between 2006 and 2010 due to the global financial crisis in 2008.

However, the overall, picture displays an average increase in the ratio of tourism income to GDP in BRICS countries except for China and the Russian Federation. The ratio of tourism income to GDP for Brazil, India, South Africa, and the entire world increased by 2.53, 1.49, 1.75, and 1.22 times in 2020 compared to 1995, respectively. Whereas, the ratio of tourism income to GDP, for China and the Russian Federation decreased by 4.74 and 1.68 in 2020 compared to 1995, respectively (UNWTO, 2020). The purpose of this study is to examine the causal relationships among tourism income's contribution to GDP, international tourist arrivals, and capital investment in the travel and tourism sector within the BRICS countries - Brazil, Russia, India, China, and South Africa - over the period from 1995 to 2020.

By employing the Emirmahmutoğlu & Köse Panel Causality Test, the research aims to identify how these factors interact and influence tourism development, revealing both bidirectional and unidirectional causalities that highlight their interdependent dynamics. Ultimately, the study seeks to provide evidence-based insights for policymakers to enhance tourism's economic impact through targeted investments and strategies in these emerging economies.

LITERATURE REVIEW

The tourism industry significantly influences the social and economic progress of countries. Economically, it brings together a wide range of producers and consumers, while also promoting the exchange of knowledge and connections between nations and individuals through natural, social, and cultural elements. The demand for goods and services to meet people's needs requires their continuous renewal to address emerging desires, ultimately leading to increased income in this sector (Huseynli & Huseynli, 2023). Tourism has long been acknowledged as a key driver of the global economy. Based on the World Travel & Tourism Council's 2023 Annual Research Report, the travel and tourism industry added USD 9.9 trillion to the global economy, accounting for 9.1% of the world's GDP (Liu & Chamaratana, 2025).

In 2019, the tourism industry contributed to 10.6% of worldwide jobs and 10.4% of the global gross domestic product (GDP). Although it faced severe challenges due to the COVID-19 pandemic in 2019 and 2020, which disrupted human movement and social interactions-key pillars of tourism's sustainability-the sector still managed to account for more than 5.5% of global GDP in 2022 (Makhanyela et al., 2024). According to literature, there has been a significant increase in studies conducted in recent years examining the relationship between tourism and economic growth. In this study the relationship between the ratio of tourism income to GDP, the number of arrivals of international tourists and the capital investment in travel and tourism, has been analyzed. Wijesekara et al. (2022) used Granger causality and wavelet coherence to reveal a two-way link between tourism and economic growth across 105 countries. Their study highlights how tourism's economic impact varies by region, suggesting similar dynamics may apply to BRICS nations. This supports the use of panel causality methods to explore diverse factors driving tourism development in these emerging economies.

Rasool et al. (2021) applied panel cointegration and Granger causality tests to confirm a bidirectional relationship between tourism and economic growth in BRICS countries over 1995-2015, emphasizing the sector's role as a key economic driver. Their findings underscore the importance of financial development alongside tourism inflows, providing a foundation for analyzing broader factors influencing tourism development in the BRICS context using similar panel causality approaches. Mishra et al. (2021) investigated the tourism-led growth hypothesis in BRICS countries using panel Granger causality tests, finding mixed evidence of unidirectional and bidirectional causality between tourism receipts and economic growth across the region from 1995 to 2019. Their emphasis on country-specific variations in tourism's economic impact highlights the relevance of applying panel causality analysis to diverse emerging markets like BRICS, where similar heterogeneity may influence tourism development factors.

Empirical tests have been conducted by many researchers to analyze the causal relationship between the ratio of tourism income to GDP with the number of arrivals of international tourism and the capital investment in travel and tourism. Due to the differences in the researches in terms of time schedules, country profiles and survey methods held by researchers, different results were estimated (Pata, 2021). As a result, four different hypotheses can be used to analyze the causal linkages between economic growth, tourism revenues, and the number of tourists described in our study.

i) The tourism-led growth hypothesis (TLGH) proposed by Balaguer & Cantavella-Jordá (2002) is based on the idea that tourism with an export focus is a strong economic growth driver. According to TLGH, the rise in the proportion of tourism income to GDP and the quantity of foreign visitors, two elements that affect tourism, would lead to new investment and employment prospects. Therefore, tourism will contribute to economic growth. Resultantly, TLGH demonstrates a unidirectional causal relationship between tourism and economic growth (Balaguer & Cantavella-Jorda, 2002).

Dritsakis's study in 2004 testing TLGH by applying test for causality by Granger and the Multivariate Auto-Regressive model in Greece's research on the impact of international tourism revenue and exchange rates on economic growth between the years 1960-2000. The study's conclusions suggest that foreign tourism earnings and the value of currency have a favorable impact on economic expansion (Dritsakis, 2004). In their research, Kum et al. (2015) examined the link between the number of foreign visitors and GDP for 11 countries for the period 1995-2013 using DOLS and FMOLS panel co-integration techniques and a causality test. The rise in foreign visitors was found to have a long-term beneficial impact on GDP and TLGH, according to the estimation results of the DOLS and FMOLS co-integration methodologies. The results of the causality test showed that economic expansion has a one-way impact on tourism. The economically driven tourist growth theory was been proven by a unidirectional causality linking economic growth to tourism. The Granger causality approach was utilized in Ribeiro's analysis to look at the connection between real exchange rate, GDP, tourism revenues, and foreign direct investments between 1997 and 2018. As a result of tests, a unidirectional relationship was found among tourism revenues, real exchange rate and foreign direct investments to GDP and therefore TLGH was also proven in this study. Furthermore, the results of studies by Solarin (2018), Gunduz & Hatemi-J (2004), Chiu & Yeh (2017), Tang & Tan (2015), Al-Mulali et al. (2014), Aslan (2014), and Ertugrul & Mangir (2015) were also compatible with TLGH.

ii) According to the economically driven tourism growth hypothesis (EDTGH), expansion fosters tourism's growth and opens up new employment prospects through raising industry demand. As the economy of a country grows, the income of the society also increases. Increasing incomes increase the level of welfare and this creates touristic and recreational needs amongst people. Thus, the increase in tourism demand and the rise in touristic expenditures accelerate investments for tourism. As a result, the EDTGH shows a one-way causal association among economic growth, capital investment in travel and tourism, and tourism-related revenue. The relationship between economic growth, real tourism revenues, and the number of tourists per capita in OECD and non-OECD (including Asia, Latin America, and Sub-Saharan Africa) countries between 1990 and 2002 was examined by Chien-Chiang Lee & Chun-Ping Chang using long-run cointegration (FMLOS) and causality tests. As a result, real tourism revenues and the number of tourists per capita were found to have unidirectional causality ties with economic growth in OECD nations and bidirectional causality relationships between variables in non-OECD countries (Lee & Chang, 2008). In a study published by Antonakakis et al. (2015) using monthly data for 10 European nations for the period between 1995 and 2012, the Granger causality test was conducted to establish the relationship between economic growth and the tourism industry. As a result, it was found that the economically driven tourism growth hypothesis (EDTGH) and the tourist-led economic growth hypothesis (TLGH) are time-dependent and may vary by country (Antonakakis et al., 2015). Additionally, the researches carried out by Ghosh (2011), Oh (2005), Narayan (2004), Tang & Jang (2009), and Payne & Mervar (2010), also proved the economically driven tourism growth hypothesis (EDTGH), shows that tourism factors improve as economic growth increases.

iii) Thirdly the feedback hypothesis. The theory holds that factors affecting economic growth and those affecting tourism interact and complement one another, demonstrating a causal relationship that runs in both directions. In other words, economic growth fuels the development of tourism-related factors, whereas tourism-related factor growth fuels economic growth. In this study, one of the literature studies on BRICS countries and their hypotheses is the study reviewed by Rasool et al. (2021) using the ARDL co-integration test and Dumitrescu Hurlin panel causality test to examine the linkages between international tourism income per capita, financial development, and GDP per capita for five BRICS countries between 1995 and 2015. The panel ARDL co-integration test results demonstrated a positive long-term co-integration between economic growth, international tourism receipts per capita, and financial development. The "feedback-hypothesis" was thus established in the BRICS nations as a result of the Granger causality analysis's findings that there is a bidirectional causal relationship between international tourism income per capita and economic growth (Rasool et al., 2021). For the years 1990–2007, Seetanah examined the connection between tourism and economic growth in 19 island nations using the Granger causality test. The study's findings revealed that there is a bidirectional causal relationship between tourism and economic growth, demonstrating the validity of the feedback hypothesis (Seetanah, 2011). As a result of the studies conducted by Tugcu (2014), Lee & Chang (2008), Bilen et al. (2017), Lorde et al. (2011), Dogru & Bulut (2018), and Kim & Chen (2006) the feedback hypothesis was found to be applicable. The tourism-led growth hypothesis is supported by Mishra's (2021) study, which used the ARDL regression method to look at the relationship between tourism and economic growth in the context of the BRICS countries between 1995 and 2019. The study found that international tourist arrivals, international tourism revenues, and international tourism expenditures all have a positive impact on economic growth (Mishra et al., 2021).

iv) According to the neutrality hypothesis, there is no connection between the two variables, and they have no impact on one another. This theory states that any change in the economy is not attributed to any relationship between tourism and economic growth. According to research by Katircioglu (2009), Ekanayake & Long (2012), Wu et al. (2018), and others, the neutrality hypothesis was applicable in the cases they examined.

MATERIAL AND METHOD

Data

In the model, the causality between the ratio of tourism income to GDP, capital investment in travel and tourism, and the number of foreign tourist arrivals was examined. In order to analyze the data set obtained from sources presented in Table 1, the panel time series analysis was performed with the STATA 2017, GAUSS 16 and E-Views 12 package programs, which are accepted as statistical and econometric program packages. Thus, the dependent and independent variable data of five BRICS countries between the 1995-2020 periods were selected.

According to the statistical results of the collected data, all data included in the analysis was converted into logarithmic form, taking into account the fold differences between the observation values. Table 1 below shows the main sources, units, definitions and abbreviations from which the data was obtained. Descriptive statistics of these variables are presented in Table 2, revealing the logarithmic transformation applied to address fold differences.

Table 1. Independent and Dependent Variable by data source

Symbol	Definition	Unit	Source
TG	Ratio of tourism income in GDP	Ratio 0-1	The World Bank, www.data.worldbank.org
TN	The number of arrivals of international tourism	Million people	The World Bank, www.data.worldbank.org
TI	Capital investment in Travel and Tourism	Billion US ($)	Trade and Competitiveness Data www.tcdata360.worldbank.org
Dates and Countries using in the Analysis			
Name of Countries			**Dates**
Brazil, Russian Federation, India, China, South Africa (BRICS Countries)			Between 1995 – 2020 (Total 26 year)

Table 2. Descriptive statistics of variables used in the model

Variable	Observations	Mean	Std. dev.	Min	Max
TG	130	-2.675	1.186	-5.926	-0.894
TN	130	2.616	1.226	0.689	5.091
TI	130	2.570	1.215	0.300	5.242

In our study, a balanced panel data was established with 130 observations for all countries, and the series and descriptive statistics of the dependent and independent variables included in the research were shown in Table 2 and Figure 1.

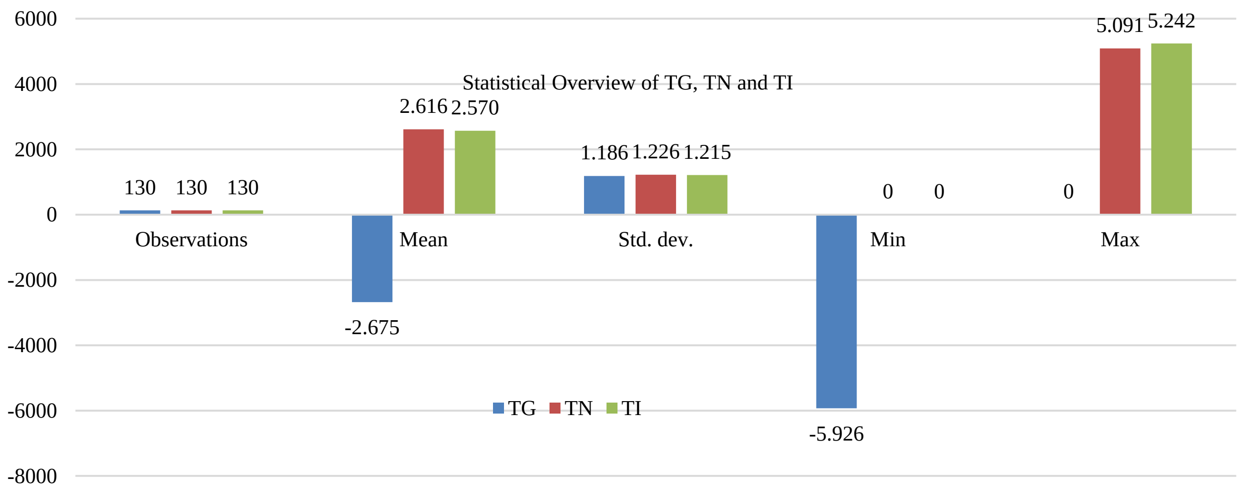

Figure 1. Descriptive statistics of variables used in the model

Method

The empirical analysis of the study was implemented in three stages to examine the relationship between the tourism income to GDP ratio, travel and tourism capital investments, and the number of international tourism arrivals. In the first stage, the model was tested for panel cross-sectional dependence using the Breusch-Pagan, LM Pesaran scaled LM and Pesaran CD. In the second stage, the stationarity levels of the variables were analyzed using the CIPS test for unit roots developed by Pesaran, which considers the cross-section dependence of the series. Finally, Emirmahmutoğlu and Köse test for panel causality was used to establish whether a causality relationship existed between the variables. While the Emirmahmutoğlu and Köse Panel Causality Test accounts for heterogeneity and cross-sectional dependence (see Table 3), we recognize potential limitations such as endogeneity and model specification biases. To ensure robustness, future analyses could incorporate additional tests, such as the Dumitrescu-Hurlin approach, to validate the causal relationships observed in Tables 5-7. These steps would further address unobservable factors that might affect the accuracy of our results.

Cross-Sectional Dependence Tests

According to the results of the Cross-Sectional Dependence test, economic integration between nations or unions grew as a result of the world's countries' burgeoning economic cooperation and globalization. Increasing economic integration between countries has made countries economically dependent on each other. It is foreseen that it is inevitable that economic shocks and mobility in a country or unit will affect other countries or unit at different levels (Demez, 2021). When working in panel data models, the cross- sectional dependence amongst countries or entities should be taken into account. If the cross- sectional dependence is ignored, serious erroneous parameters may occur in the estimation results (Chudic & Pesaran, 2013). Therefore, it is important to test both as variables and as a model in order to avoid erroneous parameters and to measure whether there is a cross-sectional dependence between the units (Ugur, 2021). For the cross-sectional dependence between units not to cause biased results in analysis using panel data, first-generation tests in case of cross-sectional independence and second-generation tests in case of cross-sectional dependence tests and estimators should be used (Aydin & Turan, 2020). There are a number of tests in the literature to identify cross-sectional dependence. In this study, Breusch-Pagan (1980) LM_{BP}, Pesaran (2004) scaled LM and Pesaran (2004) CD tests were conducted to check for cross-sectional dependence.

Breusch and Pagan (1980) Test

The correlation coefficients of the residuals serve as the foundation for the Lagrange Multiplier test at $T \rightarrow \infty$ cases, while N is constant in the Breusch and Pagan (1980) test. LM_{BP} test founded on the correlation between errors bρij and the test statistics generated using the following equation (Breusch & Pagan, 1980).

$$LM_{BP} = T\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{p}_{ij}^2 \qquad (1)$$

$(X^2; \frac{N(N-1)}{2})$ at Chi-square asymptotic distribution and degrees of freedom in case of (T> N).

Where, the $\hat{p}_{ij}^2$ indicates the sample predictived cross-section correlation coefficients value of the equation between the residuals. According to Breusch & Pagan (1980) LM_{BP} test, the no dependence in cross-sections null hypothesis is tested against the alternative hypothesis of unit dependence between cross sections.

Pesaran scaled LM Test

Pesaran (2004) criticized the LM BP test's declining potency as the number of cross-section units (N) increased and even the test's inapplicability in situations where $N\rightarrow\infty$. Thus, he recommended by overcoming these problems, the following scaled version of CD_{LM1} that for testing the hypothesis for existence of cross dependence even for large N and T values:

$$CD_{LM1} = \sqrt{\frac{1}{N(N-1)}}\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}(T\,\hat{p}_{ij}^2 - 1) \qquad (2)$$

According to Pesaran (2004) CD_{LM1} test, presumably, there is no cross-sectional dependence when $T\rightarrow\infty$ *ve* $N\rightarrow\infty$. However, in cases where N>T, the CD_{LM1} test shows significant distortions and the deviations increase as N gets larger (Pesaran, 2004).

Pesaran CD Test

In order to overcome the problems of significant distortions and the increase in deviations as N gets larger, Pesaran (2004) developed the test statistics consists of the sum of the correlation coefficients between cross-section residuals. According to Pesaran (2004) CD_{LM2} test, the absence of cross-sectional dependence is also presumed when $T\rightarrow\infty$ *ve* $N\rightarrow\infty$ and in the event when the cross-sectional size (N) is greater than the time dimension (T) where (N > T), the test statistic should be applied. Pesaran CD test statistic is calculated with the following formula:

$$CD_{LM2} = \sqrt{\frac{2T}{N(N-1)}}\left(\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{p}_{ij}^2\right) \qquad (3)$$

Under the H_0 hypothesis, this test statistic exhibits a typical normal distribution, demonstrating that there is no correlation between the cross-sections (Pesaran, 2004; Guloglu & Ivrendi, 2010).

The null and alternative hypotheses used for the cross-sectional dependence test are as follows:

H_0: Cov(u_{it}; u_{ij})=0, There is no cross-sectional dependence.

H_a: Cov (u_{it}; u_{ij})≠0, There is a cross-sectional dependence.

In order to interpret the test findings, the null hypothesis cannot be rejected if the estimated probability values are greater than the significance values (Aydin, 2019). First generation panel unit root tests are valid in this situation. In contrast, the null hypothesis is rejected and there is cross-sectional dependence between the units if the estimated probability values are less than the significance values. Second generation panel unit root tests are valid in this scenario (Baltagı, 2008).

Panel Unit Root Tests

According to the cross-section dependence test results from Breusch & Pagan (1980) LM, Pesaran (2004) scaled LM, and Pesaran (2004) CD, which are presented in Table 3 below, the null hypothesis was rejected because the calculated probability values were lower than the significance values at 1 percent, 5 percent, and 10 percent. This indicates that there was cross-sectional dependence between the countries. Thus, the study used second generation unit root tests for panel data (Yerdelen, 2020). Second generation CIPS panel unit root test developed by Pesaran (2004, 2007) were used in the analysis.

CIPS Panel unit root tests

Pesaran CADF unit root tests for panel data is an expanded form of ADF regression with first differences of individual series and cross-sectional means of lag levels. Assuming cross-section dependence, CIPS and CADF tests can be used for cases where both *T>N* and *N>T*. Accordingly, the CADF regression can be written as in formula (4) below (Pesaran, 2007).

$$\Delta Y_{it} = a_i + b_i Y_{i,t-1} + c_i\overline{Y}_{t-1} + d_i\Delta\overline{Y}_t + \varepsilon_{i,t} \qquad (4)$$

where, ΔY_{it} is Critical values of the CIPS test, $Y_{i,t-1}$, $\overline{Y}_{t-1}$ and $\Delta\overline{Y}_t$ is Non-constant, constant and constant trend values based on Least Squares regression, respectively and $\varepsilon_{i,t}$ is the error term. The cross-sectional augmented ADF (CADF) panel unit root test, which is computed for each section unit, is the basis for CIPS test statistics. A cross-sectional enhanced version of the IPS test was proposed by Pesaran.

$$CIPS = N^{-1}\sum_{i-1}^{N} CADF_i \qquad (5)$$

The unit root and stationarity are shown by the null and alternate hypotheses for the CIPS panel unit root tests. The test findings show that the unit root exists since the null hypothesis cannot be rejected because the calculated values are greater than the critical values. In contrast, the null hypothesis is rejected and stationarity exists if the estimated values are lower than the critical value values (Mercan et al., 2015).

Panel Causality Test

The study employed the Emirmahmutolu and Köse causality test for panel data to look at the relationship between capital investment in travel and tourism, the tourism income to GDP ratio, and the number of international tourists arrivals. The main feature of causality test for panel data is a dedicated test for causality on heterogeneity of the coefficients. Additionally, in this method, regardless of whether the variables are stationary or cointegrated, it is assumed that inter-country heterogeneity is valid, and this assumption adds flexibility to the method (Özcan, 2016).

A technique to examine Granger causality was created by Toda & Yamamoto in 1995 and is based on the adjusted VAR model (Gurdal et al., 2021). Emirmahmutoğlu & Köse (2011) Granger test for causality is founded on Toda and Yamamoto test for causality in 2011 (Toda & Yamamoto, 1995). When the series are stable at different levels, that is, when some of the series are I(0) and others are I(1), the Emirmahmutolu and Köse causality test, which considers the cross-sectional dependence, can be applied (Şaşmaz & Yayla, 2018). For further testing for causality, the lagged VAR model (ki + d maxi) is as follows (Emirmahmutoglu & Kose, 2011).

$$Y_{i,t} = a_{1,i} + \sum_{j=1}^{k_i + d\,max_i} \beta_{1,ij} Y_{i,t-j} + \sum_{j=1}^{k_i + d\,max_i} \delta_{1,ij} X_{i,t-j} + \varepsilon_{1,it} \quad (6)$$

$$X_{i,t} = a_{2,i} + \sum_{j=1}^{k_i + d\,max_i} \beta_{2,ij} Y_{i,t-j} + \sum_{j=1}^{k_i + d\,max_i} \delta_{2,ij} X_{i,t-j} + \varepsilon_{2,it} \quad (7)$$

5

Where, d maxi and k_i indicate the maximum integration order and the appropriate lag length of the variables, respectively. t denotes the time component (t = 1, .., T). and N denotes the number of cross-section units (j = 1, .., N). In the Emirmahmutoğlu and Köse panel causality test, null and alternative hypotheses are established as there is no causal relationship among variables and there is a causal relationship among variables, respectively.

RESULTS

As a result of the rise in cooperation and integration between countries due to the globalizing world, macroeconomic variables of countries have become interdependent and economic shocks in any one of the countries directly or indirectly influences the other country. Breusch & Pagan's (1980) LM, Pesaran's (2004) scaled LM, and Pesaran's (2004) CD tests were used to evaluate both the variables and the analysis's model to see if there was any cross-sectional dependence. Table 3 presents the cross-sectional dependence test results, demonstrating significant interdependence across BRICS countries at the 1% level.

Table 3. Cross-Section Dependence Tests Results

Tests for Cross-Sectional Dependence by Variables			
Variables	Breusch-Pagan LM	Pesaran scaled LM	Pesaran CD
TG	138.5645*	28.7479*	11.4672*
TN	132.4205*	27.3741*	11.1614*
TI	192.9339*	40.8053*	13.8021*
Model	107.2119*	21.7372*	9.6817*
* Indicates that the null hypothesis is rejected at the 1% significance level			

The null hypothesis was rejected and there is cross-sectional dependence in terms of the variables and the model, according to the results of the cross-sectional dependence tests for both the model and the variables shown in Table 3. The calculated probability values are smaller than the significance values at 1 percent. There is a cross-section dependency between countries, that is, the economic shock that may occur to any of the countries used in the model will also affect other countries. In this instance, the study should apply second generation unit root tests for panel data.

This study utilized the second-generation heterogeneous test and the CIPS test for unit roots. In addition, it was investigated if this study has constant-trend and/or constant. As the results of the figure 3, 4 and 5 shown in the appendix, this study does not contain trend and for the reason, CIPS unit root test was used at constant. The constant CIPS test for unit roots results are presented in table 4 below.

Table 4. CIPS panel unit root test results

Variables	**Level**		**First Differences**
TG	-1.689		-4.722*
TN	-2.185		-3.822*
TI	-3.034*		-5.133*
Critical values	-2.21 (10%)	-2.33 (5%)	-2.57(1%)
* Indicates that the null hypothesis is rejected at the 1% significance level			

The number of international tourist arrivals, the tourism income to GDP ratio at the first differences (I), and capital investment in travel and tourism at the level (O), as determined by the CIPS panel unit root test results presented in Table 4, were stationary. According to the findings of the unit root test performed by the CIPS panel and the causality test conducted by the Emirmahmutolu and Kose, which was also used in this study, causality testing is permitted when the results of unit root tests are at both level and first differences. The estimation findings of the causality test conducted using Emirmahmutolu and Kose Panel test for causality to examine the causative association between capital investments in travel and tourism and the number of foreign tourist arrivals and the GDP income ratio are presented in tables 5, 6, and 7 below;

Table 5. Emirmahmutoğlu and Kose Panel Causality Test Results (lntg-lntn)

Countries	H_0: lntn ↛ lntg			H_0: lntg ↛ lntn		
	ki	wi	pi	ki	wi	pi
Brazil	4	395.025	0.000*	4	1.756	0.781
Russian Federation	4	8.568	0.073***	4	3.754	0.440
India	4	44.909	0.000*	4	2.502	0.644
China	3	2.582	0.461	3	4.632	0.201
South Africa	4	54.985	0.000*	4	13.382	0.010*
Model		478.118	0.000*		15.528	0.114
*, ** and *** Indicates that the null hypothesis is rejected at the 1% significance level, respectively						

The Emirmahmutolu and Köse Panel Causality test was used to examine the relationship between the number of international tourists' arrivals and the tourism income to GDP ratio in the article. The test results presented in Table 5 show the existence of a unidirectional causality each of the BRICS countries between the number of international tourism arrivals and the tourism income in GDP ratio and the results obtained have been proven in terms of TLG hypothesis. If test results are investigated in terms of countries, there was a unidirectional causality between the number of international tourism arrivals and the tourism income in GDP ratio for Brazil, Russian Federation, and South Africa. In contrast, India had a bidirectional causality nexus between the number of international tourism arrivals and the tourism income in GDP ratio, no causal nexus was found for China.

Table 6. Emirmahmutoğlu and Kose Panel Causality Test Results (lntg-lnti)

Countries	H_0: lnti ↛ lntg			H_0: lntg ↛ lnti		
	ki	wi	pi	ki	wi	pi
Brazil	4	7.831	0.098***	4	16.707	0.002*
Russian Federation	2	11.652	0.003*	2	0.235	0.889
India	2	1.437	0.487	2	0.296	0.862
China	2	11.570	0.003*	2	0.603	0.740
South Africa	2	8.160	0.017**	2	9.086	0.011**
Model		37.465	0.000*		22.456	0.013**
*, ** and *** Indicates that the null hypothesis is rejected at the 1% significance level, respectively						

The Emirmahmutolu and Köse Panel Causality test was used in the article to examine the relationship between capital investments in travel and tourism and the tourist income to GDP ratio. The test's findings, which are in line with the feedback hypothesis, are reported in Table 6. For all of the BRICS nations, there was a bidirectional causal relationship between capital investments in travel and tourism and the tourism income to GDP ratio.

If the results of analysis are investigated in terms of countries, there was a unidirectional causality from the capital investments in travel and tourism to the tourism income in GDP ratio for Russian Federation and China. In contrast, while Brazil and South Africa have a bidirectional causality nexus between the capital investments in travel and tourism and the tourism income in GDP ratio, no causal nexus was found for India.

Table 7. Emirmahmutoğlu and Kose Test Results for Panel Causality (lnti-lntn)

Countries	H_0: lnti ↛ lntn			H_0: lntn ↛ lnti		
	ki	wi	pi	ki	wi	pi
Brazil	2	14.580	0.001*	2	0.103	0.950
Russian Federation	1	0.477	0.788	1	0.826	0.662
India	2	0.628	0.730	2	0.133	0.936
China	2	0.425	0.514	2	2.289	0.130
South Africa	2	0.258	0.879	2	39.293	0.000*
Model		17.273	0.069***		44.431	0.000*
*, ** and *** Indicates that the null hypothesis is rejected at the 1% significance level, respectively						

The causality nexus between the capital investment in travel and tourism and the number of arrivals of international tourism was analyzed using the Emirmahmutoğlu and Köse test for panel causality. The bidirectional causality relationship between capital investments in travel and tourism and the number of foreign tourist arrivals was found for each of the BRICS nations, as evidenced by the causality test results provided in Table 7, and the findings supported the feedback hypothesis. If the results of analysis are investigated in terms of countries, there was a unidirectional causality between the capital investments in travel and tourism and the number of arrivals of international tourism for Brazil.

In contrast, South Africa had a unidirectional causality nexus between the number of arrivals of international tourists and capital investments in travel and tourism, no causal nexus was found for other countries. For countries where there was no relationship between the variables, the neutrality hypothesis held true.

According to the Emirmahmutoğlu and Köse Panel Causality test analysis presented in Figure 2 of the Appendix, a bidirectional causality relationship was identified between capital investments in travel and tourism, the number of international tourist arrivals, and the tourism income to GDP ratio. However, a unidirectional causality relationship was observed, with causality running from the number of international tourist arrivals to capital investments in travel and tourism.

CONCLUSION

In this article, the nexus between capita investments in travel and tourism, the number of international tourism arrivals and the tourism income in GDP ratio for all BRICS countries was investigated and reported using the Panel causality test. The analysis results can guide policy makers of countries with tourism potential for the development of the tourism sector. For instance, the bidirectional causality in Table 6 underscores the interplay between investments and tourism income, while Graph 1 highlights varying income trends across BRICS nations. Increased capital investments in travel and tourism and the number of international tourism arrivals, which is the financing source of the economic development of countries and creates an increase in tourism revenues would go a long way in ensuring macroeconomic stability. Tourism promoting policies towards BRICS countries should be implemented through augmentation in tourism investments, an increase in tourism revenues, which will have an indirect positive affect on economic growth, and capital investments in travelling sector. Thus, tourism would highly impact on overall economic growth.

If the country-based results of the study and policy recommendations are evaluated, policy makers should consider that the rise in the number of tourism arrivals to Brazil, Russian Federation, India, and South Africa may have a positive effect on the tourism income in GDP ratio. However, there was no correlation noted between the rise in the tourism income in GDP ratio and the number of international tourist arrivals for South Africa. Therefore, it is recommended that the political and economic decision makers of these countries, especially the Chinese government, consider implementing foreign tourist friendly measures in order to raise the number of international tourist arrivals.

While investigating the relationship between capital investments in travel and tourism and the tourism income in GDP ratio, for all BRICS countries except India, it was observed that the capital investment in travel and tourism caused the rise in the tourism income in GDP ratio. Thus, the sustainability of capital investments in current travel and tourism policies will be more effective for the increase in the ratio of tourism income in GDP. For Brazil and South Africa, the ratio of tourism income to GDP and capital investment in travel and tourism are causally related in both directions. The bidirectional causation relationship between capital investments in travel and tourism and the tourism income to GDP ratio demonstrates that sustainable economic growth policies in these nations also have a favorable impact on capital investments in travel and tourism. For Brazil, the direction of causality is between the capital investments in travel and tourism and the number of arrivals of international tourists and for South Africa, the direction of causality is the reverse. No correlation was found between the two variables in other countries.

Policymakers should first determine the investment capital in travel and tourism, and then make adjustments to the number of arrivals of international tourist policies for BRICS countries. A unidirectional causation nexus was found between the number of foreign tourist arrivals and the ratio of tourism income in GDP, while a bidirectional causality nexus was found between the ratio of tourism income in GDP and the capital investments in travel and tourism.

The positive effects of capital investment policies in travel and tourism for BRICS countries show that these policies can increase the number of international tourists and the share of tourism income in GDP. This suggests that countries should align their investment strategies with goals to boost tourism revenue. When these policies are tailored to a country's economic situation, they can become a strong financial tool to achieve desired economic results.

The study is *limited* by its reliance on the Emirmahmutoğlu and Köse Panel Causality Test, which, despite addressing heterogeneity and cross-sectional dependence, may be vulnerable to endogeneity and specification biases, potentially skewing results. The timeframe (1995–2020) excludes recent events like the COVID-19 pandemic, reducing relevance to current tourism trends. It also focuses solely on economic variables, neglecting social, cultural, and environmental factors critical to tourism in the diverse BRICS countries, while the panel approach may mask country-specific differences despite logarithmic data adjustments.

While our panel approach reveals general patterns, the diverse economic and political contexts of BRICS countries (Tables 5-7) caution against overgeneralization. Policies must be tailored to each nation's unique conditions.

Based on the causality results (Tables 5-7) and trends in Graph 1, we propose tailored policies for BRICS countries. For Brazil, where investments drive tourist arrivals (Table 7), investments in airport modernization and eco-tourism facilities, financed through public-private partnerships, could boost arrivals. South Africa, with bidirectional causality (Table 6), should prioritize hospitality upgrades and global marketing campaigns, supported by tax incentives. China, showing no causality in some cases (Table 5), could focus on cultural tourism infrastructure, such as heritage site enhancements, funded by tourism bonds. These targeted measures align with each country's economic conjuncture and tourism potential.

While our analysis focuses on economic outcomes (Tables 5-7), tourism's social and environmental impacts are equally vital in BRICS countries. The rise in tourist arrivals (Table 5) could exacerbate environmental pressures, such as resource depletion, unless offset by sustainable investments (e.g., renewable energy in tourism facilities). Conversely, increased tourism income (Graph 1) offers opportunities to fund social benefits, like local employment, and align with SDGs. Future research should integrate these dimensions to provide a holistic view of tourism development.

Appendix

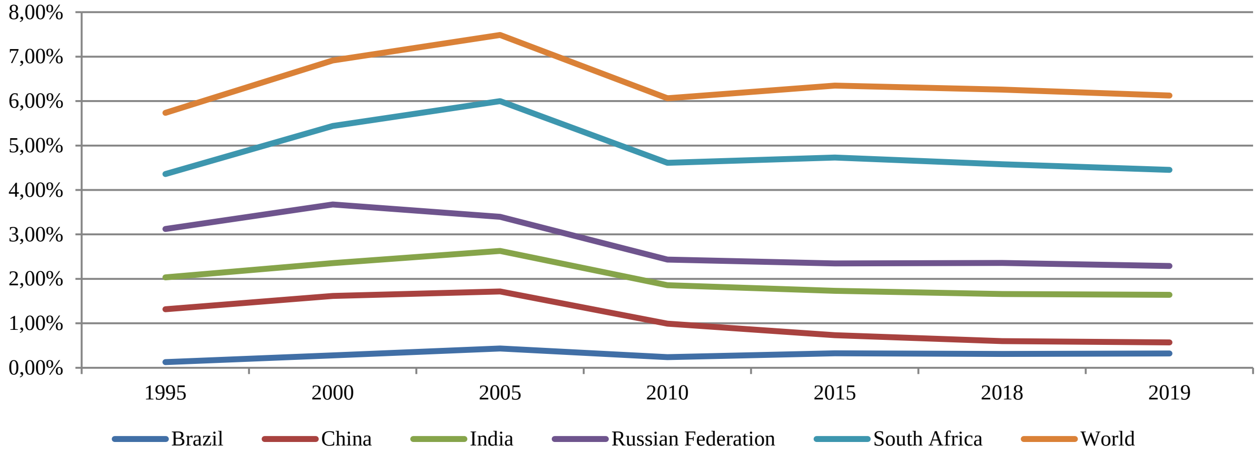

Figure 2. GDP ratio for the BRICS countries and the entire World

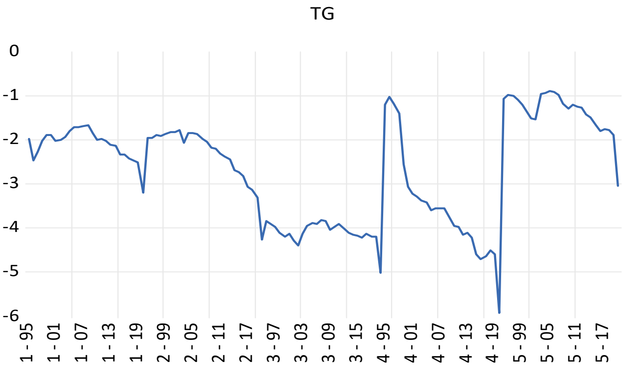

Figure 3. The constant CIPS test for unit roots results

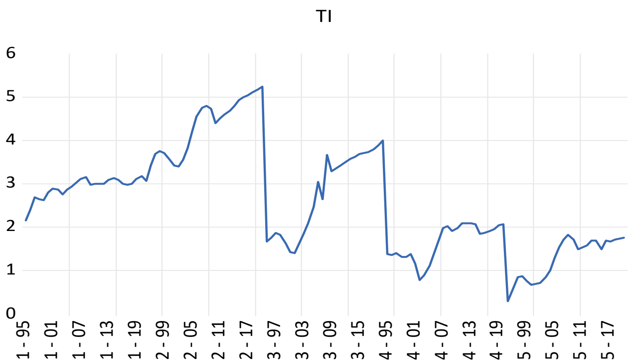

Figure 4. The constant CIPS test for unit roots results

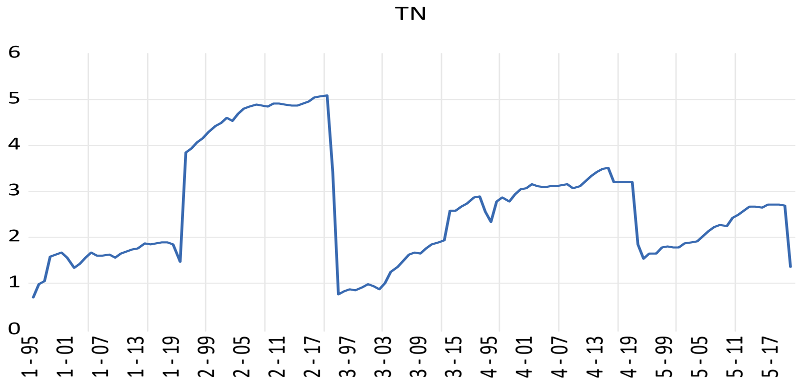

Figure 5. The constant CIPS test for unit roots results

Author Contributions: Conceptualization, A.B. and T.S.; methodology, A.B.; software, A.B.; validation, A.B. and T.S.; formal analysis, A.B.; investigation, A.B. and T.S.; data curation, A.B.; writing - original draft preparation, A.B.; writing - review and editing, T.S.; visualization, A.B.; supervision, T.S.; project administration, A.B. and T.S. Both authors have read and agreed to the published version of the manuscript.

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest

REFERENCES

Al-mulali, U., Fereidouni, H. G., Lee, J. Y., & Mohammed, A. H. (2014). Estimating the tourism-led growth hypothesis: A case study of the Middle East countries. *Journal of Anatolia, 25*(2), 290-298. https://doi.org/10.1080/13032917.2013.843467

Antonakakis, N., Dragouni, M., & Filis, G. (2015). How strong is the linkage between tourism and economic growth in Europe? *Economic Modelling, 44*, 142–155. https://doi.org/10.1016/j.econmod.2014.10.018

Aslan, A. (2014). Tourism development and economic growth in the Mediterranean countries: Evidence from panel Granger causality tests. *Current Issues in Tourism, 17*(4), 363-372. https://doi.org/10.1080/13683500.2013.768607

Aydin, M. (2019). Renewable and non-renewable electricity consumption eeconomic growth nexus: Evidence from OECD countries. *Renewable Energy, 136*, 599-606. https://doi.org/10.1016/j.renene.2019.01.008

Aydin, M., & Turan, Y. E. (2020). The influence of financial openness, trade openness, and energy intensity on ecological footprint: revisiting the environmental Kuznets curve hypothesis for BRICS countries. *Environmental Science and Pollution Research, 27*(34), 43233-43245. https://doi.org/10.1007/s11356-020-10238-9

Balaguer, J., & Cantavella-Jorda, M. (2002). Tourism as a long-run economic growth factor: The Spanish case. *Applied Economics, 34*, 877–884. https://doi.org/10.1080/00036840110058923

Baltagı, B. (2008). Econometric Analysis of Panel Data. *Fourth Edi-tion, West Sussex: John Wiley & Sons*, 284.

Bilen, M., Yilanci, V., & Eryüzlü, H. (2017). Tourism development and economic growth: A panel Granger causality analysis in the frequency domain. *Current Issues in Tourism, 20*(1), 27-32. https://doi.org/10.1080/13683500.2015.1073231

Breusch, T. S., & Pagan, A. R. (1980). Review of Economic Studies. *The Lagrange multiplier test and its applications to model specification in econometrics, 47*(1), 239–253. https://doi.org/10.2307/2297111

Chiu, Y. B., & Yeh, L. T. (2017). The threshold eff ects of the tourism-led growth hypothesis: Evidence from a cross-sectional model. *Journal of Travel Research, 56*(5), 625-637. https://doi.org/10.1177/0047287516650938

Chudic, A., & Pesaran, A. G. (2013). Common Correlated Effects Estimation of Heterogeneous Dynamic Panel Data Models with Weakly Exogenous Regressors. *Federal Reserve Bank of Dallas Globalization and Monetary Policy Institute, 146*, 61. https://doi.org/10.24149/gwp146

Demez, S. (2021). Effects of Environmental Innovations, Renewable Energy Consumption and Economic Growth on CO2 Emission: Panel Data Analysis for Select G-20 Countries . *Anemon - Journal of Social Sciences of Mus Alparslan University, 9*(4), 1007-1017. https://doi.org/10.18506/anemon.946043

Dogru, T., & Bulut, U. (2018). Is tourism an engine for economic recovery? Theory and empirical evidence. *Tourism Management, 67*, 425-434. https://doi.org/10.1016/j.tourman.2017.06.014

Dritsakis, N. (2004). Tourism as a long-run economic growth factor: An empirical investigation for Greece using causality analysis. *Tourism Economics, 10*(3), 305-316. https://doi.org/10.5367/0000000041895094

Ekanayake, E. M., & Long, A. E. (2012). Tourism development and economic growth in developing countries. *The International Journal of Business and Finance Research, 6*(1), 61-63.

Emirmahmutoglu, F., & Kose, N. (2011). Testing for Granger causality in heterogeneous mixed panels. *Econ Model , 28*(3), 870–876. https://doi.org/10.1016/j.econmod.2010.10.018

Ertugrul, H. M., & Mangir, F. (2015). The tourism-led growth hypothesis: Empirical evidence from Turkey . *Current Issues in Tourism, 18*(7), 633-646. https://doi.org/10.1080/13683500.2013.868409

Ghosh, S. (2011). Examining tourism-led growth hypothesis for India. *International Journal of Indian Culture and Business Management, 4*(3), 347-355. https://doi.org/10.1504/IJICBM.2011.040169

Guloglu, B., & Ivrendi, M. (2010). Output fluctuations: transitory or permanent? the case of Latin America. *Applied Economics Letter, 17*, 381-386. https://doi.org/10.1080/13504850701735880

Gunduz, L., & Hatemi, J. A. (2005). Is the tourism-led growth hypothesis valid for Turkey? *Applied Economics Letters, 12*(8), 499-504. https://doi.org/10.1080/13504850500109865

Gurdal, T., Aydin, M., & Inal, V. (2021). The relationship between tax revenue, government expenditure, and economic growth in G7 countries: new evidence from time and frequency domain approaches . *Economic Change and Restructuring*, 20-33.

Huseynli, N., & Huseynli, B. (2023). Panel analysıs on the tourısm sector of selected Medıterranean countrıes. *GeoJournal of Tourism and Geosites, 51*(4spl), 1757–1764. https://doi.org/10.30892/gtg.514spl16-1171

Katircioglu, S. (2009). Revisiting the tourism-led-growth hypothesis for Turkey using the bounds test and Johansen approach for cointegration. *Tourism Management, 30*(1), 17-20. https://doi.org/10.1016/j.tourman.2008.04.004

Kim, H. J., & Chen, M. H. (2016). Tourism expansion and economic development: The case of Taiwan. *Tourism Management, 27*(5), 925-933. https://doi.org/10.1016/j.tourman.2005.05.011

Kum, H., Aslan, A., & Gungor, M. (2015). Tourism and Economic Growth: The Case of Next-11 Countries . *International Journal of Economics and Financial Issues, 5*(4), 1075-1081.

Lee, C. C., & Chang, C. P. (2008). Tourism development and economic growth: Acloser look at panels . *Tourism Management, 29*, 180-192. https://doi.org/10.1016/j.tourman.2007.02.013

Liu, M., & Chamaratana, T. (2025). A qualitative exploration of ecotourism development and sustainability practices in border areas of the greater Mekong subregion. *Geojournal of Tourism and Geosites, 58*(1), 325–334. https://doi.org/10.30892/gtg.58129-1414

Lorde, T., Francis, B., & Drakes, L. (2011). Tourism services exports and economic growth in Barbados. *The International Trade Journal, 25*(2), 205-232. https://doi.org/10.1080/08853908.2011.554788

Makhanyela, D. S., Nkosi, G. S., Tshabalala, S. P., & Gumede, T. K. (2024). Comprehensıve partıcıpatıon: a theoretıcally haıled yet practıcally dısregarded approach to sustaınable ecotourısm. *GeoJournal of Tourism and Geosites, 52*(1), 276–285. https://doi.org/10.30892/gtg.52127-1204

Mercan, M., Peker, O., & Göçer, I. (2015). The Inflationary Effect of The Increases in Crude Oil Prices: Structural Breaks Dynamic Panel Data Analysis For Selected OECD Countries . *Doğuş Üniversitesi Dergisi, 16*(2), 123-137. https://doi.org/10.31671/dogus.2018.65

Mishra, P. K., Himanshu B. R., & Sahoo, D. (2021). International Tourism and Economic Growth: Empirical Evidence from BRICS Countries . *African Journal of Hospitality, Tourism and Leisure, 10*(6), 1994-1958. https://doi.org/10.46222/AJHTL.19770720.202

Mishra, P. K., Sahoo, D., Rout, H. B., Chaini, S. R., & Kumar, P. (2022). Does Tourism Foster Economic Growth in BRICS Region? Empirical Evidence over 1995-2019. *Journal of Environmental Management & Tourism, 13*(4), 1089-1099. https://doi.org/10.14505/jemt.v13.4(60).15

Narayan, P. K. (2004). Economic impact of tourism on Fiji's economy: Empirical evidence from the computable general equilibrium model. *Tourism Economics, 10,* 419–433. https://doi.org/10.5367/0000000042430971

Oh, C. (2015). The contribution of tourism development to economic growth in the Korean econom. *Tourism Management, 26*(1), 39-44. https://doi.org/10.1016/j.tourman.2003.09.014

Özcan, C. C. (2016). International Trade and Tourism for Mediterranean Countries: A Panel Causality Analysis. *Theoretical and Applied Economics, 1*(606), 203-212.

Pata, U. (2021). Tourism and Economic Growth in G10 Countries: Evidence From an Asymmetric Panel Causality Test . *An International Interdisciplinary Journal, 69*(1), 112-126. https://doi.org/10.37741/t.69.1.8

Payne, J. E., & Mervar, A. (2010). Research note: The tourism–growth nexus in Croatia. *Tourism Economics, 16*(4), 1089-1094. https://doi.org/10.5367/te.2010.0014

Pesaran, M. (2004). General Diagnostic Tests for Cross Section Dependence in Panels. *CESifo Working Paper Series No. 1229; IZA Discussion Paper No. 1240.* https://doi.org/10.2139/ssrn.572504

Pesaran, M. H. (2007). A Simple Panel Unit Root Test In The Presence Of Cross-Section Dependence . *Journal of Applied Econometrics, 22*(2), 265-312. https://doi.org/10.1002/jae.951

Rasool, H., Maqbool, S., & Tarique, M. (2021). The relationship between tourism and economic growth among BRICS countries: a panel cointegration analysis. *Future Business Journal, 7*(1), 1. https://doi.org/10.1186/s43093-020-00048-3

Seetanah, B. (2011). Assessing the dynamic economic impact of tourism for island economies. *Annals of Tourism Research, 38*(1), 291–308. https://doi.org/10.1016/j.annals.2010.08.009

Seghir, G. E. (2015). Tourism Spending-Economic Growth Causality in 49 Countries: A Dynamic Panel Data Approach. *Procedia Economics and Finance, 23*, 1613-1623. https://doi.org/10.1016/S2212-5671(15)00402-5

Solarin, S. (2018). Does tourism-led growth hypothesis exist in Mauritius? Evidence from disaggregated tourism markets. *Current Issues in Tourism*(21), 964-969. https://doi.org/10.1080/13683500.2016.1232377

Şaşmaz, M. U., & Yayla, Y. E. (2018). The Causality Relationship Between Taxes And Economic Growth And Human Development: Example Of European Union Transition Economies . *Journal of the Turkish Court of Accounts , 111*, 79-99.

Rasool, H., Maqbool, S., & Tarique, M. D. (2021). The relationship between tourism and economic growth among BRICS countries: a panel cointegration analysis . *Future Business Journal, 7*(1), 1-11. https://doi.org/10.1186/s43093-020-00048-3

Tang, C. F., & Tan, E. C. (2015). Tourism-led growth hypothesis in Malaysia: Evidence based upon regime shift cointegration and time-varying Granger causality techniques. *Asia Pacifi c Journal of Tourism Research, 20*(1), 1430-1450. https://doi.org/10.1080/10941665.2014.998247

Tang, C. H. H., & Jang, S. S. (2009). The tourism-economy causality in the United States: a subindustry level examination. *Tourizm Management, 30*(4), 553–558. https://doi.org/10.1016/j.tourman.2008.09.009

Toda, H. Y., & Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes . *J Econom, 66*(1-2), 225–250. doi: 10.1016/0304-4076(94)01616-8

Tugcu, C. (2014). Tourism and economic growth nexus revisited: A panel causality analysis for the case of the Mediterranean Region. *Tourism Management, 42*, 207-212. https://doi.org/10.1016/j.tourman.2013.12.007

Ugur, B. (2021). The Effect of Exports on Economic Growth in Selected Emerging Market Economies: Panel Co-Integration Analysis. *International Journal Of Economic Studies, 7*(2), 17-29.

UNWTO. (2020). 5 4, 2022 tarihinde Tourism Highlights: https://www.e-unwto.org/doi/pdf/10.18111/9789284419029 adresinden alındı

Wijesekara, C., Tittagalla, C., Jayathilaka, A., Ilukpotha, U., Jayathilaka, R., & Jayasinghe, P. (2022). Tourism and economic growth: A global study on Granger causality and wavelet coherence. *PloS ONE, 17*(9), e0274386. https://doi.org/10.1371/journal.pone.0274386

Wu, T. P., Wu, H. C., Liu, S. B., & Hsueh, S. J. (2018). The relationship between international tourism activities and economic growth: Evidence from China's economy. *Tourism Planning & Development, 15*(4), 365-381. https://doi.org/10.1080/21568316.2017.1324809

Yerdelen, F. (2020). *Panel Zaman Serileri Analizi [Panel Time Series Analysis]*. Beta, Turkiye. 392 p.

Article history: Received: 10.02.2025 Revised: 12.05.2025 Accepted: 04.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1147-1157
DOI 10.30892/gtg.602spl12-1488

THE ARTIFICIAL INTELLIGENCE USAGE AND BENEFITS IN TOURISM MARKETING

Zoltán BUJDOSÓ [1], Noémi VIDA [1], Balázs MÁTÉ [1], Kornél NAGY [1*], Bernadett BRINGYE [2]

[1] Hungarian University of Agriculture and Life Sciences Doctoral School Gödöllő, Hungary, bujdoso.zoltan@uni-mate.hu; (Z.B.); vda.noemi@phd.uni-mate.hu (N.V.); mate@marketingprofesszorok.hu (B.M.); nagy.kornel.2@phd.uni-mate.hu (K.N.)
[2] Hungarian University of Agriculture and Life Sciences, Institute for Rural Development and Sustainable Economy, Department of Investment, Finance and Accounting; bringye.bernadett@uni-mate.hu (B.B.)

Citation: Bujdosó, Z., Vida, N., Máté, B., Nagy, K., & Bringye, B. (2025). The artificial intelligence usage and benefits in tourism marketing. *Geojournal of Tourism and Geosites*, 60(2spl), 1147–1157. https://doi.org/10.30892/gtg.602spl12-1488

Abstract: This study explores the impact of artificial intelligence (AI) on tourism marketing through a comprehensive bibliometric analysis of research published up to 2025. It aims to identify trends, challenges, and opportunities in AI adoption within the tourism industry, focusing on its implications for marketing strategies and customer experiences. In the light of the rapid evolution of AI technologies, the analysis also points to the growing influence of generative AI models, such as ChatGPT, in content creation and customer interaction. A bibliometric analysis was conducted using Web of Science, which involved refining an initial pool of 528 results to 225 relevant articles. Advanced analytical tools, including R (bibliometrix) and VOSviewer, were utilized to scrutinize publication trends, identify key contributors, explore thematic areas, and map research networks. The study integrates a range of analytical techniques, including factor analysis, thematic mapping, and network analysis, to provide a holistic view of the field. Findings indicate a significant surge in AI-related tourism marketing research, with emerging themes encompassing AI's pivotal role in enhancing customer engagement, optimizing experiences, and fostering entrepreneurship. The findings suggest that while AI can significantly enhance operational efficiency, maintaining the human element in tourism services and marketing remain crucial for customer satisfaction. The study also highlights the ethical considerations associated with AI adoption, emphasizing the necessity for balanced implementation to maximize benefits while addressing critical challenges such as data security, authenticity, data privacy, transparency ansd intellectual property concerns. This research contributes novel insights into the rapidly evolving landscape of AI in tourism marketing, offering valuable perspectives for both academics and practitioners. Additionally, it highlights the importance of ongoing research in this area to ensure that AI technologies are harnessed effectively to drive innovation and sustainability in the tourism industry, while exploring the long-term impacts of AI integration on both business performance and customer trust, ensuring that innovation aligns with the core values of the tourism industry. Furthermore, the study's findings have implications for policy makers and industry stakeholders seeking to leverage AI for competitive advantage while ensuring responsible and ethical practices.

Keywords: AI, ChatGPT, data security, content production, SEO, neutral network, research agenda

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INTRODUCTION

We've been living in the era of Web 3.0, the biggest challenges of which are dealing with the excessive flow of information. Information overload exists for almost as long as information does. The 21st century brought an unprecedented growth, (Bawden & Robinson, 2020) using the opportunities provided by artificial intelligence and machine learning. We can already see the signs of artificial intelligence in marketing (Nalbant & Aydin, 2025), it brings huge changes in tourism marketing as well. In recent years, machine learning-based systems have undergone major changes, in their study Wu et al. (2023) presented the process of this development, during which the AI-based systems used today may be able to process large amounts of data and perform specific tasks with the help of language models, efficiently for communication in Table 1. Naimi and co-authors leveraged machine learning to identify geosites (Naimi et al., 2024).

Table 1. List of approaches and impact they make

Approach	Impact	Source
Machine learning	gathering experience, recreating tasks based on the errors	Dairo and Szűcs (2025), Cardona-Acevedo et al. (2025)
Neural network models	the use of signal processing and thinking mechanisms of human brain nerves with the model	Zhang and Liu (2025); Skaar (2020), El Youbi et al. (2025)
Generative models	enabling the execution of tasks by algorithms	Goodfellow et al. (2020), Tomczak (2022)
Large Language Models (LLMs)	performing language tasks, for example understanding languages, writing texts	Devlin et al. (2019), Arora (2024), Adams (2024)

Several large companies, including Facebook, Google, Walmart, Amazon, eBay, ASOS, and IKEA, have used or are using artificial intelligence for their various optimization processes (Haleem et al., 2023). New artificial intelligence-based

[*] Corresponding author

systems are able to create various online marketing content (blog articles, landing pages, ad texts, image and video content). One of the most well-known artificial intelligence programs is ChatGPT (Dai et al., 2024), which already has more than 2,96 billion users and answers users' requests and questions with the help of a language model. In the background, the generative pre-training transformer (i.e. GPT) processes human language using a transformer-based large language model, and then it can create human-like texts such as different stories or even articles used in online marketing (Wu et al., 2023). According to some sources, the ChatGPT training data set based on the 3.5 model consists of nearly 1 trillion words (Wu et al., 2023), but the more recent version 4.0 has already been published, which is available with a subscription, and according to the news, version 5.0 will also be launched soon. The chatbots operating on the OpenAI model are able to generate even marketing content, which can help certain processes and shorten work sessions. However, the quality, legality, and reliability of these contents raise many questions, which we would like to deal with in our article.

Content can be generated with the help of artificial intelligence, by which we mean writing such as blog posts, articles, landing pages, product descriptions, and other marketing materials that are created by machines. This can lead to various problems. Not only mistakes, potential errors, and misinformation caused by artificial intelligence can cause problems, but marketing professionals have to face the lack of uniqueness, personal voice, and other important issues. According to (Melumad & Meyer, 2020) the more space we give to intelligent systems and machine thinkers, the greater the chance that due to an accidental or possibly intentional error, something will go astray. Although AIGC (artificial intelligence-generated content) is fast and cost-effective (Cao et al., 2023), users have to face data protection, legal and ethical challenges. Online marketing has changed a lot in recent years, new marketing tools, opportunities, and applications are constantly appearing (Ivancsóné Horváth et al., 2025). However, search engine optimization is still one of the most effective and most rewarding online marketing tools. Forbes (2024) in his article presenting the latest digital marketing trends put it as follows: SEO can provide organizations with an ROI of up to 700% or more. This tool can also be used very effectively in tourism.

In order to succeed in inbound marketing, it's crucial to develop tailored, original content that resonates with your target audience profiles (Saavedra-Azabache, 2024). An important cornerstone of the methodology is search-engine optimization, as almost half of product purchases begin with a Google search (Sutherland & Wark, 2024). Unique, quality content is an increasingly important ranking factor on search engines, among many other settings (Ziakis et al., 2019). This raises the question of whether it is possible to use artificial intelligence-based systems to create quality, unique content tailored to the needs of potential customers? Large-scale, pre-trained AI models learn automatically from data, which is why it can be said to function similarly to the human brain (Geary, 2021). The great challenge of the Web 3.0 era is the fight against high-level information dumping. There are problems not only with the amount of information, but also with security (Vayadande et al., 2024). Artificial intelligence maps this information, it is questionable whether it can distinguish between facts and expert opinions supported by real data and not necessarily authentic false information, which may even be spread intentionally. Online text content can be divided into two parts: structured and creative writing. Structured writing includes the core of the content, the structured data part, while creative writing adds added value, personal content, i.e. it is tailored to the brand personality, the company, making it attractive to the target audience (See et al., 2017). Creative writing is the real marketing task, which is essential for creating content, artificial intelligence is currently not capable of producing independent, original content (whether text or multimedia content) (Wu et al., 2023). At this point, the question arises whether it is possible to produce quality content with the help of artificial intelligence, since the creation of unique and creative texts is essential in online marketing. Can the uniqueness of a person, his sense of humor, creative ideas, and identification with customers be replaced? Despite the fact that artificial intelligence systems also have a huge vocabulary, they are not necessarily able to use every word in the right place, use familiar word combinations, expressions that make the content more enjoyable and memorable. In the absence of the right tone, the content created by AI can become completely impersonal and spam-like (Bonifacio et al., 2022). Although algorithms are not able to produce unique value, they show countless examples of how well they can learn, even when reworking the ideas of others. This can also be considered creative value, but copying raises various legal and ethical problems, when AI use and paraphrase sources they find on the Internet, but do not refer to them (Fry, 2018). As our test showed, it often conveys the same content in slightly different wording. And plagiarism entails legal problems. Countless legal cases have been started in this regard, so last year the EU issued a related legal position (The Artificial Intelligence Act, 2023). Another problem with these copied contents is that Google also penalizes them (Google Search Central, 2008), which can damage the search engine optimization of the site, which, as explained above, is a very important factor in online marketing. Artificial intelligence is already included in Google's latest guidelines: they explain that content produced with the help of artificial intelligence is not a disadvantage, as long as it meets the other criteria. However, low-quality content is a problem. It is still important for Google to create useful, helpful, original and search-intent-satisfying content (Google Search Central, 2023).

AI systems also raise various data protection and security concerns, which professionals must deal with (Tian, 2022). The widely used ChatGPT is able to memorize conversations, interactions and entered data (Menon & Shilpa, 2023). This opens a new window for data misuse (Wang et al., 2023). This is precisely the reason why the use of ChatGPT was banned in Italy (Eulerich et al., 2024). Even big names like Samsung have already fallen victim to this (Kong et al., 2023). Moreover, we also have to consider the risk of data poisoning (Ding et al., 2019). Notwithstanding the challenges, AI-powered content creation shows immense promise, offering the ability to produce complete articles within minutes (Bevilacqua et al., 2025). AI systems can help in defining the topic, confirming information, searching for data, gathering inspiration, proofreading, correcting incorrect texts, and can even statistically reduce the proportion of unfinished sentences (Michelet, G., Breitinger, F., 2024). In addition to speeding up content production, AI-based systems can also help in SEO processes such as collecting relevant keywords and important related terms (Sharma et al., 2019). It can also help with creative ideas and topic suggestions (Ippolito et al., 2022), but it is questionable how unique these ideas are. That is why it is worth using AI-assisted content creation, when an artificial intelligence system provides assistance to content creators, even creating complete texts and images, but these are reviewed by human intervention before publication. In contrast, many people publish independent content created by artificial intelligence - this is much faster, more efficient, but it excludes the possibility of correcting errors and creativity, and thus risks creating poor-quality content (Wu et al., 2023). In many cases, systems based on various algorithms perform much more efficiently than human work, which can even be used in tourism (Fry, 2018). Artificial intelligence can surpass human operation in many tasks, both in efficiency and speed. Therefore, it is clear that we need to deal with artificial intelligence and its possible uses in online marketing and tourism marketing, but we should not rely entirely on systems. Some concerns of AI particularly in tourism marketing had been articulated by Fallah (Fallah et al., 2023).

MATERIALS AND METHODS

Our study aims to consolidate the current state-of knowledge of AI on Tourism Marketing, based on bibliometric analysis of studies published until end of 2024, similar research was published (Thakur & Kushwaha, 2024; Ezeh & Dube, 2025; Vu et al., 2025; Prerana et al., 2024). It focuses on the following research questions:

Q1. How does the landscape of artificial intelligence research in tourism and hospitality manifest in terms of influential publications, prominent scholars, leading institutions, and contributing nations? What patterns emerge in the collaborative networks of authorship and the interconnections among key research terms?

Q2. What are the primary research themes that dominate the discourse on artificial intelligence in tourism and hospitality? How can these themes be categorized into core driving forces, fundamental and cross-cutting concepts, emerging areas of interest, and niche or peripheral subjects within this field of study?

Q3. Based on current trends and developments, what are the anticipated future trajectories and promising avenues for further investigation in the domain of artificial intelligence applications in tourism and hospitality?

We used Web of Science as source and performed analysis by R (bibliometrix) and VOSViewer. Search query used: ALL = ((tourism marketing) AND ("artificial intelligence" OR "AI")) resulted in 528 elements which was refined based on review of results to ALL=(("marketing" AND "tourism*") AND ("artificial intelligence" OR "AI")) https://www.webofscience.com/wos/woscc/summary/eedc3659-be04-4275-a83a-30c086cfc0ce-01383d268d/relevance/1

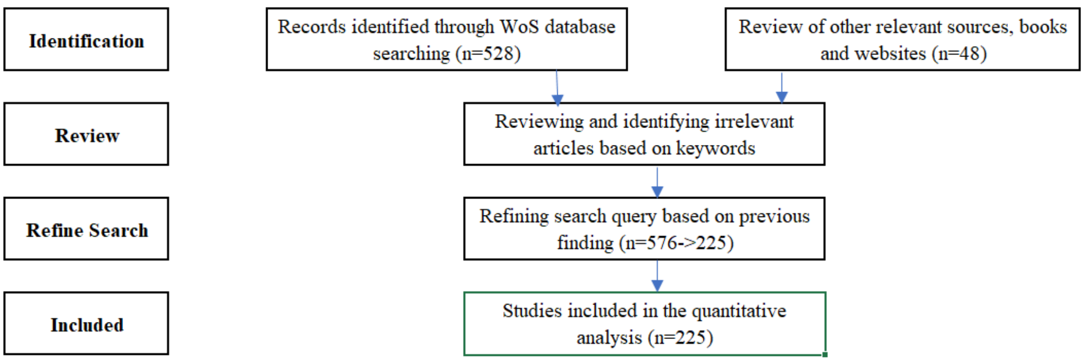

Figure 1. Process of articles selection

The earliest document on AI and Tourism marketing found in this query was published in 2001. Figure 2 shows the distribution of the publications per year between 2001-2024 period. The total result was 225 articles, most of which (176) were published in the past 5 years: 63 in 2024, 51 in 2023, 21 in 2022, 15 in 2021, 16 in 2020 and 10 in 2019. Another slight peak was in 2015.

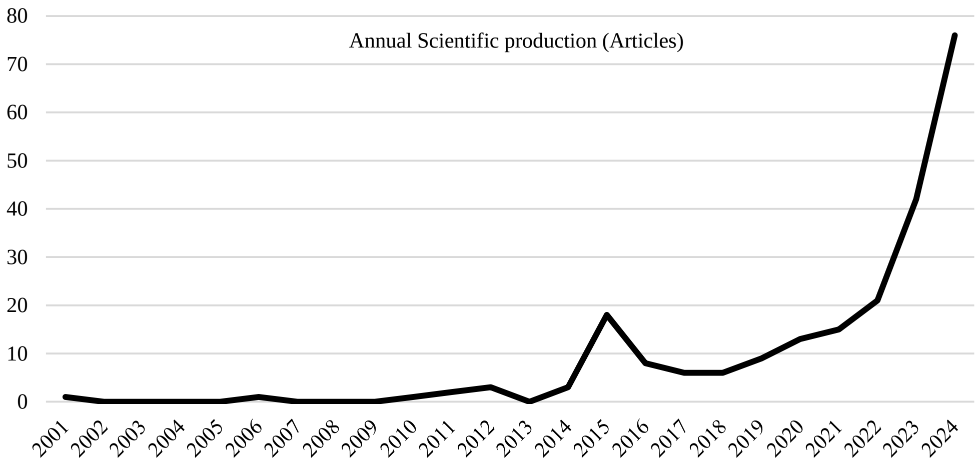

Figure 2. Quantity of annual research on AI and Tourism marketing created using R bibliometrix

Table 2 lists the journals that have been cited mostly. International Journal of Information Management has the largest number of citations, article of (Dwivedi et al., 2023) where they review opportunities and challenges of generative AI content creation. Even though it is not a tourism specific publisher, that article includes several marketing and tourism aspects. Second most cited is Journal of Hospitality and Marketing Management with multiple articles.

Table 2. List of the journals with the largest number of citations

Journal	Authors	Title	Number of citations	Year of publication
International journal of information management	Dwivedi, Kshetri and Wright	"So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy	988	2023
Journal of hospitality marketing & management	Lin, Chi, and Gursoy	Antecedents of customers' acceptance of artificially intelligent robotic device use in hospitality services	186	2020
Tourism management	Wu, Cheng and Ai	A study of experiential quality, experiential value, trust, corporate reputation, experiential satisfaction and behavioral intentions for cruise tourists: The case of Hong Kong	177	2018
Journal of hospitality marketing & management	Chi, Denton and Dogan	Artificially intelligent device use in service delivery: a systematic review, synthesis, and research agenda	149	2020
Journal of hospitality marketing & management	Prentice, Lopes and Wang	The impact of artificial intelligence and employee service quality on customer satisfaction and loyalty	133	2020
International journal of consumer studies	Paul, Ueno and Dennis	ChatGPT and consumers: Benefits, Pitfalls and Future Research Agenda	121	2023
International journal of hospitality management	Prentice, Weaven, and Wong	Linking AI quality performance and customer engagement: The moderating effect of AI preference	120	2020
Journal of tourism futures	Samala, Katkam, Rodriguez	Impact of AI and robotics in the tourism sector: a critical insight	95	2020
Journal of hospitality marketing & management	Gursoy, Li and Song	ChatGPT and the hospitality and tourism industry: an overview of current trends and future research directions	84	2023
Journal of destination marketing & management	Grundner and Neuhofer	The bright and dark sides of artificial intelligence: A futures perspective on tourist destination experiences	79	2020

A total number of 703 authors contributed to the publications and the most relevant productivity over time is shown in Figure 3. The most productive are Sara Quach and Park Thaichon, with 11 articles, all published in 2023. Ana Isabel Rodrigues, follows them with 6, with a smooth distribution over the past 12 years. Antonia Correia, Dolores M Frias-Jamilena, Francisco Peco-Torres, Catherine Prentice, Anamaria-Catalina Radu, and Hung Che Wu have 5 and Chi Han Ai has 4.

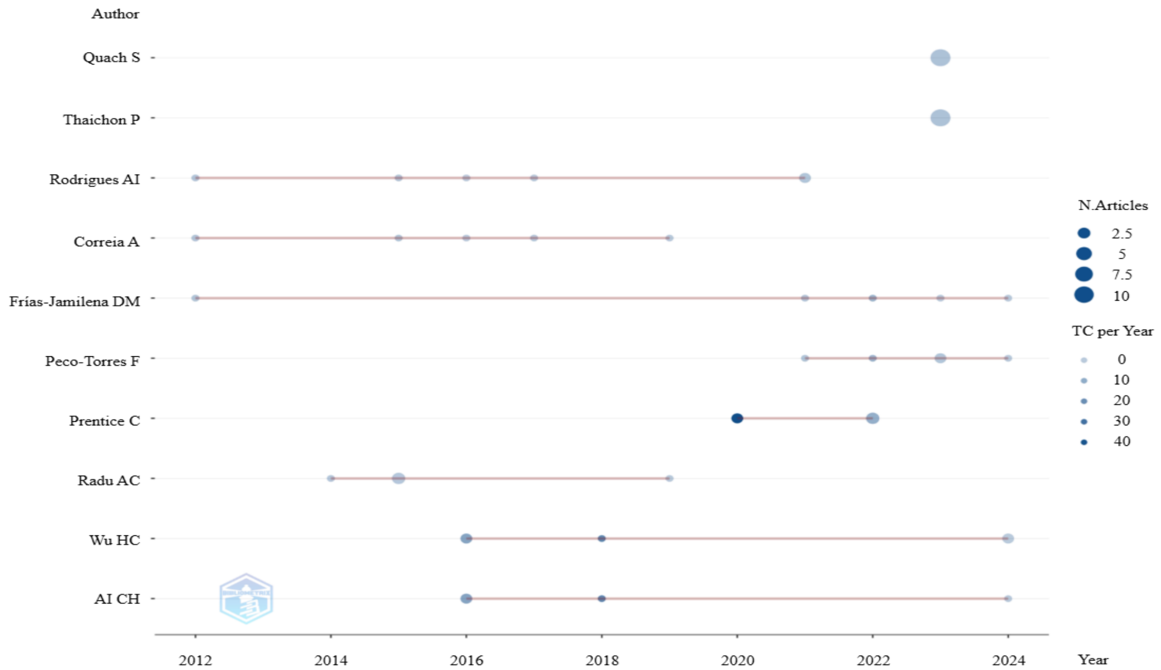

Figure 3. Top authors' productivity over time created using R bibliometrix

Figure 4 ranks the publications' related universities. Griffith University of Australia is the leader with 17 articles, second in the row Hainan University of China. Egyptian EKB is number 3 with 12 and State University of Florida has 11. The rest have less than 10.

Figure 5 a Sankey diagram depicts the flow of authors, countries and research keywords. The diagram shows the most relevant research topics for each country. Most of Australian production is co-authored by Sara Quach and Park Thaichon. Jochen Wirtz, currently dean at National University of Singapore contributed to multiple countries' production. The right side of the figure shows the connection between countries and keywords. Artificial intelligence is certainly the most studied topic in all countries. Tourism was mostly contributed by China.

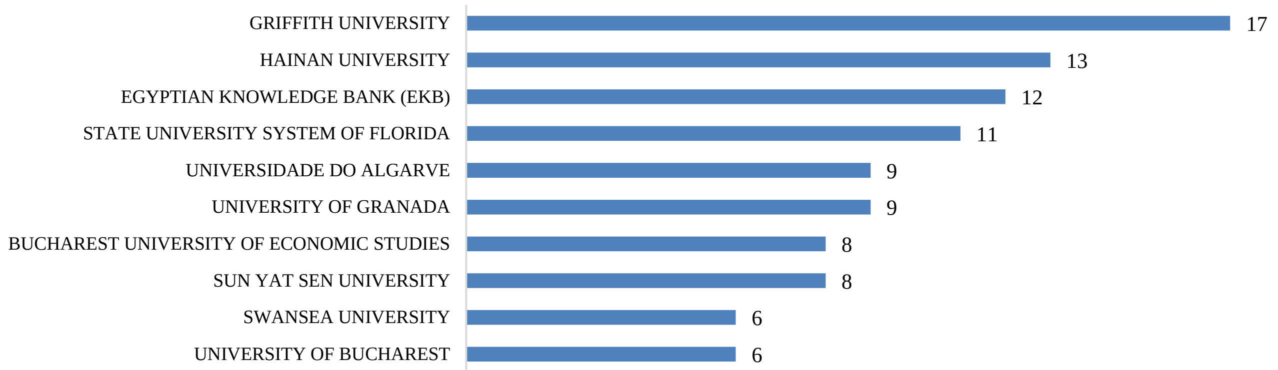

Figure 4. Most Relevant Affiliations created using R bibliometrix and MS Excel

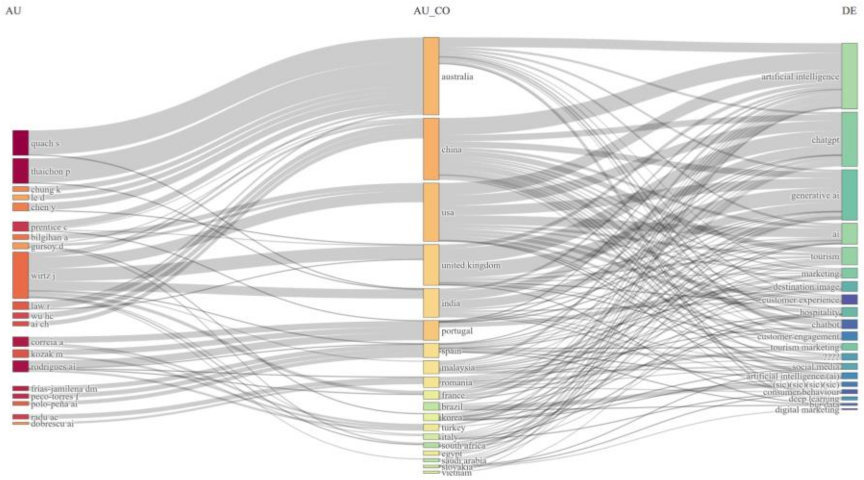

Figure 5. Three-field plot: Authors, their countries and keywords - created using R bibliometrix

In total 1179 keywords were found and 66 had at least 5 occurrences (5,5%). 928 had only 1 occurrence which is 79%. Artificial intelligence and tourism and their related versions had been removed from the network view, because they were part of the search keywords, and their high occurrence is expected. Removing them helps to illustrate the other keywords better (Figure 6.). Their numbers were: Artificial Intelligence (47), tourism (36), AI (21), artificial-intelligence (24) tourism marketing (9) and artificial intelligence (AI) (5). They form 4 clusters, have 603 links and the total link strength is 837.

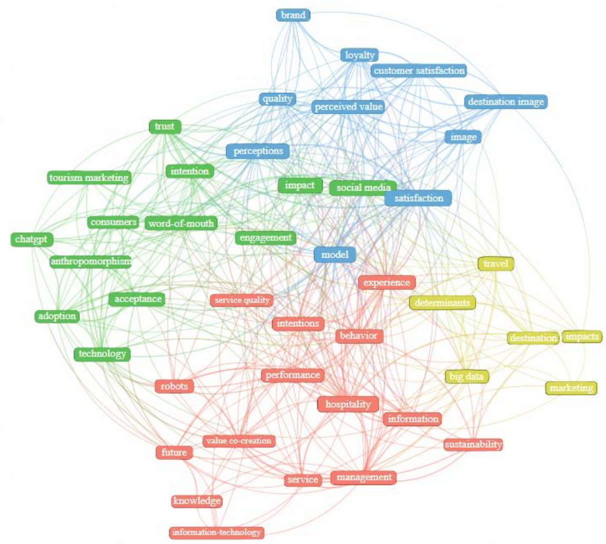

Figure 6. Keywords co-occurrence - created using VOSViewer

Beyond Artificial Intelligence and tourism, the most popular keywords were satisfaction, hospitality, model, impact, perceptions and social media as shown in Table 3.

Table 3. List of keywords with their number of occurrences

Keywords	Occurrence	Keywords	Occurrence
Satisfaction	21	Trust	12
Hospitality	21	Technology	10
Model	18	Behavior	10
Impact	17	Perceived value	9
Perceptions	15	Experience	10
Social media	15	Information	9
Management	12	Acceptance	9

In Figure 7, the countries' number of articles are shown, single or multi country distribution. China is leader, but UK which was mostly cited is only in the middle here which means the less articles were more cited.

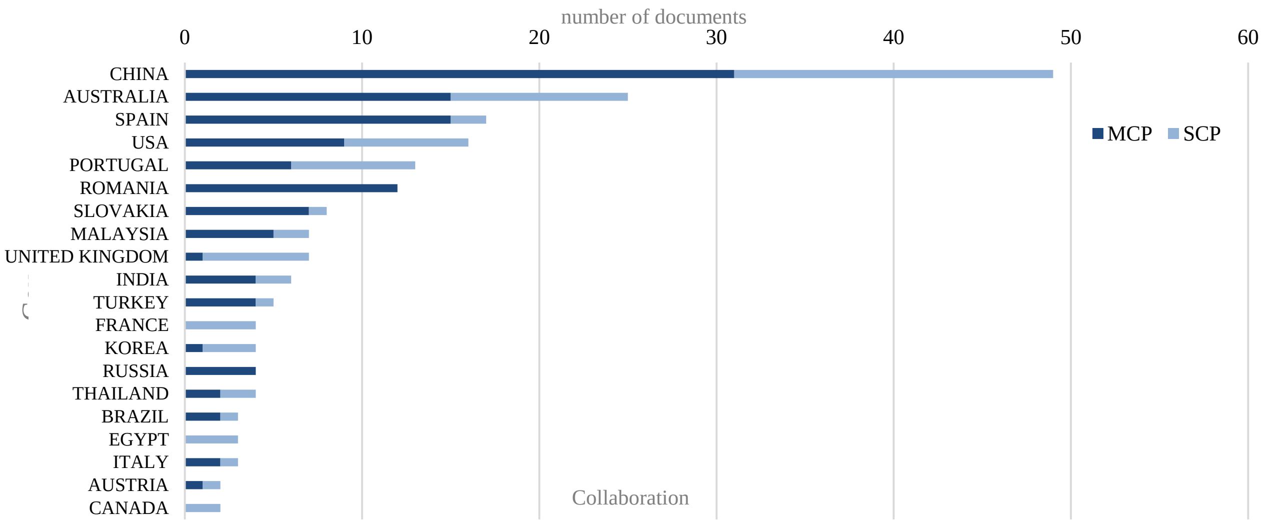

Figure 7. Corresponding author's countries, including single-country (SCP) and multi-country (MCP) publications - created using R bibliometrix

Figure 8 shows a 2 dimensional factor analysis plot, displaying various concepts and their relationships. Dim 1 (x-axis) explains 27.86% of variance and Dim 2 (y-axis) explains 13.29% of the variance. The variance here refers to the variability in the relationships between the keywords or concepts displayed in the figure. This type of analysis is derived from a correspondence analysis, which reduces high-dimensional data into two dimensions for easier visualization. The goal is to capture as much of the original data's structure and relationships as possible in these two dimensions.

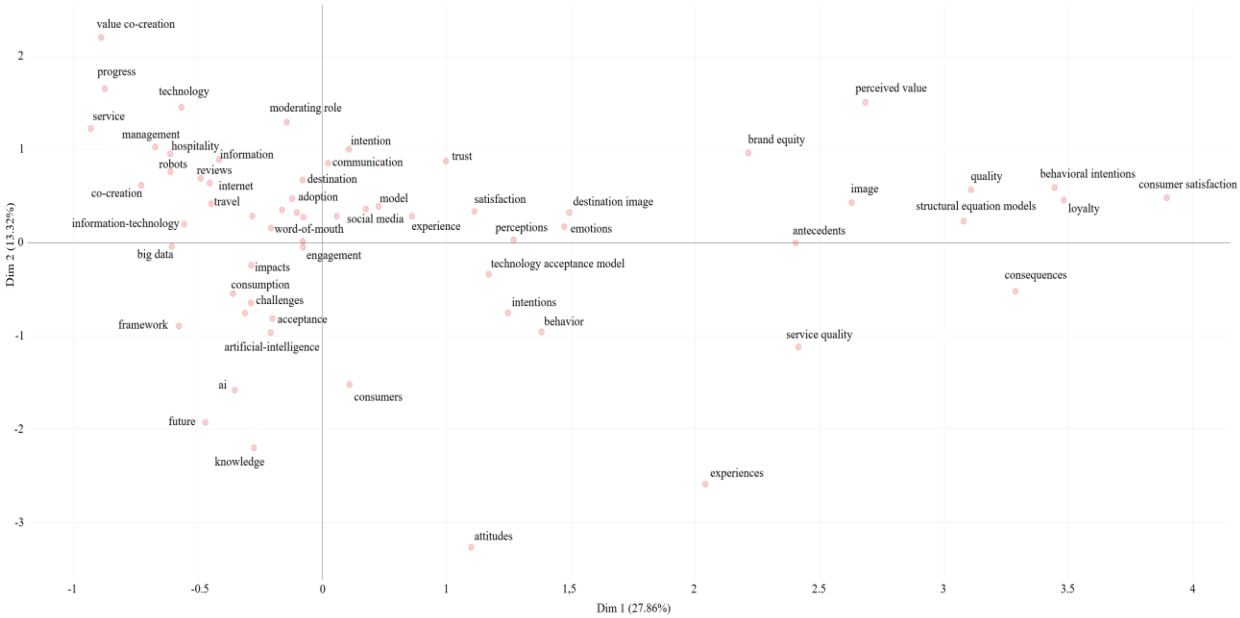

Figure 8. Factorial analysis created using R bibliometrix

The variance reflects how well these two dimensions summarize the co-occurrence patterns or thematic relationships among the keywords extracted from the research corpus. Technology and Service cluster is located in the upper left quadrant containing terms like “value co-creation”, “service”, “technology” and “robots”. Consumer behavior cluster centered in the middle of the plot includers terms like “trust”, “behavior”, “technology acceptance model”. On the Customer Experience cluster, which is located on the right features terms like “loyalty”, “customer satisfaction”, “quality”, and “perceived value”. Finally, AI and Future Technologies located in the lower left, contains “AI”, “Artificial intelligence”, “knowledge” and “big data”. The proximity of the terms suggests thematic relationships, the ones closer to each other being more related. The visualization effectively maps out the intellectual structure of what appears to be research in technology acceptance, service quality and customer experience domains.

The thematic map on Figure 9. provides additional strategic insights when analyzed alongside the factor analysis, revealing a comprehensive research landscape. The visualization is divided into four quadrants: relevance degree (x-axis, centrality) and development degree (y-axis, density). The ‘motor themes’ (upper-right) represents mature and central research topics: customer satisfaction, loyalty, tourism models, and hospitality management.

It shows a strong connection between consumer experiences, attitudes, and behaviors. ‘Basic themes’ (lower-right) contains fundamental, but not-yet fully developed concepts, like food, consumption and photography themes. ‘Niche themes’ (upper-left) shows specialized topics with high development, but lower centrality containing economic growths and United States related themes. ‘Emerging/declining themes’ (lower left) represent potential future research directions including entrepreneurship, work motivation, and self-determination theory.

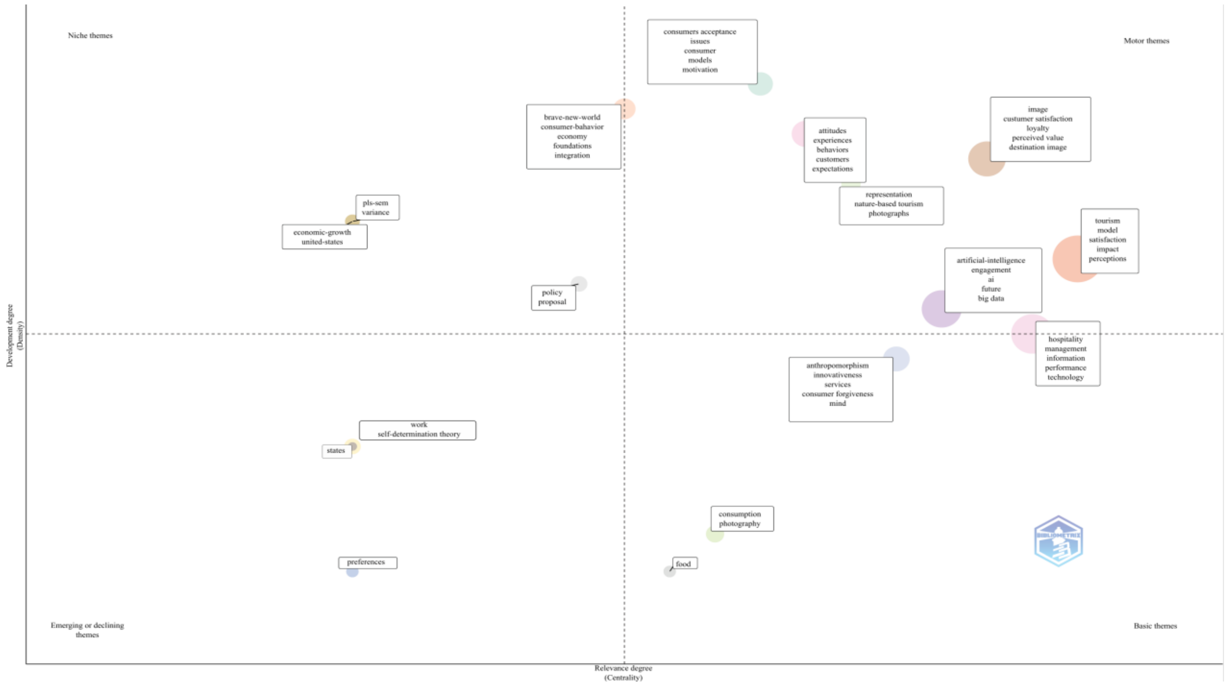

Figure 9. Thematic Map created using R bibliometrix

When comparing both visualizations they confirm the central role of customer satisfaction and loyalty in the research field. Consumer behavior and experiences are consistently shown as core research areas. Technology and AI-related concepts appear as emerging or transformative elements. Motor themes align with the right-side clusters in the factor analysis, confirming their established nature. Emerging themes in the lower-left quadrant correspond to the technology and AI clusters in the factor analysis, suggesting future directions.

RESULTS AND DISCUSSION

Findings of top cited papers

The mostly cited study provides a comprehensive overview of the opportunities, challenges, and implications of generative AI technologies like ChatGPT across various domains including education, business, and society (Dwivedi et al., 2023). Opportunities and potential benefits include Enhanced productivity and efficiency in tasks like content creation, coding, and information retrieval, improved business activities in areas like management and marketing, Augmentation of human intelligence and creativity. Concerns consists of potential for biases, misinformation, and misuse, disruption to existing practices in education and other fields, difficulty in differentiating AI-generated from human-generated content, threats to privacy and security, ethical and legal issues around authorship, plagiarism, and intellectual property. The paper concludes that while generative AI like ChatGPT offers significant opportunities, it also presents complex challenges that require further research and careful consideration as the technology continues to evolve and be adopted more widely (Dwivedi et al., 2023).

Customers' willingness and objection to using AI robotic devices in hospitality services (Lin et al., 2019) builds upon and extends the Artificially Intelligent Device Use Acceptance (AIDUA) theory. The study validates and extends the

AIDUA framework in the hospitality service setting, demonstrating its applicability in explaining customers' acceptance of AI robotic devices. Customers' intention to use AI devices is influenced by social influence, hedonic motivation, anthropomorphism, performance and effort expectancy, and emotions toward the devices. Full-service hotel customers rely less on social groups when evaluating AI robotic devices compared to limited-service hotel customers. Full-service hotel customers' emotions have less impact on their objection to AI device use.

The study found a direct relationship between customers' hedonic motivation and their positive emotions toward AI service devices, with hedonic motivation being the most critical factor encouraging AI robotic service use. The study found a direct relationship between customers' hedonic motivation and their positive emotions toward AI service devices, with hedonic motivation being the most critical factor encouraging AI robotic service use. The study concludes that customers' AI device acceptance behavior is context-dependent and suggests the need for further research as AI technology rapidly develops. Cruise tourists in Hong Kong were examined (Wu et al., 2018), focusing on experimental quality, value, satisfaction and behavioral intentions. Survey data was collected from 677 tourists.

Outcome quality and interaction quality were the most important dimensions of experiential quality. Functional value positively influenced experiential satisfaction. Experiential quality and satisfaction positively influenced trust. Trust, corporate reputation and experiential satisfaction positively influenced behavioral intentions. The study contributes to understanding how cruise tourists evaluate their experiences and what factors influence their satisfaction and future behaviors. This can help cruise companies improve their offerings and marketing approaches (Wu et al., 2018). Mispresenting quality might significantly damage trust (Hassan et al., 2024).

Systematic research on AI use in service delivery focusing on the hospitality industry summarizes 63 publications (Chi et al., 2020). AI applications in the service industry are still transitioning from basic automation to more advanced analytical capabilities. The hospitality sector is seeing increased use of AI for tasks like check-in, concierge services, and room service. Research shows mixed impacts of AI anthropomorphism on customer attitudes. Factors like the AI's behavior, functionality, and the service context influence customer acceptance. The paper discusses several frameworks for understanding AI acceptance, including the Artificially Intelligent Device Use Acceptance (AIDUA) theory. Key drivers include cost savings, addressing labor shortages, and enhancing service quality. However, there are challenges around customer and employee acceptance (Chi et al., 2020). Overall, the review highlights that AI adoption in hospitality services is still in the early stages, with significant potential for transformation but also important challenges to address.

AI’s impact on loyalty was examined in Portugal (Prentice 2020a) in multiple hotels focusing on departing guests who had experienced both AI and employee services. The AI services had five dimensions: concierge robots, digital assistance, voice-activated services, travel experience enhancers, and automatic data processing. When analyzed together, AI service quality showed a negative effect on overall service quality assessment, while employee service quality (mostly empathy) made a substantially significant contribution (Prentice, 2020a). The study concludes that while AI services are important, customers still prefer and value human interaction in the hotel industry. It suggests that hotels should balance AI implementation with maintaining high-quality employee services to enhance customer satisfaction and loyalty (Prentice, 2020a).

ChatGPT’s potential impact on consumer behavior and marketing was examined by J. Paul (Paul et al., 2023). Some of the benefits include improved customer experience, cost-effectiveness, improved marketing campaigns, potential pitfalls around misinformation, inaccuracies, privacy- and security concerns, and ethical considerations. The paper emphasizes the need for interdisciplinary research involving marketing scientists, statisticians, psychologists, economists, sociologists, and natural science researchers to fully explore the potential of ChatGPT in consumer studies and marketing.

The relationship between AI quality performance and customer engagement in the hotel industry was studied through affordance theory, positioning AI as a commercial service in the hotel context (Prentice et al., 2020b). AI service indicators significantly influence customers’ perceptions of AI information quality and system quality. AI satisfaction (both information and system) is positively and significantly related to customer engagement. Ai preference has a significant moderation effect on the relationship between AI information quality and satisfaction, suggesting customers perceive AI primarily as an information generation tool. The study contributes to AI research by extending it into marketing and customer relationship management. (Prentice et al., 2020b) It introduces a new measure of service quality by including AI-empowered services in quality assessments. Impact of AI and robotics in the tourism sector was explored by (Samala et al., 2020). Their findings were mostly around chatbots, translations, virtual reality, simplifying travel arrangements, personalized experiences, leading to improved customer satisfaction, while saving costs for the businesses.

Augmented reality and virtual experiences can help provide a preview of the destinations. Challenges and concerns include potential reduction in human jobs and interactions, privacy and data security issues, technological limitations and malfunctions (Samala et al., 2020). Their final conclusion is that AI is expected to transform various aspects of travel planning and post-trip engagement, its implementation needs to be carefully managed to address concerns and maximize benefits for both businesses and travelers. Can machines think? Question posed by Alan Turing 70 years ago. (Grundner & Neuhofer, 2020) explore the potential impact of AI on tourist destination experiences in the year of 2025 using a futures wheel method. Their study aims to understand how AI might create or destroy value in tourism contexts.

The model outlines four main areas of AI impact, examining both positive (value co-creation) and negative outcomes (value co-destruction): (1) Interaction and co-creation, (2) Information, (3) Personalization and (4) Integration. AI can potentially understand human needs and emotions, leading to personalized experiences, however there are concerns about reduced human interactions and over-dependency on AI. While providing real-time, contextual information, there’s a risk of information overload and distraction from authentic experiences. AI can tailor experiences and increase efficiency but might lead to unrealistic expectations. Finally, AI might seamlessly integrate with other technologies like VR, it could potentially diminish the authenticity of destinations. The study suggests that tourism businesses and destinations need to find a balance in AI implementation to enhance experiences without compromising authenticity. It also highlights the need for further research on AI's impact across different stages of the tourist experience.

Future research agenda

There is a need for further research involving marketing scientists, statisticians, psychologists, economists, sociologists, and natural science researchers to fully explore the potential of AI in consumer studies and tourism marketing. Further investigation is required on how AI affects different phases of the tourist experience, from pre-trip planning to post-trip engagement. Research should focus on finding the optimal balance between AI-powered services and human touch in the hospitality industry. Studies are needed to address the ethical considerations, privacy concerns, and legal challenges associated with AI use in tourism marketing. More research is required to understand factors influencing customer acceptance and trust in AI-powered tourism services. Longitudinal studies should examine the long-term impact of AI adoption on customer satisfaction, loyalty, and overall tourism industry performance.

CONCLUSION

The integration of AI in tourism marketing presents both significant opportunities and challenges. While AI has the potential to enhance productivity, personalization, and customer experiences, it also raises concerns about privacy, authenticity, and the potential loss of human touch in tourism services. Key findings suggest that AI can significantly improve efficiency and personalization in tourism marketing and services. However, customers still value human interaction, especially in high-touch hospitality settings. Therefore, implementation of AI in tourism needs to be carefully managed to maximize benefits while addressing potential drawbacks. AI is expected to transform various aspects of travel planning and experiences, but its adoption should be balanced with maintaining authenticity and meaningful human connections. As AI technology continues to evolve rapidly, the tourism industry must adapt strategically, focusing on leveraging AI to enhance rather than replace human-centric experiences.

The future of AI in tourism marketing lies in finding the right balance between technological innovations and preserving the essence of hospitality and authentic travel experiences. The accelerating pace of evolution exceeds all previous estimations according to Prof Geffrey Hinton who was awarded Nobel Prize in physics for his work on AI (Guardian, 2024). OpenAI’s O3 released in December 2024 - might be a step closer to AGI (artificial general intelligence) - is currently under testing at the moment but seems to be doing better on benchmarks which require human-line problem solving approach. These urge the continuation of the research in AI not only in tourism marketing but all fields of its application.

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

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgements: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Adams, J. (2024). AI Foundations of Large Language Models: Easy To Read Guide Introducing the Foundations Of Large Language Models 'LLMs' and AI. (n.d.). (n.p.): *Green Mountain Computing*.

Arora, J. K. (2024). *Large Language Models* - LLMs. (n.p.): Jagdish Krishanlal Arora. ISBN: 9798224994915

Bawden, D., & Robinson, L. (2020). Information overload: An Introduction. *Oxford Research Encyclopedias*. https://doi.org/10.1093/acrefore/9780190228637.013.1360

Bevilacqua, M., Oketch K., Qin, R., Stamey, W., Zhang, X., Gan, Y., Kai Yang, K., & Abbasi, A. (2025). When Automated Assessment Meets Automated Content Generation: Examining Text Quality in the Era of GPTs. *ACM Trans. Inf. Syst.* 43, 2, 36. https://doi.org/10.1145/3702639

Bonifacio, L., Abonizio, H., Fadaee, M., & Nogueira, R. (2022). *InPars: Data augmentation for information retrieval using large language models*. https://doi.org/10.48550/arXiv.2202.05144

Cao, Y., Li, S., Liu, Y., Yan, Z., Dai, Y., Yu, P. S., & Sun, L. (2023). *A comprehensive survey of AI-generated content (AIGC): A history of generative AI from GAN to ChatGPT*. https://doi.org/10.48550/arXiv.2303.04226

Cardona-Acevedo, S., Agudelo-Ceballos, E., Arango-Botero, D., Valencia_Arias, A., La Cruz, R. D. J., Jimenez Garcia, J. A., Goycochea, C., F., Rojas, E.M. *Applications of Machine Learning (ML) in the context of marketing: a bibliometric approach* [version 1; peer review: 1 approved with reservations]. *F1000 Research 2025*, 14:92. https://doi.org/10.12688/f1000research.160010.1

Chi, O. H., Denton, G., & Gursoy, D. (2020). Artificially intelligent device use in service delivery: a systematic review, synthesis, and research agenda. *Journal of Hospitality Marketing & Management*, 29(4), 1-30. https://doi.org/10.1080/19368623.2020.1721394

Dairo, A. O., & Szűcs, K. (2025). Adaptive learning engine for driving marketing channel performance: a machine learning approach. *Journal of Research in Interactive Marketing*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/JRIM-02-2024-0098

Devlin, J., Chang, M. W., Lee, K., & Toutanova, K. (2019). Bert: Pre-training of deep bidirectional transformers for language understanding. *The Conference of the North American Chapter of the Association for Computational Linguistics. Association for Computational Linguistics.* https://doi.org/10.48550/arXiv.1810.04805

Ding, S., Tian, Y., Xu, F., Li, Q., & Zhong, S. (2019). Trojan attack on deep generative models in autonomous driving. *Security and Privacy in Communication Network*. https://doi.org/10.1007/978-3-030-37228-6_15

Dai, P., Dai, X., Ma, Y., Du, C., Wang, J., & Fan, W. (2024). Exploring the Key Factors Affecting the Growth of ChatGPT Users. IEEE 7th Information Technology, Networking, Electronic and Automation Control Conference (ITNEC), Chongqing, China, 1529-1532. https://doi.org/10.1109/ITNEC60942.2024.10733139

Dwivedi, Y. K., Kshetri N., Hughes L., Slade, E. L., Jeyaraj, A., Kar, A. K., Baabdullah, A.M., Koohang, A., Raghavan, V., Ahuja, M., Albanna, H., Albashrawi, M. A., Al-Busaidi, A. S., Balakrishnan, J., Barlette, Y., Basu, S., Bose, I., Brooks, L., Buhalis, D., Carter, L., Chowdhury, S., Crick, T., Cunningham, S. W., Davies, G. H., Davison, R. M., De, R., Dennehy, D., Duan, Y., Dubey, R., Dwivedi, R., Edwards, J. S., Flavian, C., Gauld, R., Grover, V., Hu, M.C., Janssen, M., Jones, P., Junglas, I.,Khorana, S., Larsen, S. K., Latreille, P., Laumer, S., Malik, F. T., Mardani, A., Mariani, M., Mithas, S., Mogaji, E., Nord, J. H., O'Connor, S., Okumus, F., Pagani, M., Pandey, N., Papagiannidis, S., Pappas, I.O., Pathak, N., Pries-Heje, J., Raman, R., Rana, N. P., Rehm, S.-V., Ribeiro-Navarrete, S., Richter, A., Rowe, F., Sarker, S., Stahl, B. C., Tiwari M. K., van der Aalst, W., Venkatesh, V., Viglia G., Wade, M., Walton, P., Wirtz, J., Wright, R. (2023). Opinion Paper: "So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. *International Journal of Information Management* 71. https://doi.org/10.1016/j.ijinfomgt.2023.102642

El Youbi, R., Messaoudi, F., & Loukili, M. (2025). Convolutional Neural Networks for Advanced Sales Forecasting in Dynamic Market Environments. *Statistics, Optimization & Information Computing*. https://doi.org/10.19139/soic-2310-5070-2143

Eulerich, M., Sanatizadeh, A., Vakilzadeh, H., & Wood, D. A. (2024). Is it all hype? ChatGPT's performance and disruptive potential in the accounting and auditing industries. *Rev Account Stud.*, 29, 2318–2349. https://doi.org/10.1007/s11142-024-09833-9

Ezeh, P. C., & Dube, K. (2025). Bibliometric analysis of trends and development in religion and green tourism behavior. *Cogent Social Sciences*, 11(1). https://doi.org/10.1080/23311886.2024.2445771

Fallah, M., Karami, T., & Kojouri, K. M. (2023). The art of human participation against artificial intelligence with geospatial information system in the tourism industry. *GeoJournal of Tourism and Geosites*, 49(3), 919–933. https://doi.org/10.30892/gtg.49309-1093

Forbes (2024). *Digital Marketing In 2024: The Ultimate Guide.* Accessed 21.03.2024. https://www.forbes.com/advisor/in/business/digital-marketing/

Fry, H. (2018). Hello World. How to be human in the age of the machine. Transworld, Version 1.0 Epub ISBN 9781473544710.

Geary, D. C. (2021). Mitochondrial functioning and the relations among health, cognition, and aging: where cell biology meets cognitive science. *International Journal of Molecular Sciences*, 22 (7), 3562. https://doi.org/10.3390/ijms22073562

Goodfellow, I., Pouget-Abadie, J., Mirza, M., Xu, B., Warde-Farley, D., Ozair, S., Courville, A., & Bengio, Y. (2020). Generative adversarial networks. Communications of the ACM, 63(11), 139-144. https://doi.org/10.1145/3422622

Google Search Central (2008). Demystifying the "duplicate content penalty". https://developers.google.com/search/blog/2008/09/demystifying-duplicate-content-penalty, downloaded: 02.03.2025

Google Search Central (2023). Google Search's guidance about AI-generated content. https://developers.google.com/search/blog/2023/02/google-search-and-ai-content, downloaded: 02.03.2025

Grundner, L., & Neuhofer, B. (2020). The bright and dark sides of artificial intelligence: A futures perspective on tourist destination experiences. *Journal of Destination Marketing & Management* 19(1). https://doi.org/10.1016/j.jdmm.2020.100511

Guardian, (2024). Godfather of AI' shortens odds of the technology wiping out humanity over next 30 years. https://www.theguardian.com/technology/2024/dec/27/godfather-of-ai-raises-odds-of-the-technology-wiping-out-humanity-over-next-30-years, downloaded on: 02.03.2025

Haleem, A., Javaid, M., & Singh, R. P. (2023). An era of ChatGPT as a significant futuristic support tool: a study on features, abilities, and challenges, Bench Council Transactions on Benchmarks Standards and Evaluations 2(1). https://doi.org/10.1016/j.tbench.2023.100089

Hassan, T. H., Ammar, S., Abdelhay, H. F., Fayyad, S., Noreldeen, M. A., Salem, A. E., Gayed Abdel, A. H., Janzakov, B., Mahmoud, M. H., & Al-Azab, M. R. (2024). The impact of deceptive hospitality and tourism marketing tactics on tourists' social media interactions and trust and destination image in emerging markets. *Geojournal of Tourism and Geosites*, 56(4), 1732–1743. https://doi.org/10.30892/gtg.56428-1342

Ippolito, D., Yuan, A., Coenen, A., & Burnam, S. (2022). Creative Writing with an AI-Powered Writing Assistant: Perspectives from Professional Writers. https://doi.org/10.48550/arXiv.2211.05030

Ivancsóné Horváth, Zs., Raffay, Z., & Happ, É. (2025). Digitalisation in angling tourism: introducing new technologies to a traditional tourism product. *Geojournal of Tourism and Geosites*, 58(1), 42–51. https://doi.org/10.30892/gtg.58104-1389

Kong, L., Liu, Z., Zhang, K., Kong, D., & Yan, W. (2023). Discussion on AI Influence from the Perspective of Chat GPT. In: Long, S., Dhillon, B. S. (eds) Man-Machine-Environment System Engineering. MMESE 2023. Lecture Notes in Electrical Engineering, 1069, Springer, Singapore. https://doi.org/10.1007/978-981-99-4882-6_97

Lin, H., Chi, O. H., & Gursoy, D. (2019). Antecedents of customers' acceptance of artificially intelligent robotic device use in hospitality services. *Journal of Hospitality Marketing & Management* 29(28), 1-20. https://doi.org/10.1080/19368623.2020.1685053

Melumad, S., Meyer, R., (2020). Full Disclosure: How Smartphones EnhanceConsumer Self-Disclosure. *Journal of Marketing*, 84(3) 28-45. https://doi.org/10.1177/0022242920912732

Menon, D., & Shilpa, K. (2023). "Chatting with ChatGPT": Analyzing the factors influencing users' intention to Use the Open AI's ChatGPT using the UTAUT model. *Helyon*, 9(11). https://doi.org/10.1016/j.heliyon.2023.e20962

Michelet, G., & Breitinger, F. (2024). ChatGPT, Llama, can you write my report? An experiment on assisted digital forensics reports written using (local) large language models, *Forensic Science International: Digital Investigation*, 48, Supplement, 301683, ISSN 2666-2817. https://doi.org/10.1016/j.fsidi.2023.301683.

Naimi, L., Manaouch, M., & Jakimi, A. (2024). Leveraging machine learning algorithms to identify potential geosites for geotourism promotion in ziz upper watershed in southeastern Morocco. *Geojournal of Tourism and Geosites*, 57(4spl), 2041–2051. https://doi.org/10.30892/gtg.574spl18-1371

Nalbant, K. G., & Aydin, S. (2025). A bibliometric approach to the evolution of artificial intelligence in digital marketing, *International Marketing Review*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/IMR-04-2024-0132

Paul, J., Ueno, A., & Dennis, C. (2023). ChatGPT and consumers: Benefits, Pitfalls and Future Research Agenda. *International Journal of Consumer Studies*, 47(5), 1-13. https://doi.org/10.1111/ijcs.12928

Prentice, C., Lopes, S. D., & Wang, X., (2020a). The impact of artificial intelligence and employee service quality on customer satisfaction and loyalty. *Journal of Hospitality Marketing & Management* 29(2). https://doi.org/10.1080/19368623.2020.1722304

Prentice, C., Weaven, S., & Wong, I. A. (2020b). Linking AI quality performance and customer engagement: The moderating effect of AI preference. *International Journal of Hospitality Management* 90 102629. https://doi.org/10.1016/j.ijhm.2020.102629

Prerana, Kapoor, D., & Jain, A. (2024). Sustainable tourism and its future research directions: a bibliometric analysis of twenty-five years of research. *Tourism Review*, 79(3), 541-567. https://doi.org/10.1108/TR-11-2022-0540

Saavedra-Azabache, L. M., Vilchez-Linares, G. J., & Cieza-Mostacero, S. E. (2024). Inbound marketing and customer loyalty in the tourism sector. *Innovative Marketing*, 20(1). https://doi.org/10.21511/im.20(1).2024.20

Samala, N., Katkam, B. S., Bellamkonda, R. S., & Rodriguez, R. V. (2020). Impact of AI and robotics in the tourism sector: a critical insight. *Journal of Tourism Futures*, 8(1), 73-87. https://doi.org/10.1108/JTF-07-2019-006

Sharma, D., Shukla, R., Giri, A. K., & Kumar, S. (2019). A brief review on search engine optimization," in 9th International Conference on Cloud Computing, *Data Science & Engineering*. IEEE. https://doi.org/10.1109/CONFLUENCE.2019.8776976

See, A., Liu, P. J., & Manning, C. D. (2017). Get to the point: Summarization with pointer-generator networks. Proceedings of the 55th Annual Meeting of the Association for Computational Linguistics (1). https://doi.org/10.18653/v1/P17-1099

Skaar, S. A., Comprehensive Guide to Neural Network Modeling. (2020). United States: Nova Science Publishers. ISBN: 9781536185423

Sutherland, T., & Wark, S. (2024). (Re)search results: search engines and the logic of efficiency in scholarship distinktion-journal of social theory. *Journal of Social Theor.* ttps://doi.org/10.1080/1600910X.2024.2352043

The Artificial Intelligence Act: The EU Artificial Intelligence Act; Up-to-date developments and analyses of the EU AI Act.

Thakur, J., & Kushwaha, B. P. (2024). Artificial intelligence in marketing research and future research directions: Science mapping and research clustering using bibliometric analysis. *Global Business and Organizational Excellence*, 43, 139–155. https://doi.org/10.1002/joe.22233

Tian, Z., Cui, L., Liang, J., & Yu, S. (2022). A comprehensive survey on poisoning attacks and countermeasures in machine learning. *ACM Computing Surveys*, 55(8), 1–35. https://doi.org/10.1145/3551636

Tomczak, J. M. (2022). *Deep Generative Modeling*. Switzerland: Springer International Publishing. ISBN: 9783030931582

Vayadande, K., & Baviskar, A. J., Avhad Bahadkar, S., Bhalerao, P., & Chimkar, A. (2024). A Comprehensive Review on Navigating the Web 3.0 Landscape. Second International Conference on Inventive Computing and Informatics (ICICI), Bangalore, India, 456-463. https://doi.org/10.1109/ICICI62254.2024.00080

Vu, T. T. H., Hoang, H. H., Hoang, T. N. N., & Nguyen, X. L. (2025). Bibliometric and content analysis of global trends in digital transformation and rural tourism. *Geojournal of Tourism and Geosites*, 58(1), 161–175. https://doi.org/10.30892/gtg.58114-1399

Wang, Y., Pan, Y., Yan, M., Su, Z., & Luan, T. H. (2023). A Survey on ChatGPT: AI-Generated Contents, Challenges, and Solutions. *IEEE Open Journal of the Computer Society* (4), 2644-1268. https://doi.org/10.1109/OJCS.2023.3300321

Wu, H. C., Cheng, C. C., & Ai, C. H. (2018). A study of experiential quality, experiential value, trust, corporate reputation, experiential satisfaction and behavioral intentions for cruise tourists: The case of Hong Kong. *Tourism Management*, 66, 200-220. https://doi.org/10.1016/j.tourman.2017.12.011

Wu, T. Y., He, S. Z., Liu, J. P., Sun, S. K., Liu, K., Han, Q. L., & Tang, Y. (2023). A brief overview of ChatGPT: The history, status quo and potential future development. *IEEE/CAA Journal of Automatica Sinica*, 10(5), 1122–1136. https://doi.org/10.1109/JAS.2023.123618

Zhang, Y., & Liu, J. (2025). B2B marketing recommendation system based on improved genetic algorithm model. *Journal of Business Analytics*, 1–12. https://doi.org/10.1080/2573234X.2025.2458331

Ziakis, C., Vlachopolou, M., Kyrkoudis, T., Karagkiozidou, M. (2019). Important Factors for Improving Google Search Rank. *Future Internet*, MDPI, 11(2), 1-12. https://doi.org/10.3390/fi11020032

Article history: Received: 16.01.2025 Revised: 12.05.2025 Accepted: 04.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1158-1167
DOI 10.30892/gtg.602spl13-1489

THE EFFECT OF EARTHQUAKE ON THE TOURISM SECTOR: CASE OF TURKIYE 1999 AND 2023

Vasif ALIYEV [1*]

[1]Azerbaijan State University of Economics (UNEC), Turkic World of Economics Faculty, Azerbaijan Khazar University, Azerbaijan, Western Caspian University, Baku, Azerbaijan, vasif.aliyev@unec.edu.az (V.A.)

Citation: Aliyev, V. (2025). The effect of earthquake on the tourism sector: Case of Turkiye 1999 and 2023. *Geojournal of Tourism and Geosites*, 60(2spl), 1158–1167. https://doi.org/10.30892/gtg.602spl13-1489

Abstract: Perceptions of tourism risk and decision-making processes are influenced by various factors, including security concerns, socioeconomic and demographic characteristics such as age, gender, education, religion, income, tourism motivation, and personal experiences. The effect of disaster events on tourism is shaped by the events' magnitude, frequency, and the destination's ability to adapt and recover. This study investigates how the 1999 Marmara and 2023 Kahramanmaraş earthquakes influenced Türkiye's tourism sector, using a qualitative methodology supported by secondary data. Tourism statistics from the 1999 Marmara earthquake show a sharp decline in international tourist arrivals—from 9,752,697 in 1998 to 7,487,285 in 1999. Tourism revenues also dropped significantly, with estimated losses reaching $3 million due to canceled tours. A 25% decline in tourism was noted specifically during August and September 1999. In contrast, the 2023 earthquake did not result in a significant reduction in tourism activity. One reason for the stability in 2023 is that the earthquake-affected regions—such as Kahramanmaraş, Hatay, Adıyaman, Malatya, Gaziantep, and others—are geographically distant from major tourist destinations like Antalya, Bodrum, and Muğla. However, public perception plays a critical role. If tourists are unaware that their intended destinations are unaffected, it could lead to declines regardless of safety. To enhance recovery and build resilience, several strategies are proposed. First, rebuilding critical infrastructure—roads, bridges, and public spaces—is essential. Second, social media should be used effectively to promote unaffected tourist destinations. Targeted campaigns should highlight attractions based on specific tourist interests, such as family travel, adventure, or gastronomy. Collaborations with platforms like Booking.com, TripAdvisor, and Expedia can further ease travel planning. Moreover, media engagement is vital. Positive coverage can help reshape the destination image. Journalists and bloggers should be provided with accurate, timely information about recovery efforts and safe areas. Despite effective recovery from the 2023 event, challenges remain in establishing clear causal relationships between crises and structural changes in tourism flows. Structural break analysis, while helpful, is limited by time-specific data and cannot fully isolate tourism behavior triggers.

Keywords: earthquake, natural disasters, environmental crisis, tourism infrastructure, sustainable tourism, disaster resilience

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INTRODUCTION

Tourism refers to the actions of individuals who travel to and stay in places outside their usual environment for a period of up to one year without interruption, mainly for leisure, business, and other purposes (WTO, 1999). Türkiye, situated in a geologically active area, has a lengthy record of seismic activity. Undoubtedly, Türkiye is situated in a geologically active area where the Eurasian and African tectonic plates converge, rendering it susceptible to earthquakes. Consequently, approximately 66% of Türkiye's land is occupied by active faults, exposing over 70% of the population to a significant danger of earthquake-related harm and devastation (Ewing et al., 2004).

Natural disasters can exert a substantial impact on different sectors of the economy, including the tourism industry. Türkiye is renowned as a sought-after tourist hotspot, celebrated for its abundant cultural legacy, breathtaking natural scenery, and picturesque coastlines. Nevertheless, earthquakes have the potential to inflict substantial harm upon these attractions, resulting in a decrease in tourism. The objective of this study is to ascertain the impact of the 2023 earthquake in Türkiye on both the economy and the influx of international tourists. Turkiye is a country with a high level of structural regime shifts in the economy (Guliyev, 2022). This study seeks to employ an innovative methodology to comprehend the impact of a natural calamity on tourist movement. The research seeks to analyze the impact of the earthquake on the tourism industry in order to gain insights into effective strategies for mitigating the damage and recovering from its effects. The subsequent sections of this paper are organized as follows: Section 1 offers an overview of earthquakes and their connection to the tourism sector. Section 2 provides a detailed explanation of the methodology and data sources employed in this study. The main discoveries are outlined in Section 3, subsequently followed by an analysis of the outcomes in Section 4. In Section 5, we ultimately conclude the paper by providing a concise overview of our research findings and presenting our policy recommendations. According to the results, we offer recommendations for possible approaches to reduce the impact of the earthquake on the tourism sector in Turkiye. These suggestions can be valuable for policymakers, tourism operators, and other stakeholders in the industry to devise effective strategies to mitigate the impact and facilitate the recovery of the tourism sector following the earthquake.

[*] Corresponding author

LITERATURE REVIEW

Faisal et al.' s review would likely concentrate on prior studies concerning the impact of natural disasters on the tourism and hospitality sectors, as well as research on the application of niche construction theory in the field of economic geography. The review would also encompass pertinent policy and planning documents concerning post-disaster reconstruction endeavors in Christchurch (Faisal et al., 2020). The paper by Zhang and Cheng investigates the correlation between the progress of tourism and the economic advancement in the 36 counties in China that were impacted by the Wenchuan earthquake. The study covers the period from 2008 to 2016. The authors employ a panel threshold regression methodology to examine the impact of tourism development on economic growth, while also categorizing the counties into distinct groups (Zhang & Cheng, 2019). The research conducted by Huang et al. examines the prolonged recovery of inbound tourism in areas affected by disasters, specifically focusing on the Wenchuan earthquake in Sichuan as an illustrative example. The results demonstrate the existence of a phenomenon known as the "Blessing in Disguise" effect, which has led to a notable rise in the number of tourists visiting Sichuan following the earthquake. The study also emphasizes that this effect is a distinctive phenomenon, separate from the general pattern of inbound tourism in China during the same timeframe. This research enhances the overall comprehension of post-disaster tourism recovery. Moreover, the study offers valuable insights into tourism destinations that emerge after a disaster, and it discusses the practical consequences of the research for management (Huang et al., 2020).

The study conducted by Min et al., 2020 employed the ARIMA model to assess the magnitude of macroeconomic recuperation in Nepal's tourism sector subsequent to a natural calamity, specifically the earthquakes in 2015. The study examined time series data spanning from 1990 to 2018 in order to explore the impact of earthquakes on both tourism inflows and GDP. The findings indicate a shift in the pattern of rising tourist figures during the period following the earthquake. One possible explanation for this increase is the emergence of dark tourism, which refers to the practice of visiting locations linked to death, tragedy, or catastrophe. This study focuses on assessing the macroeconomic recovery of a heritage tourist destination following a natural disaster. It also aims to fill the gap in existing literature by examining the relationship between purpose-based tourism demand, dark tourism, and disaster recovery in a heritage tourism destination (Min et al., 2020).

Ural (2015) emphasizes that effective risk management is essential for sustaining tourism in the face of increasing exposure to diverse disasters, including natural, technological, and socio-political hazards. The study highlights how structured risk planning helps mitigate negative impacts and supports the long-term resilience of tourism destinations.

The study conducted by Zhang et al., revealed that the tourism sectors of both Jiuzhaigou and Aba experienced negative impacts in the aftermath of the earthquake. However, the overall tourism industry in Sichuan was comparatively less affected. The earthquake caused a substantial decline in tourist arrivals to Jiuzhaigou and Aba for multiple years. The impact of the earthquake exhibited month-to-month variability and exerted a substantial influence on Jiuzhaigou's comparative significance within Sichuan's tourism sector. The study highlighted the significance of domestic tourism and economic variety in attaining resilience and promoting local economic endeavors in the aftermath of natural calamities (Zhang et al., 2021).

The study conducted by Chan et al., revealed that the tourism industry's impact differs during different stages of a disaster. It notably affects the spread of information, communication, and the provision of emergency lodging for tourists. The long-term recovery and resolution phases encompass essential transformations, including the gathering of information, experiential learning, institutional restructuring, the formulation of sustainable tourism development strategies, and the implementation of post-disaster destination marketing. The study enhances current disaster management frameworks by integrating the viewpoint of tourism stakeholders. The findings have tangible implications for the formulation of tourism development and sustainability strategies in the Kumamoto area subsequent to the earthquake (Chan et al., 2019).

The study conducted by Ma et al., examines two categories of disasters: natural and man-made, with earthquakes and terrorist attacks serving as illustrative instances. The study employs online review data sourced from TripAdvisor and utilizes a difference-in-differences methodology to examine the impacts of various disaster events on the tourism industry. The study reveals that both natural and anthropogenic disasters exert an adverse impact on tourism, influencing both tourist influx and their overall experiences. The frequency of earthquakes exerts a more significant impact on tourism in comparison to their magnitude and severity. On the other hand, the perception of safety in tourist destinations is primarily influenced by the frequency and severity of terrorist attacks, rather than their impact on tourism. Furthermore, the study emphasizes that earthquakes have a more significant impact on tourist numbers in comparison to terrorist attacks (Ma et al., 2020).

Li-Wei Liu et al., study examines disasters, risks, and crises in the tourism and hospitality industry to develop a structured framework for resilience and recovery. Through bibliometric analysis and a systematic narrative review of 795 documents from the Web of Science and Scopus databases, it explores key themes such as crisis management, resilience, and recovery strategies. The findings emphasize the necessity of proactive planning, stakeholder collaboration, and adaptive measures to minimize disruptions. By presenting a holistic approach, this study contributes to the development of sustainable crisis management strategies for the tourism and hospitality sector (Liu et al., 2024). Kyoo-Man Ha explores the lack of comprehensive disaster management frameworks in international tourism despite increased interest during the pandemic.

This study investigates ways to enhance disaster management to mitigate human suffering and economic losses. Using qualitative content analysis, it examines passive and active disaster management approaches, comparing their impacts on tourists, the tourism industry, regional governments, and international organizations. The findings emphasize the necessity for stakeholders to transition from passive to active disaster management by improving networking, refining the disaster management cycle, and strengthening local education. This research provides a systematic framework that considers both the supply and demand aspects of disaster management in international tourism (Ha, 2024).

Jiahui Duan et al., conducted a study analyzing 302 articles on tourism crises from 1991 to 2020, sourced from the Social Sciences Citation Index. The study used bibliometric and content analyses to identify types, regional distribution, impacts, and synergistic factors of tourism crises. The findings revealed that tourism crises are diverse, event-driven, and primarily affect Asia, Europe, and North America. Impacts occur at macro, meso, and micro levels, influenced by positive, negative, and interactive factors. The research suggests significant future potential for studies on tourism crises (Duan et al., 2021). Baihaqi et al., conducted a study on the economic survival strategies of tourism entrepreneurs on Lombok Island during the earthquake and COVID-19, using methods such as documentation, interviews, and observation. His research revealed how government policies and diversified income strategies helped tourism entrepreneurs adapt during these challenging times (Baihaqi et al., 2023).

Ecotourism is a sustainable approach to utilizing natural resources with the potential for cost-effective funding. As a form of ecologically and socially responsible tourism, it fosters biodiversity while preserving both the environment and society. To support the growth of ecotourism and the progress of indigenous communities and their resources, it is important to understand the factors tourists consider when choosing a destination. This study by RAHMAN and HAQUE examines the key risk factors in selecting ecotourism destinations within a specific context. Using a sample of 377 tourists, the research investigates the relationships between various factors, with data analysis conducted using SPSS-AMOS. The findings emphasize the significant role of risk factors in shaping tourists' decisions. As a result, it is essential for the Bangladesh government, policymakers, and tourism managers to address these issues to increase tourism at ecotourism sites. Additionally, the results are valuable for helping stakeholders understand tourists' perceptions and guide the development of ecotourism while mitigating potential challenges (Rahman & Haque, 2021). Iqbal et al., examine geotourism through geological and geographical approaches, leading to initiatives like geohazard tourism focused on faults and earthquakes. Their study identifies the Great Sumatran Fault depression in West Lampung, shaped by volcanic activity, fault movements, and river erosion. Comparing it to global geomorphosites, they highlight its significance in geotourism. The site, impacted by the 1908, 1933, and 1994 earthquakes, offers opportunities for geohazard tourism, enhancing public understanding of natural processes and land use through real-world examples (Iqbal et al., 2023). Scawthorn (2020) provides a detailed assessment of the August 17, 1999 Marmara earthquake in Turkey, underscoring the widespread destruction and its implications for infrastructure, including tourism-related facilities. The report illustrates how large-scale natural disasters can severely disrupt local economies and highlights the necessity of disaster preparedness within tourism planning.

METHODOLOGY

The present research is based on literary narratives as a source of data, primarily relying on secondary data and an experience-based methodology. The study employed a document analysis approach, where various textual and visual resources were examined to contribute to the research topic. The data collection process involved the use of secondary data sources, including documents, publications, statements from influential figures in the tourism industry, press releases from the Minister of Tourism, official reports, and statistical data from organizations such as the World Tourism Organization, OECD, Statista, and the Department of Tourism, Government of Türkiye. Additional sources included media reports and interviews.

To gather the necessary data, the study accessed databases such as WoS, Scopus, Ebsco, Proquest, Sciencedirect, Emerald Insight, Dergipark, and other global sectors under the category of service products. Information on tourism was obtained using document analysis techniques. The research also involves descriptive statistics as the method of analysis. Tourist statistics issued by the Department of Tourism, Government of Türkiye, were utilized to analyze and collect information about the tourism industry. The study compares quantitative evaluations, specifically examining trends in visitor arrivals during two consecutive periods: 1995-2002 and 2017-2023. These trends were analyzed to assess the impact of the earthquake on tourism by comparing the periods before and after the devastation caused by the earthquake.

Global Environmental Risks and Tourism

The World Economic Forum in 2019 identified five significant global environmental risks: extreme weather events, inadequate efforts to address climate change and adapt to its effects, significant loss of biodiversity and collapse of ecosystems, major natural disasters, and environmental damage and disasters caused by human activities. The tourism industry is severely impacted by extreme weather events such as floods, storms, extreme heat, and cold waves (Windle & Rolfe, 2013). These destinations may diminish tourists' enthusiasm due to tourists' general sensitivity to climate. Temperature, in particular, has been a significant factor influencing tourism demand (Bigano et al., 2005). Climate change poses a significant obstacle to the tourism industry, impacting it currently and projected to have even more far-reaching consequences in the future (Scott et al., 2012; Tuna & Özyurt, 2017). These effects manifest in various ways, such as the choices made by consumers in selecting destinations, the spatial distribution of tourism demand, and the long-term viability and competitiveness of destinations. Hence, the lack of success in implementing strategies and actions to address climate change presents a significant threat to the tourism sector (Scott et al., 2016). It is imperative to assess the existing tourism assets, assess the extent of the damage, identify the issues and reasons for the stagnation in the tourism sector, understand the requirements of service providers impacted by the earthquake, develop new products aimed at boosting local demand, and execute communication and destination marketing strategies to promote the industry (Garcia et al., 2018).

Unplanned tourism negatively impacts biodiversity, whereas ecotourism is a significant and expanding sector of tourism that relies heavily on biodiversity and ecosystem services. This type of tourism faces a substantial risk of experiencing major biodiversity loss and ecosystem collapse, whether on land or in the sea. For instance, research indicates that the harm inflicted upon coral reefs has resulted in permanent consequences for the eco-tourism industry (Simpson, 2003). In their study, Tursab & Tuader (2017) documented a decline in the biodiversity of plants and animals due to the uncontrolled growth of tourism in Mugla, Turkiye. Significant local and global extinctions of plant and animal species are anticipated, which would have an impact on eco-tourism (Simpson, 2003). Hence, mitigating this risk is heavily contingent on safeguarding biodiversity. The tourism sector is frequently impacted by catastrophic natural disasters such as earthquakes, tsunamis, volcanic eruptions, wildfires, and geomagnetic storms (Ritchie et al., 2010).

They cause harm to the infrastructure and facilities that are associated with tourism, such as hotels, as well as the resources that are important for attracting tourists, such as popular tourist sites. Additionally, they contribute to the decline and degradation of tourist destinations (Park & Reisinger, 2010). Typically, there is a decline in tourism demand for areas that have been affected by major disasters (Sharpley, 2005). Notable recent disasters that had a significant impact on the tourism industry include the 2004 Asian Tsunami, the 2010 Eyjafjallajokull volcanic eruption in Iceland, the 2011 Great East Japan earthquakes and tsunami, the 2011 flooding in Thailand, the 2010-2012 Christchurch earthquakes in New Zealand, and the 2013 Southern Alberta flood in Canada (Scott et al., 2012). A substantial proportion of the casualties from the 2004 Indian Ocean Tsunami consisted of tourists and individuals employed in the tourism sector (Thitthongkam & Walsh, 2011). This event impacted the influx of international tourists to countries such as Indonesia and Thailand in the tourism industry for several years (Thitthongkam & Walsh, 2011). In the first half of 2005, the number of international tourists visiting Phuket, Thailand, experienced a significant decline of 67.2% (Kuo et al., 2008).

An instance of a calamity impacting operations in the tourism industry can be observed in the state of Indonesian tourism in 2018, specifically in Lombok, West Nusa Tenggara. Lombok Island is among the ten national tourism priority areas that have been established by the tourism ministry. The 2018 earthquake had both physical and psychological impacts on the victims, as well as repercussions on the tourism industry. The earthquake is projected to result in economic losses that could lead to a potential decline of approximately 100,000 foreign tourists within a one-month period (6 August - 6 September 2018). These losses are estimated to amount to USD 100 million, assuming an average expenditure of USD 1,000 per visit. Moreover, in terms of spatial impact, the disaster has affected significant tourist attractions on the island of Lombok, such as the climbing areas of Mount Rinjani, Gili Terawangan, Gili Meno, and several other locations (Hadi, 2019).

Türkiye's tourism industry can be significantly impacted by various natural hazards, including flooding, earthquakes, and drought. Türkiye's prominent tourist destinations are prone to significant seismic hazards and risks. An earthquake of significant magnitude can impact tourists, tourist infrastructure, facilities, and cultural heritages, which are key factors contributing to the development and growth of tourism in Turkiye (Çetinsöz et al., 2012). Likewise, anthropogenic environmental harm and calamities such as oil spills, radioactive pollution, and so on, can significantly impact the tourism industry. Significant oil spills, like the Deepwater Horizon oil spill in the Gulf of Mexico in 2010, contaminate coastal areas and diminish their appeal to tourists. The ability to travel to areas contaminated with radioactivity is reduced. Urban areas like Istanbul face significant environmental hazards, with air pollution being a prominent concern (TURSAB, 2017). The impact on tourists, particularly elderly individuals who are more susceptible to the hazards of pollution, is significant.

General Features of Türkiye

Due to its location, Türkiye has an advantageous position from many perspectives, as it is located at important intersections around the world. Being located in a strategic region where the continents of Europe, Asia, and Africa converge makes Türkiye an intercontinental bridge. The country's population stands at 85.3 million according to recent figures, and its total area covers 783,562 square kilometers, indicating that Türkiye occupies a relatively vast geographical territory. The richness of the country's natural and human resources offers various opportunities for tourism. The fact that tourism accounts for 4.6 percent of Turkiye's Gross Domestic Product (GDP) underscores its significant role in the country's tourism sector (World Bank, 2022).

Earthquake, Its spatial extent, and Damages

The North Anatolian Fault Zone (NAFZ) is the most seismically active strike-slip fault in Europe and Asia Minor. It serves as the demarcation line between the Anatolian and Eurasian tectonic plates (Sengor et al., 2005). Throughout the 20th century, a sequence of significant and destructive earthquakes occurred as a result of this particular fault. One of the destructive earthquakes that resulted in long-term damage was the Marmara earthquake, which happened on August 17, 1999. The 1999 Marmara earthquake, also known as the earthquake in Kocaeli Province, occurred on August 17, 1999. It originated on the North Anatolian Fault Zone (NAFZ) and its epicenter was located near the easternmost end of Izmit Bay in northwestern Türkiye. The earthquake transpired at 03:01:39 a.m. local time, during the nocturnal hours, when the inhabitants of the area were at their residences, in a state of slumber. Following a recurring trend observed in the NAFZ, the aforementioned earthquake was succeeded by another significant event on November 12, 1999, commonly referred to as the 1999 Duzce - Bolu earthquake. The occurrence of this event marked the final separation of the Duzce Fault (a fault that runs parallel to the North Anatolian Fault Zone) which had already been set in motion by the 1999 Marmara earthquake. As a result, further devastation and loss of life occurred in the already severely affected region. (MCEER, 2000). The red color represents areas with the highest seismic risk, pink indicates moderate risk zones, yellow signifies lower-risk areas, and white shows regions with the least seismic risk. However, the map is missing essential components, including the legend, orientation elements, and scale, which makes it difficult to fully interpret the map's data and accurately assess the seismic risk levels. On February 6, 2023, between 04:17 and 13:24 Turkish local time, two earthquakes measuring 7.7 Mw and 7.6 Mw, with epicenters in Pazarcik (Kahramanmarash) and Elbistan (Kahramanmarash), respectively, occurred. Both earthquakes were felt very strongly and caused severe damage and loss of life in Kahramanmarash, Hatay, Adiyaman, Gaziantep, Malatya, Kilis, Diyarbakir, Adana, Osmaniye, Shanliurfa, and Elazig. The earthquake affected an area of 108,812 km^2, covering 11 provinces in Eastern and Southeastern Anatolia (Figure 1). Based on strong ground motion records, field observations, and information obtained from local residents, it is possible to say that the first earthquake was more forceful in Kahramanmarash and Hatay, while the second earthquake was particularly forceful in Malatya. These two major shocks, which are recorded as the most devastating earthquake storms in the country's history, require immediate attention and action for relief and recovery efforts (AFAD, 2023).

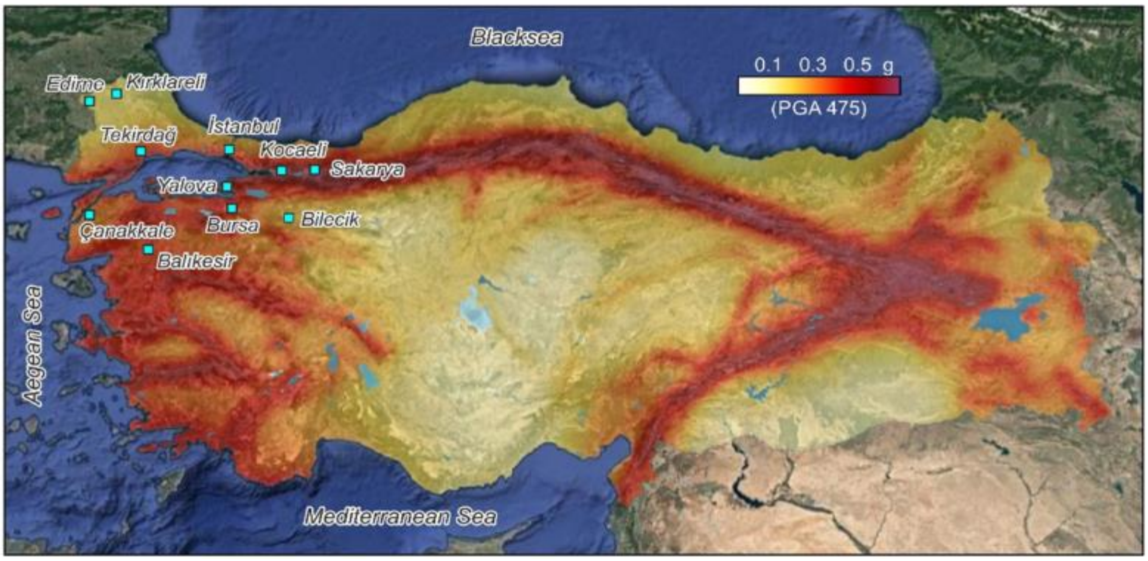

Figure 1. The Turkish Earthquake Hazard Map visualizes the seismic risk levels across various regions (Source: Işık et al., 2020)

Role of Tourism on Turkish Economy

Contemporary economies direct their policies toward stability and growth. In achieving these goals, the contribution of the tourism sector is becoming increasingly important. Tourism, with its dynamic and economic nature, serves as a solution to national and international economic problems and acts as a gateway to overcome economic bottlenecks. The tourism sector is one of the most rapidly growing and high-capacity sectors among the industries within GDP. With its ability to generate foreign exchange and contribute to economies, tourism has a significant effect on GDP and employment. The values related to tourism revenues and their share in gross domestic product are included in Figure 3 and Figure 4. Figure 2 presents the monthly distribution of foreign visitor arrivals from 1995 to 2001.

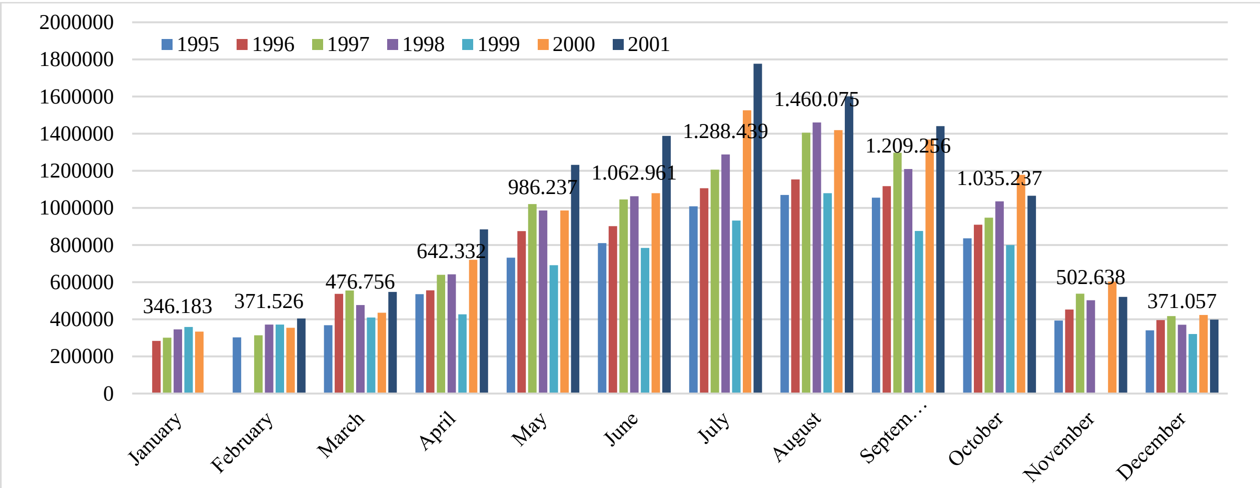

Figure 2. Statistics of tourists visiting Turkiye by months and years (1995-2001) (Source: TURSAB, 2024)

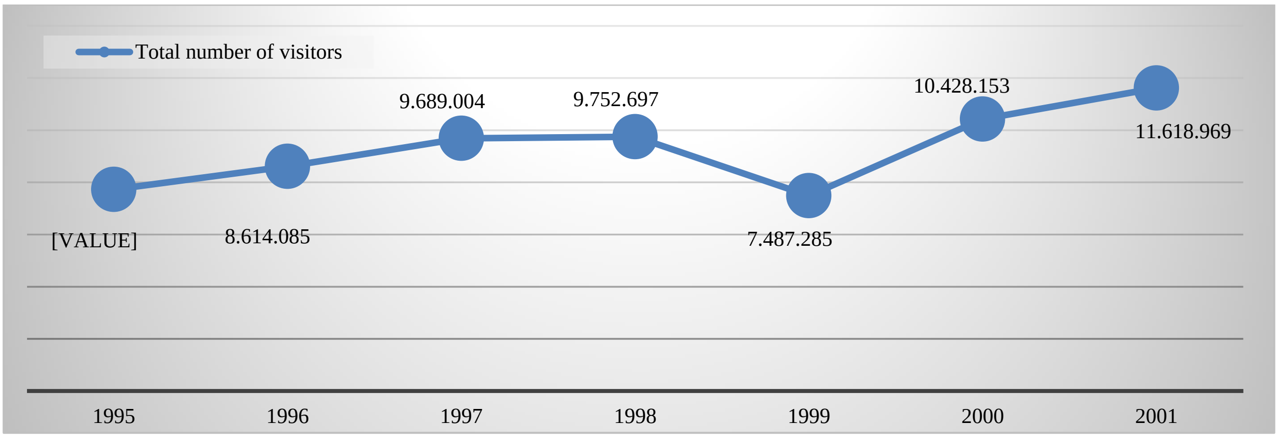

Figure 3. Total number of visitors to Türkiye by years (1995- 2001) (Source: TURSAB, 2024)

The data reveals a general seasonal trend, with the highest number of visitors recorded in the summer months (June to September) across all years. However, a sharp decline is noticeable in 1999, following the 1999 earthquake, where the number of arrivals was lower compared to previous years, particularly in the peak tourism months. The recovery begins in 2000, with a notable increase in visitor numbers. Figure 3 clearly illustrates the sharp decline in the total number of foreign visitors following the 1999 earthquake. In 1998, the number of international arrivals peaked at 9,752,697, but in 1999, this figure dropped drastically to 7,487,285, marking a 23.2% decrease.

This sudden decline reflects the immediate impact of the earthquake on the tourism sector, as concerns about safety, infrastructure damage, and overall uncertainty deterred travelers. However, in 2000, the data shows a strong recovery, with visitor numbers rebounding to 10,428,153, surpassing pre-earthquake levels. By 2001, the upward trend continued, reaching 11,618,969. This suggests that while natural disasters can cause short-term disruptions in tourism, the industry can recover quickly with proper crisis management and restoration efforts.

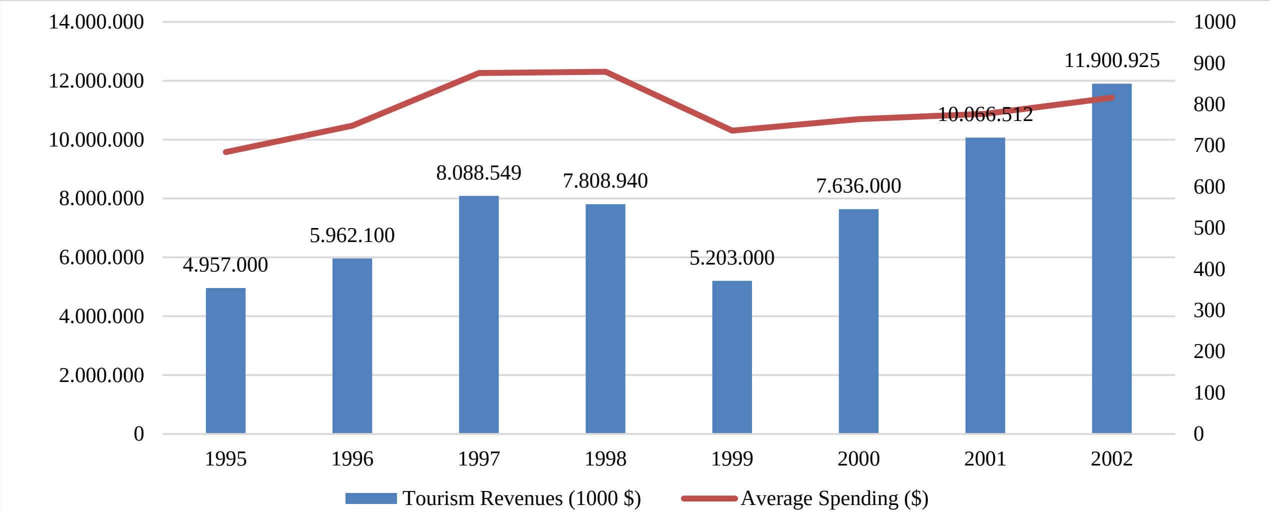

Figure 4. Distribution of Tourism Revenues and Average Spending (Source: TURSAB, 2024)

Figure 4 illustrates the significant financial losses in the tourism industry caused by the 1999 earthquake. The total revenue loss amounted to 173 million USD, with 15 million USD lost due to canceled congresses and an additional 3 million USD from canceled tours. Furthermore, 8,000 tourists cut short their vacations and returned to their home countries, while 156,000 reservations were canceled, resulting in a financial loss of 105,000 USD.

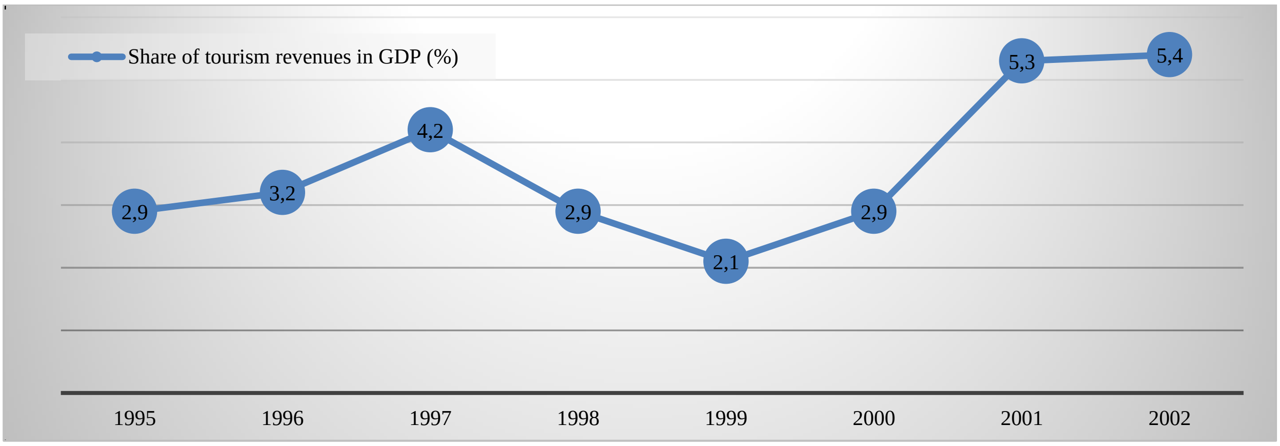

Figure 5. Share of tourism revenues in GDP (Source: TURSAB, 2024)

Figure 5 highlights the decline in the tourism sector following the earthquake. The number of tourists showed an increasing trend before the disaster; however, in September 1999, there was a sharp decline. The overall decrease in the tourism sector was approximately 27% compared to the previous year. Additionally, the table summarizing tourism revenues from 1995 to 2002 indicates a significant drop in 1999, with total revenues amounting to 2,605 million USD.

Figure 6 presents the total number of tourists visiting Türkiye from 2017 to 2023. In 2017, Türkiye attracted 38,620,346 tourists. This number increased steadily in the following years, reaching 45,628,673 in 2018 and 51,860,042 in 2019. However, due to the COVID-19 pandemic, there was a drastic decline in 2020, with only 15,826,266 tourists visiting the country. In 2021, a recovery was observed, with the number of tourists rising to 29,357,463. Projections for 2022 suggest that the number of tourists will increase to 51,369,026, surpassing the pre-pandemic levels of 2019. As of July 2023, a total of 29,324,605 foreign visitors had come to Türkiye, despite the devastating Kahramanmaras earthquake.

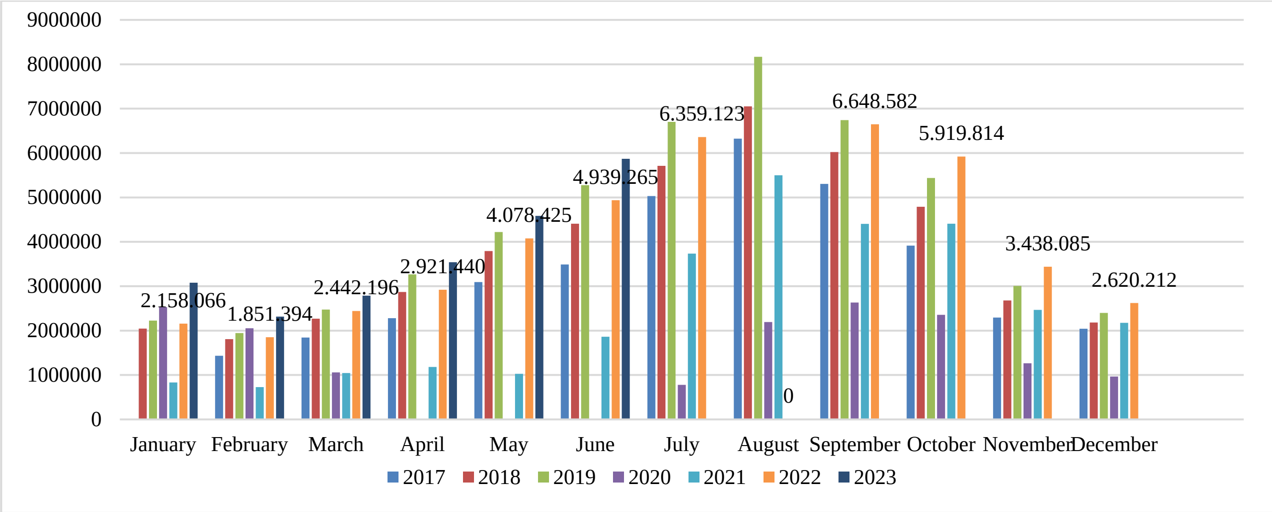

Figure 6. Statistics of tourists visiting Turkiye by months and years (2017- 2023) (Source: (TUIK, 2024)

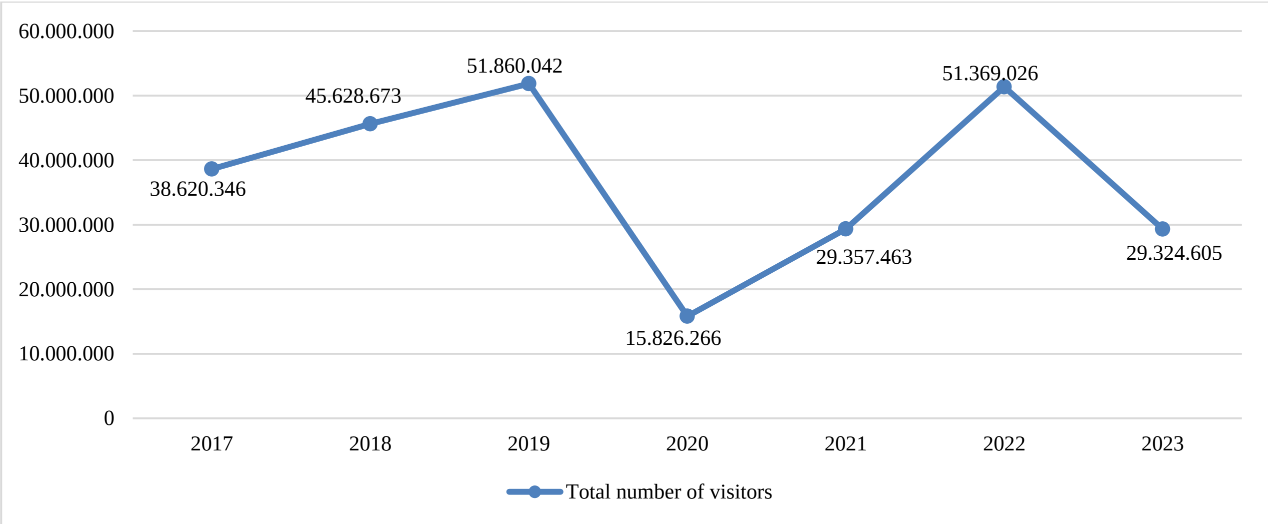

Figure 7. Total number of visitors to Türkiye by years (2017-2023) (Source: (TUIK 2024)`

Figure 7 illustrates the number of tourists by month from 2017 to 2023. July and August have consistently been the months with the highest number of tourist arrivals, except in 2020 when the COVID-19 pandemic led to a significant reduction in tourism. The data also shows a gradual increase in tourist arrivals from January to May, with June being another peak month, following the summer months. Despite the challenges posed by the earthquake in 2023, there was no significant drop in the number of tourists visiting Türkiye.

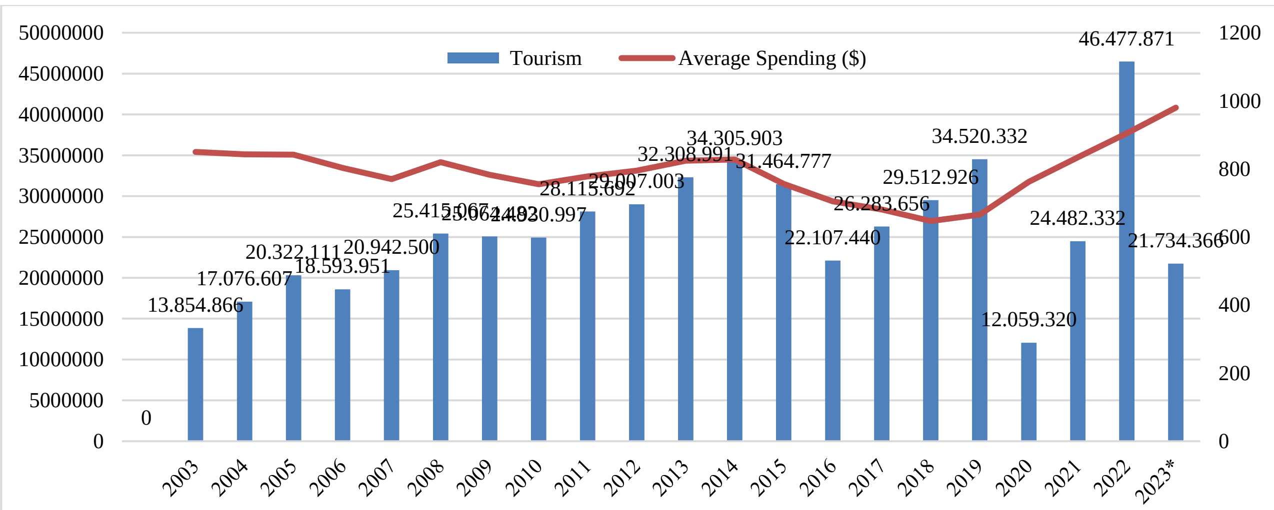

Figure 8. Distribution of Tourism Revenues, Average Spending by Year (2003-2022) (Source: The Ministry of Culture and Tourism 2024)

Figure 8 illustrates the distribution of tourism revenues and average spending in Türkiye from 2003 to 2023. Tourism revenues showed a steady increase from 2003 until 2014, reaching a peak of $34,305,903,000 in 2014. However, in 2015, the plane crisis led to a significant drop in the number of Russian tourists, and further declines were observed in 2016 due to the coup attempt and a series of terrorist attacks. The biggest contributing factor was the negative image and embargoes resulting from the plane crisis. A recovery trend began in 2017 and 2018, leading to a new peak in 2019, when tourism revenues reached $34,520,332,000, accounting for 4.6% of GDP.

The COVID-19 pandemic caused a sharp decline in tourism revenues, dropping to $12,059,320,000 in 2020. The average spending per tourist also fell from $850 in 2019 to $666 in 2020, before recovering slightly to $762. In 2021, a partial recovery was observed, with tourism revenues increasing to $24,482,332,000 (3.1% of GDP). The projected data for 2022 indicates a decrease in revenues to $14,171,591,000, accounting for 2.4% of GDP. Since the data for 2023 is incomplete, it is not yet possible to calculate the share of tourism revenues in GDP. However, available data shows that tourism revenues in 2023 amounted to $21,734,366, with an average spending per tourist of $980.

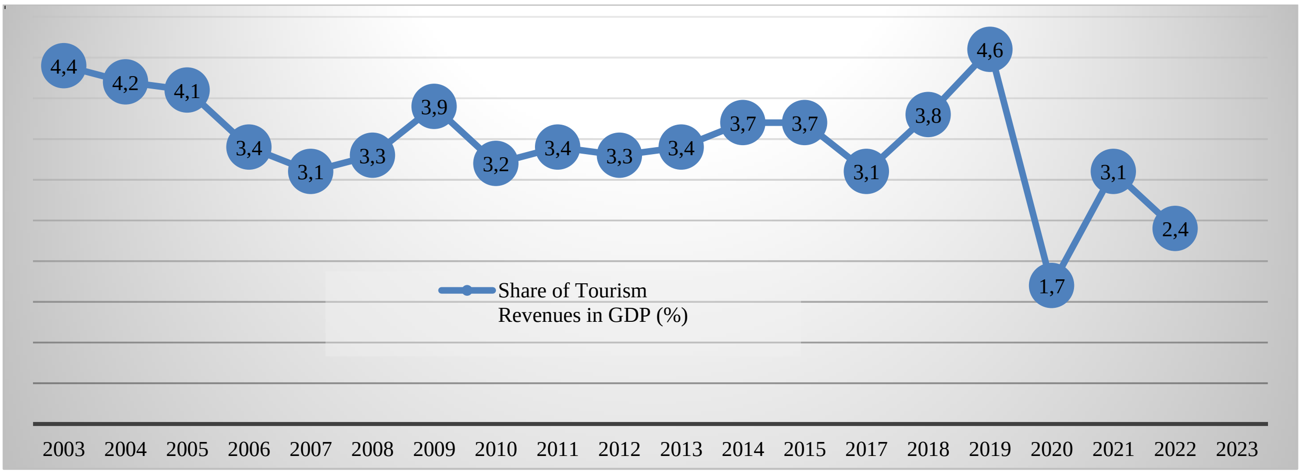

Figure 9. Share of tourism revenues in GDP (Source: The Ministry of Culture and Tourism 2024)

Figure 9 presents the share of tourism revenues in GDP over the years 2003–2023. The share of tourism revenues in GDP fluctuated throughout the period, with the highest recorded share in 2019 at 4.6%. The data also shows that average tourist spending declined in the early years but has been increasing steadily since 2014. However, based on this observation and the available data, the 2023 earthquake does not appear to have significantly impacted Turkish tourism in the first half of the year. In 2023 the Russia- Ukraine war has resulted in Europe imposing sanctions on Russia, leading to Russia's banning of access to Europe. Figure 10 shows that however, despite these developments, when compared to previous years, this event has not caused a significant surge in the number of tourists traveling to Turkiye.

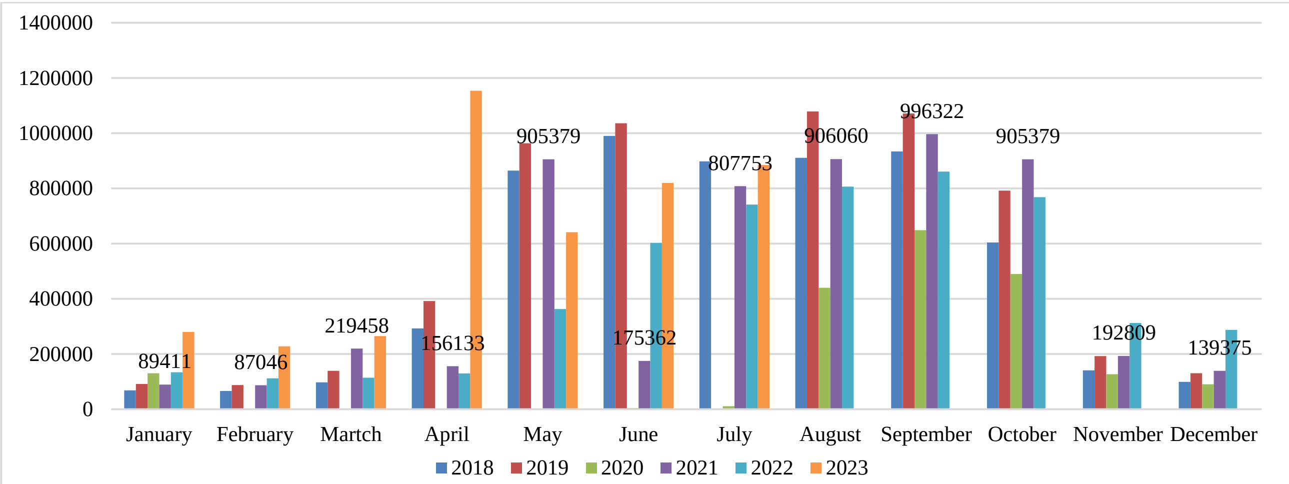

Figure 10. Total number of visitors from Russia to Turkiye for per year (2018- 2023) (Source: The Ministry of Culture and Tourism 2024)

CONCLUSION AND SUGGESTION

Various factors, such as security, socioeconomic and demographic variables (such as age, gender, education, religion, tourism motivation, personal experience, and income), shape perceptions of tourism risk and decision-making. The impact of disaster events on tourism at a destination is influenced by the characteristics, magnitude, and frequency of the events, as well as the destination's ability to recover and adapt in the tourism sector. In order to conduct our investigation, we employed qualitative research methods in this article. Examining the tourism data from the 1999

Marmara earthquakes reveals a substantial decline in both tourist arrivals and tourism earnings in Turkiye. The total number of international visitors for the entire year was 7,487,285, which represents a decrease compared to the previous year's total of 9,752,697. The tour cancellations led to a financial loss of 3 million USD.

The comparison of tourism statistics before and after the August 1999 earthquake shows a 25% decline in tourism during the months of August and September. Based on effect of the 2023 earthquake, it is possible to see no any decline in Turkish tourism for the year. The main reason for the lack of a decrease in tourism after an earthquake is not primarily due to Russian tourists choosing Turkiye for their vacations because they couldn't go to Europe. Instead, statistics demonstrate the opposite. The primary reason appears to be that tourist destinations are located far from earthquake-prone cities. When we look at the earthquake map that we used in our research, we see that Gaziantep, Hatay/Osmaniye, Adyaman, Diyarbakir/Sanliurfa, Kahramanmarash, Kilis, Adana, and Malatya are high-risk areas for earthquakes. These areas are clearly remote from tourist attractions. However, if potential customers are unaware of this fact, it will have a significant effect on tourism. It is critical to develop plans and strategies to accelerate the recovery process as soon as possible. The following are the proposals that must be implemented to accelerate the recovery.

- ✓ The first step is to repair and rebuild damaged infrastructure such as roads, bridges, and public buildings. This will help ensure that tourists can visit the region safely and have a good time.
- ✓ Use social media to promote tourism: social media is a powerful tool for promoting tourism. Share photos, videos, and stories about Turkiye's tourist region on social media platforms like Facebook, Twitter, and Instagram. Share informative videos about places far from the earthquake zone, such as Antalya, Bodrum, and Mula. Especially responding to comments and messages is another way to interact with potential tourists.
- ✓ Create targeted campaigns: Create targeted marketing campaigns aimed at specific demographics or geographical areas. You could, for example, create a campaign aimed at families, adventurers, or foodies.
- ✓ With online travel agencies like Expedia, Booking.com, and TripAdvisor to promote the region and make it easier for tourists to book their trips.
- ✓ Leverage media coverage: Use media coverage of the earthquake as an opportunity to promote the region. Reach out to journalists and bloggers and provide them with information about the region, its unique features, and the recovery efforts following the earthquake.

There are certain limitations that need to be considered. The primary limiting factor is it is anticipated that there will be a multitude of crises that have the potential to exert an influence. At a certain point in time, there was a specific location that served as a destination. With that being stated, the methodology solely focuses on identifying the occurrences of structural breaks within an intracellular context and determining their respective dates. Consequently, it becomes challenging to establish accountability for the structural break in the international tourism market between either of these crises. Furthermore, given the previous identification of structural breaks, it is important to recognize that the deliberate monitoring of statistics for the purpose of authentication seems to be feasible only within a specific timeframe.

Author Contributions: Conceptualization, A.V.; methodology, A.V.; software, A.V.; validation, A.V.; formal analysis, A.V.; investigation, A.V.; data curation, A.V.; writing - original draft preparation, A.V.; writing - review and editing, A.V.; visualization, A.V.; supervision, A.V.; project administration, A.V. Authors has read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The author declare no conflict of interest.

REFERENCES

AFAD. (2023). *06 Şubat 2023 Kahramanmaraş (Pazarcık ve Elbistan) depremleri saha çalışmaları ön değerlendirme raporu [06 February 2023 Kahramanmaraş (Pazarcık and Elbistan) earthquakes field study preliminary assessment report*]. Research Report. https://deprem.afad.gov.tr/assets/pdf/Arazi_Onrapor_28022023_surum1_revize.pdf

Association of Turkish Travel Agencies (TURSAB). (n.d.). *Tourist numbers and tourism revenue statistics.* Retrieved March 3, 2024. https://www.tursab.org.tr/istatistikler/turist-sayisi-ve-turizm-geliri

Baihaqi, M., Salahuddin, M., & Nasution, D. S. (2023). Earthquake, COVID, and the economic survival: How tourism entrepreneurs in Lombok survived during the double disaster. *Journal of Environmental Management & Tourism, 14*(6), 2596-2604. https://doi.org/10.14505/jemt.v14.6(70).10

Bigano, A., Goria, A., Hamilton, J., & Tol, R. S. (2005). *The effect of climate change and extreme weather events on tourism*. Edward Elgar: Cheltenham, 173-190.

Chan, C. S., Nozu, K., & Cheung, T. O. L. (2020). Tourism and natural disaster management process: perception of tourism stakeholders in the case of Kumamoto earthquake in Japan. *Current Issues in Tourism*, 23(15), 1864-1885. https://doi.org/10.1080/13683500.2019.1666809

Çetinsöz, B. C., & Ege, Z. (2012). Risk reduction strategies according to demographic features of tourists: the case of Alanya. *Anatolia: Turizm Araştırmaları Dergisi,* 23(2), 159-172.

Duan, J., Xie, C., & Morrison, A. M. (2022). Tourism crises and impacts on destinations: A systematic review of the tourism and hospitality literature. *Journal of Hospitality & Tourism Research*, 46(4), 667-695. https://doi.org/10.1177/1096348021994194

Ewing, B. T., Kruse, J. B., & Özdemir, Ö. (2004). Disaster losses in the developing world: Evidence from the August 1999 earthquake in Turkey. *Discussion Paper*, No. 2004/19, 1-22.

Faisal, A., Albrecht, J. N., & Coetzee, W. J. (2020). (Re) Creating spaces for tourism: Spatial effects of the 2010/2011 Christchurch earthquakes. *Tourism Management*, 80, 104102. https://doi.org/10.1016/j.tourman.2020.104102

Garcia, N., Doumet, Y., & Carreño, L. (2018). Post-earthquake strategic tourism plan for the municipality of Bolívar, Manabí, Ecuador. *GeoJournal of Tourism and Geosites*, 23(3), 881–894. 10.30892/gtg.23322-336.

Ha, K. M. (2024). Improving disaster management in international tourism. *Management Review Quarterly*, 74(3), 1423-1437. https://doi.org/10.1007/s11301-023-00338-4

Hadi, S. (2019). Learning from the legacy of post-disaster recovery in Indonesia for the acceleration of post-disaster recovery in Lombok. *Jurnal Perencanaan Pembangunan: The Indonesian Journal of Development Planning*, *3*(1), 14-31.

Guliyev, H. (2022). The effect of global financial markets and local shocks on Turkey airlines market; new evidence from structural break cointegration and causality tests. *Research in Globalization*, 5, 100096.

Huang, L., Yin, X., Yang, Y., Luo, M., & Huang, S. S. (2020). "Blessing in disguise": The impact of the Wenchuan earthquake on inbound tourist arrivals in Sichuan, China. *Journal of Hospitality and Tourism Management*, 42, 58-66. https: //doi.org/10.1016/j.jhtm.2019.11.011

Iqbal, P., Wibowo, D. A., Raharjo, P. D., Lestiana, H., & Puswanto, E. (2023). The great sumatran fault depression at West Lampung District, Sumatra, Indonesia as geomorphosite for geohazard tourism. *GeoJournal of Tourism and Geosites*, 47(2), 476-485. https://doi.org/10.30892/gtg.47214-1046

Işık, E., Büyüksaraç, A., Ekinci, Y. L., Aydın, M. C., & Harirchian, E. (2020). The effect of site-specific design spectrum on earthquake-building parameters: A case study from the Marmara region (NW Turkey). Applied Sciences, 10(20), 7247. https://doi.org/10.3390/app10207247

Kuo, H. I., Chen, C. C., Tseng, W. C., Ju, L. F., & Huang, B. W. (2008). Assessing impacts of SARS and Avian Flu on international tourism demand to Asia. *Tourism management*, 29(5), 917-928. https://doi.org/10.1016/j.tourman.2007.10.006

Liu, L. W., Pahrudin, P., Tsai, C. Y., & Hao, L. (2024). Disaster, risk and crises in tourism and hospitality field: A pathway toward tourism and hospitality management framework for resilience and recovery process. *Natural Hazards Research*, 4(4), 653-668. https://doi.org/10.1016/j.nhres.2024.06.001

Ma, H., Chiu, Y. H., Tian, X., Zhang, J., & Guo, Q. (2020). Safety or travel: Which is more important? The impact of disaster events on tourism. *Sustainability*, 12(7), 3038, 1-15. https://doi.org/10.3390/su12073038

Min, J., Kc, B., Kim, S., & Lee, J. (2020). The impact of disasters on a heritage tourist destination: A case study of Nepal earthquakes. *Sustainability*, 12(15), 6115, 1-12. https://doi.org/10.3390/su12156115

Park, K., & Reisinger, Y. (2010). Differences in the perceived influence of natural disasters and travel risk on international travel. *Tourism Geographies*, *12*(1), 1-24. https://doi.org/10.1080/14616680903493621

Rahman, M. M., & Haque, A. (2024). Analysis of Tourists Risk Perceptions In Tour Destination Selection: Bangladesh Ecotourism Perspective. *Geojournal of Tourism and Geosites*, 56(4), 1493-1503. https://doi.org/10.30892/gtg.56406-1320

Ritchie, J. B., Amaya Molinar, C. M., & Frechtling, D. C. (2010). Impacts of the world recession and economic crisis on tourism: North America. *Journal of travel research*, 49(1), 5-15. https://doi.org/10.1177/0047287509353193

Scawthorn, C. (2000). The Marmara, Turkey Earthquake of August 17, 1999: Reconnaissance Report. In *The Marmara, Turkey earthquake of August 17, 1999: Reconnaissance report*, 190-190.

Scott, D., Hall, C. M., & Gössling, S. (2016). A report on the Paris Climate Change Agreement and its implications for tourism: Why we will always have Paris. *Journal of Sustainable Tourism*, 24(7), 933-948. https://doi.org/10.1080/09669582.2016.1187623

Scott, D., Hall, C. M., & Stefan, G. (2012). Tourism and climate change: Impacts, adaptation and mitigation. Routledge. https://doi.org/10.4324/9780203127490

Sharpley, R. (2005). The Tsunami and Tourism: A Comment. *Current Issues in Tourism* (8)4: 344-349. https://doi.org/10.1080/13683500508668222

Simpson, M. C. (2007). *Tourism, livelihoods, biodiversity, conservation and the climate change factor in developing countries*. In C. M. Hall & J. Higham (Eds.), Climate Change and Tourism: Assessment and Coping Strategies. 81-111. https://doi.org/10.1108/TRC-01-2024-0002

Sengor, A. M. C., Tüysüz, O., Imren, C., Sakınç, M., Eyidoğan, H., Görür, N., & Rangin, C. (2005). The North Anatolian fault: A new look. Annu. Rev. *Earth Planet. Sci.*, 33(1), 37-112. https://doi.org/10.1146/annurev.earth.32.101802.120415

The Ministry of Culture and Tourism. n.d. "*Tourism Statistics*." https://www.ktb.gov.tr/?_Dil=2 Date of Access: 2024.

Thitthongkam, T., & Walsh, J. (2011). An analysis of factors influencing the competitiveness of the Thai tourism industry. In *International Conference on Business and Economics* Research Vol. 1, 138-141. https://doi.org/10.1016/S2212-5671(15)00569-9

Tuna, M., & Özyurt, B. (2017). *Türkiye Turizm Sektöründe Risk Yönetimi*", 3. Turizm Şurası Tebliğler Kitabı, 1-3.

Türkiye İstatistik Kurumu. (n.d.). Turizm İstatistikleri IV. Çeyrek (Tourism Statistics IV. Quarter): Ekim-Aralık ve Yıllık (October-December and Annual), 2022. Accessed: 2024. https://data.tuik.gov.tr/Bulten/Index?p=Turizm-Istatistikleri-IV.Ceyrek:-Ekim-Aralik-ve-Yillik-2022-49606

TÜRSAB; TUADER. (2017). *Turizm Sektör Raporu (Tourism Sector Report)*, Ocak-Haziran Dönemi (January-June Period), Accessed: 2024. https://www.tursab.org.tr

Ural, M. (2015). Importance of risk management for the sustainability of tourism. *Balıkesir Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 18(33), 163-178. https://doi.org/10.31795/baunsobed.645446

N., Kodir, A., Idris, I., & Islam, M. N. (2020). Accelerating tourism development by community preparedness on disaster risk in Lombok, Indonesia. *Geojournal of Tourism and Geosites*, 29(2), 545-553. https://doi.org/10.30892/gtg.29213-488

Windle, J., & Rolfe, J. (2013). The impacts of the 2011 extreme weather events on holiday choices of Brisbane residents. Australasian *Journal of Environmental Management*, 20(4), 338-350.

World Economic Forum. (2019). *The global risks report 2019* (14th ed.). World Economic Forum. https://www3.weforum.org/docs/WEF_Global_Risks_Report_2019.pdf

Zhang, J., & Cheng, L. (2019). Threshold effect of tourism development on economic growth following a disaster shock: Evidence from the Wenchuan earthquake, PR China. *Sustainability*, 11(2), 371. https://doi.org/10.3390/su11020371

Zhang, M., Seyler, B. C., Di, B., Wang, Y., & Tang, Y. (2021). Impact of earthquakes on natural area-driven tourism: Case study of China's Jiuzhaigou National Scenic Spot. *International Journal of Disaster Risk Reduction*, 58, 102216. https://doi.org/10.1016/j.ijdrr.2021.102216

Article history: Received: 10.02.2025 Revised: 14.05.2025 Accepted: 05.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1168-1178
DOI 10.30892/gtg.602spl14-1490

THE ROLE OF RECEPTIVE TRAVEL AGENCIES IN PROMOTING SUSTAINABLE RURAL-SPA DESTINATION DEVELOPMENT

Martina ARSIC [1], Petar BOJOVIC [2], Aleksandra VUJKO [1*]

[1] University of Singidunum, Faculty for Tourism and Hotel Management, Belgrade, Serbia; martina.arsic.23@singimail.rs (M.A.); avujko@singidunum.ac.rs (A.V.)
[2] Independent Researcher, Belgrade, Serbia; p_bojovic@yahoo.com (P.B.)

Citation: Arsić, M., Bojović, P., & Vujko, A. (2025). The role of receptive travel agencies in promoting sustainable rural-spa destination development. *Geojournal of Tourism and Geosites*, 60(2spl), 1168–1178. https://doi.org/10.30892/gtg.602spl14-1490

Abstract: The aim of this research is to determine the role of receptive travel agencies in the promotion of sustainable rural spa tourism and to evaluate their overall significance for the sustainable development of rural tourist destinations in Serbia, with a specific focus on the spa town of Sokobanja. This study examines how receptive agencies influence the flow of foreign tourists, facilitate deeper visitor engagement, and contribute to the economic, socio-cultural, and environmental sustainability of these destinations. A particular emphasis is placed on their role in preserving, interpreting, and communicating the value of local natural and cultural heritage to visitors. To achieve these objectives, a mixed-method research design was employed within an interpretivist epistemological framework, prioritizing the subjective experiences of tourists and the perspectives of key tourism stakeholders. The first phase of the research consisted of a structured survey conducted with 318 foreign visitors to Sokobanja between March and October 2024. The data obtained were analyzed using factor analysis to identify underlying dimensions, followed by Structural Equation Modeling (SEM) to explore the relationships between key constructs. The second phase involved qualitative methods, including desk research and semi-structured interviews with staff from the Tourist Organization of Sokobanja and representatives of the local receptive travel agency "DM." The findings highlighted the agencies' essential role in creating value-added experiences for tourists by offering personalized services, cultural interpretation, and logistical support. Four key factors were identified—Unique Experience, Immediate Involvement, Getting to Know, and Mediation—which collectively explain the ways in which receptive agencies enrich tourist experiences and contribute to destination competitiveness. The study concludes that the strategic integration of receptive agencies into destination management plans can significantly improve the visibility, inclusivity, and sustainability of rural spa tourism in Serbia. Their proactive engagement not only supports the local economy but also encourages responsible tourism practices aligned with long-term destination stewardship

Keywords: receptive travel agencies, promotion, sustainability, rural tourism, spa tourism, Sokobanja

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INTRODUCTION

In an increasingly interconnected world, the dynamics of travel have evolved, ushering in a new era of tourism that emphasizes local experiences and personalized services (Kim et al., 2025). Among the key players in this transformative landscape are receptive travel agencies, pivotal entities that bridge the gap between international visitors and local destinations (Liu, 2024). These agencies not only facilitate travel arrangements but also provide in-depth knowledge and insights that enhance the overall travel experience (Moll-De-Alba et al., 2016; Jocić et al., 2024). Receptive travel agencies are specialized entities that act as intermediaries between international tourists and local service providers (Ho et al., 2024). They are characterized by their profound understanding of the destination's culture, attractions, and logistical nuances, which allows them to curate tailored experiences for visitors (Choi & Hyun, 2022).

Typically, these agencies offer a wide range of services, including itinerary planning, accommodation booking, transportation arrangements, and guided tours (Vujko et al., 2017). According to MacKenzie & Dominic (2023), a receptive agency in Thailand might provide not only standard hotel accommodations but also unique experiences such as cooking classes with local chefs or guided tours through hidden temples. By focusing on the needs of international travelers, these agencies enhance the visitor experience, ensuring that tourists engage deeply with the local environment (Hossain et al., 2024). According to (Allan, 2025), receptive travel agencies play a vital role in facilitating seamless travel for international visitors by handling the complexities of language barriers and local customs. They often provide crucial support in navigating the intricacies of a new environment, thus allowing travelers to immerse themselves fully in the local culture without the stress of logistical challenges (Demirović et al., 2020).

One of the standout features of receptive travel agencies is their unmatched local knowledge and expertise, which significantly enriches the travel experience (Pebrianto et al., 2024). These agencies are equipped with insights that only locals possess, such as hidden gems, cultural practices, and off-the-beaten-path attractions that mainstream tourist guides

* Corresponding author

may overlook (Yeboah & Ashie, 2024). According to Nesto & Di Savino (2016), a receptive agency operating in Italy might recommend a lesser-known vineyard in Tuscany that offers authentic wine tastings away from the usual tourist traps, providing visitors with a genuine taste of local life. Moreover, the partnerships that receptive agencies cultivate with local businesses, artisans, and tour operators further enhance the quality of the experience for travelers (Gubarenko et al., 2020). These collaborations not only benefit the visitors but also promote sustainable tourism practices by supporting local economies and preserving cultural heritage (Addai et al., 20244).

Receptive agencies often advocate for responsible travel, encouraging visitors to engage in eco-friendly activities or community-based tourism initiatives (López-Sanz et al., 2021). This commitment to sustainability not only enriches the travel experience but also fosters a deeper connection between tourists and the destinations they visit, ultimately leading to a more responsible form of tourism that respects and honors local traditions (Rainero et al., 2020).

By attracting visitors to rural-spa areas, these agencies help enhance local economies through increased tourism revenue. According to Knežević et al. (2024), every dollar spent by a tourist generates an additional 1.5 dollars in the local economy, underscoring the multiplier effect of tourism. This influx of revenue can be pivotal for rural communities, providing funds for infrastructure development and public services. Moreover, receptive travel agencies contribute to job creation and skill development in these regions (Rajpal, 2024). As tourism expands, there is a growing need for trained professionals in hospitality, spa services, and tour guiding, leading to the establishment of training programs that empower local residents (dos Santos et al., 2024; Gautam & Bhalla, 2024). Additionally, these agencies often prioritize partnerships with local artisans and service providers, ensuring that the economic benefits of tourism are distributed within the community (Lapuz, 2023). By fostering a symbiotic relationship between tourism and local culture, receptive travel agencies not only enhance the visitor experience but also help preserve the unique heritage of rural destinations (Vujko et al., 2024). By engaging stakeholders in the planning process and emphasizing the shared benefits of sustainable tourism, these agencies can help mitigate resistance and promote a more inclusive approach to destination development.

The need of tourists for an authentic and remarkable environment has created a new form of tourism. This has opened opportunities for the development of many rural spa destinations that previously did not attract a large number of foreign visitors. It is evident that spa destinations that embrace and recognize these changes have a competitive advantage in the tourism market. According to Arsić et al. (2024a), rural-spa tourism is developing as a result of the specific demands of tourists, and consequently research has been conducted to understand the motives behind their visits and the way they choose certain destinations. There are various reasons why tourists visit rural spa areas, leading to different types of tourism in these regions. Rural tourism is a key factor in the revitalization of spas, and its development plays a crucial role in addressing the economic and demographic challenges faced by the local population (Joppe, 2010).

The main stakeholders in the development of spa destinations are the local population, as well as the private and public sectors (Arsić et al., 2024b). Their engagement and motivation can significantly influence the promotion of a tourist destination (González-Rodríguez et al., 2023). Receptive travel agencies play a pivotal role in this paradigm, acting as intermediaries that promote sustainable rural-spa destinations. These agencies facilitate the integration of eco-friendly practices, foster stakeholder collaboration, and face the challenges of balancing economic growth with environmental conservation. In Serbia, there are over 1,100 travel agencies, but the majority are outbound-oriented, while only a few focus on inbound tourism (Ilić, 2024). The initial hypothesis (H) states that receptive travel agencies play a crucial role in promoting destinations and attracting foreign tourists. The aim of this research is to determine the role of these agencies in promoting sustainable rural-spa tourism and their significance for the sustainable development of tourist destinations in Serbia.

The research highlighted four key factors influencing tourists' choices regarding receptive travel agencies: unique experiences, immediate involvement, getting to know the destination, and mediation. These factors significantly impact tourist satisfaction and loyalty, emphasizing the role of receptive travel agencies in promoting sustainable development by aligning tourism activities with environmental, economic, and social sustainability practices.

Mediation plays a key role in improving the tourist experience in Sokobanja by addressing the cultural, social and informational gaps between tourists and their destinations. The local tourism agency, which employs 50 people, cooperates with the Bulgarian agency to attract foreign tourists, especially during the winter season, and has identified active recreation as the primary motive for visits. Despite a drop in revenue during the Covid pandemic, the agency has seen a resurgence in tourist arrivals, especially foreign visitors, and aims to diversify its offering to sustain business growth while facing challenges related to seasonal fluctuations in demand and increased operating costs.

Receptive Travel agencies and their role in promoting sustainable rural-spa tourism

Receptive travel agencies are an important tool for promoting local culture, enhancing the attractiveness of tourist destinations, and contributing to the positive development of local businesses and the environment (Page, 2011). Their role in sustainable tourism is reflected in the implementation of policies that promote all principles of sustainability (Chen et al., 2025). Receptive agencies, especially in the context of tourism, play a key role in facilitating travel by acting as intermediaries between foreign travel agencies and local service providers (Deng & Athanasopoulos, 2011). They are responsible for ensuring that tourists receive the services promised in travel packages while managing the logistics and quality thereof (Wang et al., 2024). By focusing on the destination and tourist satisfaction, they influence tourist behavior at the destination, which is often the biggest challenge in preserving natural sites. These types of agencies are beneficial in terms of the economic and social status of the local population, as they help create jobs and play a crucial role in bridging the gap between local tourism services and international tourists (Inmor et al., 2025). Receptive travel agencies contractually guarantee the provision of high-quality services to tourists. They manage the expectations of foreign travel agencies and ensure that the services provided meet the agreed-upon standards. They utilize digital marketing strategies to expand their reach and are increasingly focusing on sustainable tourism practices (Da Silva et al., 2024). According to Buhalis & Ujma (2006) their role as intermediaries requires them to adhere to high standards and fulfill all their contractual obligations.

According to Montenegro (2015) receptive agencies are increasingly using digital marketing strategies to promote tourism products. His study, which focuses on agencies in Praia da Pipa, Brazil, highlights the importance of digital presence and the effectiveness of marketing strategies on platforms such as Instagram. Receptive agencies face challenges such as maintaining service quality and adapting to digital transformations in the tourism industry (Talwar et al., 2020).

The coexistence of traditional and online distribution channels suggests that agencies must balance both to meet the diverse preferences of consumers (Law et al., 2004). As the industry evolves, receptive agencies must continue to innovate and adapt to changing consumer behavior and technological advancements. In the digital era, social media has become an essential tool for promoting tourism destinations. Given the changes in the needs and behavior of modern tourists, integrating social media into promotional strategies is one of the key prerequisites for the successful development of tourism destinations (Podovac, et al., 2019). Breitsohl & Garrod (2016) highlight the growing interest in sustainable tourism within the inbound market, particularly in the United States. A feasibility study for a virtual travel agency specializing in sustainable tourism indicates market demand for environmentally friendly travel options.

According to these authors, there is a noticeable shift toward more responsible tourism practices that consider both environmental and social impacts. Rural tourism in the Gurghiu Valley, Romania, can preserve local uniqueness and contribute to sustainable socio-economic development when local entrepreneurs engage in new practices and sustainable approaches (Crăciun et al., 2022). Žunić (2016) emphasizes the importance of hospitality and the quality of tourist experiences as key cultural factors influencing the attractiveness and sustainable development of tourism in Sarajevo.

The challenges faced by receptive travel agencies relate to the quality of service they provide and managing customer expectations. As the tourism industry develops, these agencies are adapting to new marketing strategies and technological advancements to remain competitive. In Serbia, agencies rarely opt for operating solely through receptive tourism (Stanić et al., 2022). The reason for this is insufficient support from the state and lower profit margins, so agencies operating in the Serbian market are mostly outbound-oriented. The overall content of their operations largely depends on the characteristics of the tourist market they serve (Dramićanin, 2019).

Spasić (2011) notes that receptive agencies in tourist destinations, in addition to their regular operations, engage in selling tickets for cultural events, making accommodation reservations, selling maps and postcards, offering souvenirs, and providing currency exchange services. It is evident that receptive agencies operating in tourist areas have been influenced by various factors, and they have undergone numerous changes in their business orientation, evolving from representatives or agents of tour operators. One of the better examples in Serbia is the association of receptive agencies (URA), which was founded in 2019 with the goal of positively influencing legal regulations in the country and improving the treatment of this type of travel agency in Serbia. The association includes 25 tour operators whose primary activity is receptive tourism (Ilić, 2023).

MATERIALS AND METHODS

The research consisted of two parts. The first part referred to a survey among 318 foreigners who visited Sokobanja in the period from March 2024 to October 2024. The authors visited the destination on several occasions and surveyed foreign visitors. The second part of the research was desk research, as well as the interview technique with employees of the Tourist Organization of Sokobanja and the owner and employees of the travel agencies for receptive business, "DM" in Sokobanja. These stakeholders were able to see their statistical data on the number of overnight stays by foreign tourists, the offer, the services they provide to tourists and the trips they organize. Initial hypothesis H states that travel agencies with a receptive character are an important link in the promotion of the destination and the attraction of foreign tourists. The goal of this research is to determine the role of these agencies in the promotion of sustainable rural spa tourism and the significance that such agencies have for the sustainable development of tourist destinations in Serbia.

In our research paper, we adopted a **interpretivist epistemological approach.** The theoretical framework of interpretivist epistemology is grounded in the belief that knowledge is constructed through social interactions and subjective experiences. Unlike positivist approaches that prioritize quantifiable data and objective truths, interpretivism seeks to understand the meanings individuals assign to their experiences. This epistemological stance is particularly relevant in tourism research, where human interactions, cultural exchanges, and individual perceptions significantly shape the tourism experience. The Sokobanja study employed interpretivism to attain a more profound comprehension of the experiences of tourists, yielding nuanced insights into the ways in which motives affect sustainable practices. By concentrating on subjective understanding, interpretivism enables researchers to investigate the motivations, beliefs, and values that direct both individuals and organizations toward sustainable development. This focus on context and meaning is essential within the tourism industry, where the varied expectations of stakeholders necessitate a comprehensive understanding of human behavior.

In order to verify the initial hypothesis of the paper, it was necessary to provide answers to two questions:

- Why is it important that there are receptive travel agencies in tourist places? and
- What do receptive travel agencies mean for tourist destinations?

In order to answer these questions, it was necessary to set the sub-hypotheses of the paper:

- Sub-hypothesis h1 - Receptive travel agencies enable tourists to get to know the destination better and create positive impressions that influence the positioning of the tourist destination;
- Sub-hypothesis - Receptive travel agencies contribute financially to the strengthening and development of the tourist destination.

The subsequent task required was the execution of factor analysis, which identified four distinct factors. Specifically, between March and September 2024, tourists were presented with a set of 30 questions that necessitated ranking on a five-point Likert scale. Upon analyzing the collected data, the categorized responses highlighted the following four factors as particularly representative: Unique Experience, Immediate Involvement, Getting to Know, and Mediation.

- **Factor 1.** Unique experience

v4 They possess an in-depth knowledge of local culture, attractions, and logistics that is difficult to replicate.

v16 They create opportunities for immersive activities, such as participating in traditional cooking classes or local festivals

- **Factor 2.** Immediate Involvement

v1 Their financial savvy, combined with their extensive knowledge of the area, allows travelers to enjoy a richer experience without breaking the bank

v6 They offer travelers an unparalleled opportunity to engage deeply with their chosen destinations.

v9 They are suggesting the best times to visit to avoid crowds.

v11 The ability to adapt to individual desires and needs exemplifies the expertise of receptive travel agencies

- **Factor 3.** Getting to know

v2 Their partnerships with local vendors often translate to cost-effective options, as they can negotiate better rates that are unavailable to individual travelers.

v7 Receptive travel agencies enable travelers to not only visit a place but to truly know it.

v12 They are invaluable partners in crafting memorable journeys

v17 They allow travelers to appreciate the destination's history and traditions in a way that mere observation cannot achieve.

- **Factor 4.** Mediation

v10 These agencies maintain strong relationships with local service providers, such as hotels, restaurants, and tour operators, which ensures that travelers receive the best services and insider access.

v14 They often provide access to off-the-beaten-path destinations and hidden gems that are typically overlooked in mainstream travel guides

v15 These agencies also facilitate authentic interactions with local communities, promoting cultural exchanges that enrich both the traveler's experience and the lives of the residents.

v20 They significantly enhance the overall travel planning process. After factor extraction, this study applied Structural Equation Modeling (SEM), a methodology of multivariate analysis of causal relationships among variables based on a structural model that interprets the path coefficients as indicators of strength of relationship clarifies how dependent data are related. SEM is a powerful tool capable of handling multicollinearity, which would be created in case three of the independent variables selected showed a high degree of correlation. An important advantage of SEM over multiregression and factor analysis is that every element of SEM should be justified by theory and, accordingly, the building-up and modification of models depend much more on the theory. A significant misuse of SEM happens when data is just modified to fit an appropriate SEM. This can result in a build-up of the theory based only on the findings from the analysis.

Rural-spa destination Sokobanja

Sokobanja is a standout tourist destination in the Pomoravlje region (Nikolić & Stanković, 2008). The issuance of a tourist voucher on June 8, 1837, marked a turning point for Sokobanja and the beginning of organized tourism. The tourism services provided have evolved over the years. The destination developed from a spa and rehabilitation center to a recreational and sports hub, and today, it is a wellness and spa tourist destination. Sokobanja has resisted changes, crises, wars, transitions, and new trends for years. The mineral springs under Ozren were used by the Romans and Turks (Stanković, 2012). From 1933 to 1939, Sokobanja was visited by a significant number of guests, ranking second among the spa centers in Serbia at that time (Arsić et al., 2024a). Sokobanja is located in eastern Serbia, on both sides of the Moravica River, in a vast basin with gently rolling terrain, nestled between the mountains of Rtanj, Ozren, Devica, Slemen, and Bukovik (Stanković, 2009). The favorable traffic-geographical position is enhanced by its proximity to the E75 highway, just 30 km away. Sokobanja is rich in archaeological, monumental, and ethnographic tourist values, all of which are significant for the development of tourism.

The most significant anthropogenic attractions in Sokobanja include Sokograd, the remains of the archaeological site Trebič, the Amam bath, the Monastery of St. Archangel, the residence of Prince Miloš, the Latin Town, and the Sesalac Cave. The development of tourism has been facilitated by the presence of numerous thermo-mineral springs, the climate, the mountainous surroundings of Rtanj and Ozren, as well as the location of the town in a basin. The canyons, caves, Bovan Lake, Lake Vrmdža, and the Moravica River contribute to the value of this destination and form the base for tourism development in this area, making these natural resources the primary tourist assets of the region (Arsić et al., 2024b). Thermo-mineral springs are found along the Moravica River and at the foothills of the Ozren and Devica mountains. Their temperatures range from 22 to 46.5°C. These springs are located at six sites, where they have been captured and transformed into modern baths. Some of the thermal springs include Park Bath, Preobraženje Spring, Banjica I and Banjica II, Lemon Spa, and the springs in the village of Jošanica. The thermo-mineral water is used for medicinal purposes, suitable for drinking, inhalation, and bathing. It is also used to treat various diseases as well as for their prevention. The richness of the air, with negative ions, contributes to the general well-being of the body and promotes quick recovery from various ailments, particularly respiratory issues and stress, which are prevalent in today's world (Milenković, 2011).

Tourists receive information about excursions from the tourist organization, local residents, and smaller receptive agencies. They can provide recommendations for routes, tour guides, or group excursions. With the help of printed itineraries based on daily planners classified by location, tourists can independently explore both anthropogenic and natural attractions. The first destination is Mount Ozren, where visitors can see the Ripaljka Waterfall, the natural lake Mala Ripaljka, and the Jezerce restaurant. For those seeking more activity, a suggested walking tour is to the medieval Jermenčić Monastery. Other suggestions include visiting the Kalinovica Park and the Barudžija spring, as well as the "Love Stone," where, according to legend, Hajduk Veljko and Čučuk Stana would meet, and dining at the traditional restaurant Kalinovica. The second route is to Mount Rtanj, including a visit to the village of Vrmdža, the ancient Latin Town, a stop at Lake Vrmdža, and a break at "Naša Vodenica," which produces homemade flour ground in the traditional way, with an opportunity to learn about the craft. The next stop is the foothills of Mount Rtanj, with a hike to the summit, lasting about three hours, for those who are adventurous. Visitors can also explore the remains of the St. George's Chapel.

For others, the suggested visit is to the Ledenica Cave. The final recommendation is "Tomićeva Koliba," an ethno-restaurant with a view of Mount Rtanj. The third route includes a visit to Župan Beach on the Moravica River, a tour of the Lepterija picnic area, the Church of the Holy Mother of God, which dates back to the 12th century, and Hajduk Veljko's Cave. For those interested in more dynamic experiences, the suggestion is a hike to Sokograd, followed by a relaxing break at the "Pećina" restaurant, which can be reached along the Moravica Riverbank. The fourth route includes a visit to the source of the Moravica River, Vrelo, and the Čitluk Cave. After that, the tour continues to the village of Seselac and the Seselac Cave, where visitors can take a short break and enjoy the specialties prepared by the locals. The itinerary then leads tourists to the northern side of Mount Rtanj, to visit the ancient spring of Vrelo, believed to be a bioenergy source.

At this location, visitors can also explore the Rtanj traditional household, which offers homemade teas made from medicinal herbs found on the mountain. This mini itinerary includes detailed descriptions of these sites, but it is only printed in Serbian and there are no digital versions or ways for tourists to learn about the excursions electronically.

Table 1. Total variance explained

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	3.588	23.918	23.918	1.770	11.803	11.803	3.098	20.656	20.656
2	3.372	22.478	46.396	3.137	20.914	32.717	2.948	19.650	40.306
3	2.684	17.891	64.287	3.028	20.188	52.904	2.746	18.304	58.610
4	1.891	12.605	76.891	1.485	9.902	62.806	1.674	11.160	69.770
5	1.087	7.248	84.139	2.030	13.532	76.338	.985	6.568	76.338
6	.484	3.225	87.364						
7	.384	2.559	89.923						
8	.333	2.218	92.141						
9	.302	2.013	94.154						
10	.229	1.528	95.682						
11	.216	1.441	97.123						
12	.175	1.169	98.292						
13	.132	.880	99.172						
14	.082	.543	99.715						
15	.043	.285	100.000						

RESULTS AND DISCUSSION

The study involved 318 foreign tourists who visited Sokobanja, with the following distribution: the highest number of foreign tourists came from Romania (13.2%), Montenegro (12.9%), Ukraine (11%), Croatia (10.7%), and from Bulgaria and Austria (both 10.1%). A smaller percentage of foreign tourists came from Hungary, France, North Macedonia, and Greece. Approximately 66% of foreign tourists come from countries bordering the Republic of Serbia. The data obtained from the Sokobanja Tourist Organization confirms this with statistics on travel routes, where 75% of arrivals are by car, 20% by bus, and 5% by plane. Tourists choose this destination because of its good connectivity with tourist demand centers and international travel routes in this part of Europe. Isolated responses show the main factors for four groups of answers from respondents regarding the posed questions. Tables 1 and 2 present the results of the factor analysis. In this manner, a model was obtained that groups the variables into four factors explaining a total of 76,892% of the variance.

Factor 1. Unique experience: Leveraging local expertise through knowledgeable guides is fundamental in crafting immersive cultural experiences that resonate deeply with travelers. These guides, equipped with a profound understanding of their destinations, provide essential insights into local culture, history, and customs, thereby enhancing the authenticity of the travel experience. A significant aspect of their role is community engagement, which is crucial for designing meaningful activities that reflect the true essence of the locale. For instance, guides can lead cooking classes that not only teach travelers about local culinary practices but also foster connections with the chefs and local ingredients, creating a richer understanding of the culture. Additionally, participating in cultural events or volunteering within the community allows travelers to delve deeper into local traditions and customs, further enriching their journey. This engagement with local expertise not only enhances the travel experience but also enables the formation of lasting connections between tourists and the communities they visit, promoting mutual understanding and respect. As a result, knowledgeable guides serve as vital conduits for authentic experiences, facilitating activities that allow travelers to explore off-the-beaten-path destinations and interact with locals in meaningful ways. Ultimately, their expertise is instrumental in ensuring that travelers leave with unforgettable memories and a deeper appreciation for the cultures they encounter.

Factor 2. Immediate Involvement: In the evolving landscape of travel, immediate involvement has emerged as a pivotal factor in enriching travelers' experiences. As the demand for immersive experiences continues to rise, travel industry players have an opportunity to cater to this desire by providing engaging activities that connect travelers with their destinations on a deeper level. One effective strategy is to focus on optimal visit timing, which can significantly influence the quality of the travel experience. For instance, visiting attractions during off-peak hours may lead to a more enjoyable and less crowded experience, allowing travelers to fully appreciate their surroundings and engage with local culture. Furthermore, cost-effective opportunities that promote deeper engagement are increasingly prevalent, enabling travelers to participate in unique experiences without breaking the bank, such as local workshops or community events. Additionally, the implementation of personalized adaptability in travel offerings can transform a standard trip into a tailored adventure, ensuring that travelers can make choices that resonate with their interests and preferences. This level of customization not only enhances satisfaction but also fosters a sense of connection with the destination. By leveraging these strategies, the travel industry can create more fulfilling and memorable journeys that resonate with the modern traveler’s quest for meaningful engagement.

Factor 3. Getting to know: Leveraging partnerships with local vendors through receptive travel agencies can significantly enhance traveler experiences while simultaneously providing cost-effective travel options. Receptive travel agencies possess a unique negotiating power that enables them to secure favorable rates on venues, services, and logistics, which can lead to substantial cost savings for travelers. This ability to negotiate effectively stems from their established relationships with local vendors, which not only allows for better pricing but also minimizes last-minute issues that can disrupt travel plans. Furthermore, the expertise of receptive travel agencies in travel planning contributes to streamlined processes, saving valuable time for both travel organizers and participants, ultimately enhancing the overall traveler experience. Their in-depth local knowledge equips them to offer insights into the best options available, from accommodations to dining and activities, ensuring that travelers appreciate the local culture and environment more deeply. By integrating local vendors into travel plans, receptive travel agencies foster an enriching experience that goes beyond the surface, allowing travelers to connect with the essence of their destination while enjoying the benefits of reduced costs.

Factor 4. Mediation: Receptive travel agencies are pivotal in creating enriching experiences for travelers by establishing robust partnerships with local service providers. By fostering these connections, agencies can facilitate access to quality services that reflect the authentic culture and offerings of the community, thus enhancing the overall traveler experience. Engaging with local communities in a meaningful way not only helps build strong partnerships but also enriches the travel experience through cultural immersion and genuine interactions. For instance, when receptive travel agencies collaborate with local tour operators, they can curate unique and immersive experiences that go beyond typical tourist attractions, allowing travelers to connect more deeply with the destination. This collaboration is essential, as it creates comprehensive travel packages tailored to diverse interests and preferences, making trips more attractive and engaging for potential customers. Additionally, the networks that established travel agencies maintain with local businesses, accommodations, and attractions can lead to exclusive access and better deals for travelers, further enhancing their experience. Thus, through effective partnership building and authentic community engagement, receptive travel agencies unlock the full potential of the tourism industry, resulting in a travel experience that is not only enjoyable but also respectful and enriching for both visitors and the local community.

Table 2. Factor matrix

	Factor				
	1	2	3	4	5
v1	.046	.996	.037	-.003	.000
v6	.049	.733	.006	.525	-.099
v11	-.012	.882	.006	.088	-.074
v9	.074	.863	.077	-.110	.011
v2	-.093	-.026	.971	-.187	.048
v7	-.122	-.104	.881	.403	-.129
v12	-.053	-.188	.693	.267	-.156
v17	.071	-.107	.839	-.161	.083
v5	-.031	-.036	.120	.290	.635
v10	.129	.033	.058	.450	.743
v14	.442	.121	-.226	.383	-.242
v15	.055	-.015	.080	.505	.661
v20	.147	.038	.158	.453	.709
v4	.999	-.011	.014	.000	-.001
v16	.702	-.096	.130	-.031	.096

Structural Equation Modeling (SEM), as illustrated by the representative graph, reveals the interdependence of the identified factors, both in relation to one another and with distinct isolated attitudes. Tourist experiences positively influence tourist satisfaction and loyalty, forming the core of motivation and satisfaction for travelers in tourist destinations. Experiences, which include excursions, food, culture, history, and the environment, significantly affect consumers' decisions about choosing a destination for their vacation. When integrated into a whole, these experiences encourage the sustainable development of rural spa tourism. The research suggests that unique experiences significantly impact the choice of destination, satisfaction, and loyalty of tourists, which are built through authentic and unforgettable guidance provided by tourist workers at the destination. The interdependence of four indicators, such as unique experience, direct involvement, learning, and mediation, positively affects tourists' psycho-physical state, creating a sense of loyalty toward the tourist destination. The results showed numerous positive influences between the factors. Receptive travel agencies play a vital role in promoting sustainable development in rural spa destinations by managing tourism activities that are in line with environmental, economic and social sustainability. By implementing strategies such as promoting environmentally friendly practices, supporting local economies and preserving cultural heritage, these agencies can improve the overall sustainability of rural spa destinations. In Table 3 we see the influences that the factors have on each other. A minus sign indicates potentially negative impacts. In the context of sustainable development of a rural spa destination, SEM can help identify key factors and variables that contribute to sustainability and how they interact.

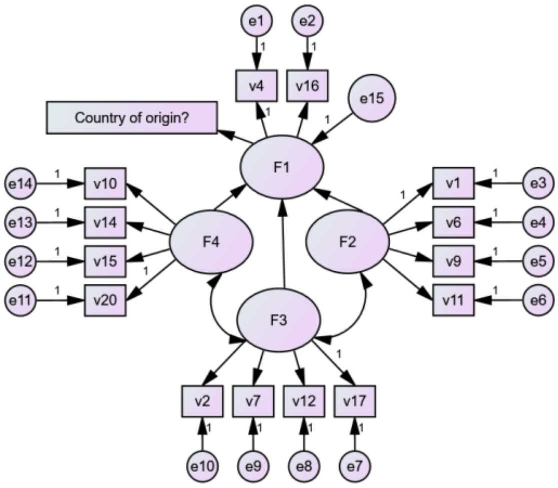

Figure 1. Structural Equation Modeling (SEM) (Source: Prepared by the authors (2024)

As illustrated in Figure 1 and Table 3, the following specific strategies are recommended for receptive travel agencies: **Promote environmentally friendly practices**: (Encourage the adoption of sustainable accommodation and services, e.g., v1, v10; Implement and advocate for sustainable transportation options, e.g., v3, v4); **Increase economic benefits:** (Provide support for local businesses and enhance employment opportunities, e.g., v2, v12, Develop and promote local products and experiences, e.g., v5, v6); **Preserve socio-cultural aspects:** (Promote cultural heritage and traditions, e.g., v13, v17, Engage with local communities to ensure that tourism development aligns with their needs and values, e.g., v7, v8); **Monitor and evaluate:** (Continuously assess the impact of tourism activities on sustainability indicators, e.g., v9, v11, v14, Utilize feedback and data to inform decisions and adapt tourism strategies accordingly, e.g., v15, v16, v18, v19, v20). This answers the question Why is it important that there are receptive travel agencies in tourist places? Which confirmed Sub-hypothesis h1 that Receptive travel agencies enable tourists to get to know the destination better and create positive impressions that influence the positioning of the tourist destination.

Table 3. Standardized regression weights: (Group number 1 - Default model)

			Estimate				Estimate
F1	<---	F3	6.100	v17	<---	F3	.932
F1	<---	F4	-.593	v12	<---	F3	.854
F1	<---	F2	6.485	v7	<---	F3	.978
v4	<---	F1	.138	v2	<---	F3	.993
v16	<---	F1	.076	v12	<---	F4	.866
v1	<---	F2	.131	v15	<---	F4	.932
v6	<---	F2	.005	v14	<---	F4	-.012
v9	<---	F2	.114	v10	<---	F4	.862
v11	<---	F2	.050	Country	<---	F1	1.000

Receptive agency business of Sokobanja

In the tourism development program of Sokobanja, the number of people employed in tourism in Sokobanja is 3,000. Of that, 50 are employed in agencies. The agency "DM" from Sokobanja is part of the research, has a receptive business model, and has been operating in the Sokobanja area since 2005. Their branch has 4 employees, and the scope of their business, in addition to "travel services," includes guest reception, accommodation reservations, mediation in bookings, mediation in tourist travel abroad, exchange services, insurance, and information services. In collaboration with a Bulgarian travel agency, the agency organizes the arrival of foreign tourists during the winter season. To form a quality service program and tailor it to the needs and desires of tourists, this agency works with the Tourist Organization through joint appearances at fairs and similar activities. In a study conducted in cooperation between these two organizations, five different motives for tourist visits were isolated. Visitors mainly come to Sokobanja for recreational activities (Table 4). From this stance, we can conclude that receptive agencies can ensure the sustainability of their business in the future by organizing excursions and mediating access to certain attractions. The review of the balance sheet of the "DM" agency revealed that total revenues, according to account 1043, were the lowest during and after the Covid-19 pandemic (Table 5). The most successful year was 2022, where the majority of revenue was generated from issuing accommodation vouchers. Given the decline in 2023, additional sources of income should be sought in organizing excursions and creating new offers.

According to data from the TIC of the TO Sokobanja, the results of the annual survey conducted in 2024, with a sample of 1,217 tourists (both domestic and foreign), determined the average spending of tourists in Sokobanja. Foreign tourists who stayed during 2024 spent an average of about 80 € per day. More than half of this amount (44 € or 55%) was for accommodation costs, 17 € or 21% for restaurant services, whether in restaurants, bars, or fast food, 9.5 € or 12% was spent on shopping (souvenirs and local products, market), 4 € or 5% on local transportation (taxis, organized transportation in the area), while about 5.5 € or 7% of total spending covered all other services at the destination, such as culture, entertainment, sports, recreation (aquapark), organized excursions, and more. From the obtained data, we can conclude that foreign tourists tend to spend on excursions and other activities, which creates business opportunities for receptive tourism agencies.

Table 4. Reasons for visiting in 2023/2024
(Source: Tourist Organization Sokobanja, January 2025)

Five reasons why tourists visit Sokobanja
Recreational and sports activity holidays
Relaxation, spa, and rehabilitation
Sports facilities and events
Events; Traditional food and specialties

Table 5. Profit and loss statement account 1043 - Year 2020/21/22/23
(Source: Tourist Agency "DM" Sokobanja, January 2025)

Year	Total revenue
2020	5.344.000,00 RSD
2021	4.502.000,00 RSD
2022	11.551.000,00 RSD
2023	7.315.000,00 RSD

Table 6. The number of tourist arrivals from 2020 until 2024 (Source: Tourist Organization Sokobanja, January 2025)

Year	Visitors	JAN, FEB, MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV, DEC	Total
2020	Domestic	8223	**572**	**4232**	16545	20879	29010	22622	14024	6474	**120428**
	Foreign	1145	**0**	**24**	66	173	397	279	160	170	**2414**
	Total	**9368**	**572**	**4256**	**16611**	**21052**	**29407**	**22901**	**14184**	**6647**	**122842**
2021	Domestic	14074	8398	14066	17736	26187	32624	20810	11193	9727	**154815**
	Foreign	460	208	383	459	814	620	449	452	471	**4316**
	Total	**14534**	**8606**	**14449**	**18195**	**27001**	**33244**	**21259**	**11645**	**10198**	**159131**
2022	Domestic	14586	9241	10435	12019	18759	31951	25607	18812	12610	**154020**
	Foreign	702	806	421	346	638	573	528	831	1644	**6489**
	Total	**15288**	**10047**	**10856**	**12365**	**19397**	**32524**	**26135**	**19643**	**14254**	**160509**
2023	Domestic	15886	9399	9076	11649	23583	27749	19316	11531	8999	**137188**
	Foreign	2593	1593	838	558	924	921	664	955	2673	**11719**
	Total	**18478**	**10992**	**9914**	**12207**	**24507**	**28670**	**19980**	**12486**	**11672**	**148907**
2024	Domestic	17029	7785	10152	10969	14312	18001	9993	5849	8774	**102864**
	Foreign	2936	804	1193	540	873	1353	987	1261	2551	**12498**
	Total	**19965**	**8589**	**11345**	**11509**	**15185**	**19354**	**10980**	**7110**	**11325**	**115362**

According to Baum & Lundtorp (2001), the impact of seasonal variations in demand is one of the dominant policy and operational concerns in tourism for both the public and private sectors. There are few destinations where demand does not fluctuate in accordance with clearly defined seasonal patterns. Regarding seasonality, in the 1970s and 1980s, Sokobanja had an intense twelve-month business operation. Today, tourists visit Sokobanja mainly during the summer, and the season lasts from April to October. The highest number of overnight stays was recorded in 1986, with 840,484 stays, after which this number drastically declined (Arsić et al., 2024a). Table 6 shows the number of arrivals from 2020 to 2024, where we observe an increase in the number of tourists following the COVID-19 pandemic. The highest number was recorded in 2023, with approximately 11,000 visitors. The analysis of the table shows a constant growth in foreign arrivals compared to previous years, particularly in relation to 2020. In 2024, Sokobanja was unable to maintain the level of demand and achieve similar results as in previous years for both domestic and foreign tourists. The most significant decline was observed during the summer, even though the number of foreign arrivals remained stable. The total number of recorded arrivals in 2024 was 22.5% lower compared to 2023. The number of overnight stays is influenced by a complex interaction of economic conditions, types of accommodation, tourist demographics, and regional trends. Understanding these factors can help in formulating effective tourism development strategies and efficiently managing tourist demand (Moll et al., 2016).

A similar number of overnight stays was recorded in the accommodation facilities in Sokobanja during 2021 and 2022. In the following years, the average number of overnight stays was around 650,000, leading to the conclusion that Sokobanja maintains stable operations without significant fluctuations in the number of tourists. The current situation indicates that Sokobanja remains an attractive destination, drawing a large number of tourists. In Tables 6 and 7, significant fluctuations are observed due to the state of emergency caused by the COVID-19 pandemic, as well as natural disasters such as heavy rains and floods. In the first eleven months of 2024, the average number of overnight stays for domestic tourists was 4.5, while for foreign tourists, it was 2.8. According to tourism sector employees, an increase in taxes and tourist fees—resulting from the reclassification of Sokobanja from a Category 4 to a Category 1 tourist destination—has contributed to this negative trend. Consequently, the classification was revoked for 4,000 registered beds, leading to a decline in the total number of overnight stays. By the end of December, the total number of overnight stays in 2024 had dropped by approximately 163,000, a decrease of around 25%. The only increase observed in 2024 was in the number of foreign overnight stays, which was 6.6% higher than in any of the previous four years.

Data obtained from the Sokobanja Tourist Information Center show that foreign tourists visiting Sokobanja primarily come for Mount Rtanj. Some of them go hiking to the summit, while others explore the bioenergetic fields at the mountain's base. Other popular excursions include Sokograd and the Lepterija picnic area, located along the Moravica River. The third most visited site is the village of Vrmdža and its lake, where tourists also could attend cooking classes and participate in food preparation. Additionally, the Ozren Mountain picnic area is a key attraction, along with Ripaljka Waterfall, which holds historical significance as Serbia's first officially registered natural monument, designated in 1949.

Table 7. The number of overnight stays from 2020 until 2024 (Source: Tourist Organization Sokobanja, January 2025)

Year	Visitors	JAN, FEB, MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV, DEC	Total
2020	Domestic	34288	**2874**	**24381**	83932	11551	16123	12725	66307	26757	**642568**
	Foreign	2680	**0**	**98**	145	607	1048	786	336	552	**6252**
	Total	**36968**	**2874**	**24479**	**84077**	**11618**	**16231**	**12801**	**66643**	**27309**	**648820**
2021	Domestic	52669	36128	65921	87677	13510	16444	10527	60233	35448	**743017**
	Foreign	1288	465	995	1380	2969	2236	1357	1208	1174	**13072**
	Total	**53957**	**36593**	**66916**	**89057**	**13819**	**16670**	**10664**	**61441**	**36622**	**756089**
2022	Domestic	50044	35204	47320	59399	93566	16981	13950	99788	54798	**749430**
	Foreign	1802	1859	1317	1239	2397	2264	1759	1926	3732	**18295**
	Total	**51846**	**37063**	**48637**	**60638**	**95963**	**17205**	**14129**	**10174**	**58530**	**767725**
2023	Domestic	55881	35284	42188	55930	11312	13763	97474	54134	32450	**624176**
	Foreign	6842	3981	2559	1879	2887	3944	2021	2479	5721	**32313**
	Total	**62723**	**39265**	**44747**	**57809**	**11609**	**14157**	**99495**	**56613**	**38171**	**656489**
2024	Domestic	57615	31571	47479	54890	69706	87916	51094	26342	33578	**460191**
	Foreign	7869	1803	2937	1705	2813	4641	2494	3238	5850	**33350**
	Total	**65484**	**33374**	**50416**	**56595**	**72519**	**92557**	**53588**	**29584**	**39428**	**493545**

In recent years, with changing travel motivations, some tourists seeking an adventurous vacation have started visiting the water park. This excursion is particularly popular among younger visitors. Chen et al. (2014) state that local tourist agencies play a significant role in shaping tourist flows by creating itineraries and providing information, which can impact the occupancy and sustainability of destinations. According to Rizal & Baizal (2023), in Indonesia, these practices are used to manage tourist flows and identify optimal routes. Efficient itinerary design allows travel agencies to offer more personalized and diverse routes, addressing the lack of individuality in traditional itineraries. This answers the question: What do receptive travel agencies mean for tourist destinations? This confirms Sub-hypothesis h2 that Receptive travel agencies contribute financially to the strengthening and development of the tourist destination.

CONCLUSION

Receptive travel agencies are important in tourist destinations because they enhance the visitor experience, provide local expertise, facilitate logistics and support the local economy. This travel agencies play a key role in the tourism ecosystem for several reasons: 1. Enhancing the visitor experience: These agencies specialize in understanding the needs and preferences of tourists. They offer customized services such as guided tours, transportation arrangements and accommodation reservations that specifically cater to the interests of visitors. This personalized approach helps tourists have an unforgettable and enjoyable experience. 2. Local Expertise: Inbound travel agencies possess extensive knowledge of the local culture, attractions and hidden gems of the destination. They can provide insights that tourists may not find in guidebooks or online resources. This local expertise allows them to recommend activities and locations that align with tourists' interests, enriching their overall experience. 3. Simplify logistics: Travel can be complex, especially for those unfamiliar with a new area. Inbound travel agencies help streamline logistics by coordinating transportation (such as airport transfers), managing routes, and ensuring that all aspects of travel run smoothly. This reduces stress for travelers and allows them to focus on enjoying their vacation. 4. Supporting the local economy: By promoting local businesses such as hotels, restaurants and attractions, receptive travel agencies contribute significantly to the economic health of tourist destinations. They often collaborate with local providers to create packages that benefit both tourists and residents, encouraging sustainable tourism practices. In short, inbound travel agencies are vital in tourism areas as they improve visitor satisfaction through personalized service, while simultaneously supporting the local economy and providing valuable insight into the destination's offerings. This confirms Initial Hypothesis H, which states that travel agencies of a receptive nature are an important link in the promotion of the destination and the attraction of foreign tourists.

This paper explores the role of receptive tourism agencies in the development and promotion of rural and spa tourism. Tourism agencies and organizations play a key role in connecting rural areas with potential tourists. They link visitors to destinations by creating package deals focused on authentic experiences, sustainability, gastronomy, local culture, and natural beauty. Receptive tourism agencies help rural and spa destinations become more competitive in the tourism market. The activities of the DM travel agency and the Sokobanja Tourist Organization demonstrate the significance of their role in ensuring the sustainability and promotion of the destination. Future research could explore the integration of advanced digital tools and platforms to further enhance the efficiency of marketing strategies and service delivery, providing tourists with a better and more engaging experience. Upcoming studies should focus on understanding the dynamic nature of sustainable tourist behavior and the factors influencing it. There is a need for more research on actual observed tourist behavior and the application of sustainable itinerary design for travelers. Receptive travel agencies operating at the destination face challenges brought by new trends. Their programs, excursions, and offers must be available in the form of a website, while the future of excursion organization should be sought through the development of their own mobile applications or integration with existing ones. This approach will further contribute to the sustainable development of tourism in Sokobanja. More effort should be invested in the education of tourism employees who have direct contact with visitors in Sokobanja. The Sokobanja Development Program for 2023–2027 does not mention the advantages of travel agencies operating in the area or the positive market effects they can have as receptive service providers. The reception of tourists is the first point of contact upon arrival, and the advisory-informative role is crucial for the overall experience of the destination for tourists. In many receptive tourism areas, there is often not enough awareness about the importance of sustainability in tourism. Considering environmental, social, and economic aspects during the creation and execution of tourist packages is essential for implementing sustainable development in the operations of tourism stakeholders. A better offer of a given destination is in the interest of all economic entities and reflects their social responsibility in the specific tourism market.

Author Contributions: Conceptualization, A.V. and M.A.; methodology, A.V. and P.B.; software, A.V.; validation, P.B. and A.V.; formal analysis, A.V.; investigation, P.B. and M.A.; data curation, M.A.; writing - original draft preparation, A.V.; writing - review and editing, A.V.; visualization, A.V.; supervision, M.A.. and P.B.. and A.V.; project administration, P.B. and A.V. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgments: This research is part of research funded by the MSTDI RS, agreed in decision no. 451-03-66/2024-03/200009 from 5th February 2024.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Addai, G., Suh, J., Bardsley, D., Robinson, G., & Guodaar, L. (2024). Exploring sustainable development within rural regions in Ghana: A rural web approach. *Sustainable Development*. https://doi.org/10.1002/sd.2887

Allan, M. (2025). Tourism experiences, motivations, and travel lifestyles preferences for domestic tourists: A case of Jordan. *Geojournal of Tourism and Geosites*, 58(1), 52–60. https://doi.org/10.30892/gtg.58105-1390

Arsić, M., Vujko, A., & Knežević, M. (2024a). Development Perspectives of Wellness and Spa Tourism in the context of the tourism business sustainability. *Sustainability*, 16(20), 1 – 20. https://doi.org/10.3390/su16208760

Arsić, M., Vujko, A., & Panić, A. (2024b). *The views of the local community on the impact of (spa) tourism development on the environment of Sokobanja*, Univerzitet Singidunum, Beograd, 2025. https://doi.org/10.15308/Sitcon-2024-43-49

Buhalis, D., & Ujma, D. (2006). Chapter 19 - Intermediaries: travel agencies and tour operators, Editor(s): Dimitrios Buhalis, Carlos Costa. Tourism Business Frontiers, Butterworth-Heinemann, 171-180. https://doi.org/10.1016/B978-0-7506-6377-9.50026-2

Baum, T., & Lundtorp, S. (2001). Seasonality in Tourism. Pergamon. Oxford. UK., 9-11.

Breitsohl, J., & Garrod, B. (2016). Assessing tourists' cognitive, emotional and behavioural reactions to an unethical destination incident. *Tourism Management*, 54, 209-220. https://doi.org/10.1016/J.TOURMAN.2015.11.004

Chen, S., Paramaiah, C., Kumar, P., Khan, S., & Haomu, Q. (2025). Toward sustainable tourism: Insights from green financing and renewable energy. *Energy Strategy Reviews*, 57, 101618. https://doi.org/10.1016/j.esr.2024.101618

Chen, G., Wu, S., Zhou, J., & Tung, A. (2014). Automatic Itinerary Planning for Traveling Services. *IEEE Transactions on Knowledge and Data Engineering*, 26, 514-527. https://doi.org/10.1109/TKDE.2013.46

Choi, O. J., & Hyun, S. S. (2022). Development of employee silence scale in travel agencies. *Journal of Hospitality and Tourism Management*, 52, 208-218. https://doi.org/10.1016/j.jhtm.2022.06.016

Crăciun, A., Dezsi, Ș., Pop, F., & Cecilia, P. (2022). Rural Tourism - Viable Alternatives for Preserving Local Specificity and Sustainable Socio-Economic Development: Case Study - "Valley of the Kings" (Gurghiului Valley, Mureș County, Romania). *Sustainability*. https://doi.org/10.3390/su142316295

Da Silva, G., Vargas, J., & De Carvalho, A. (2024). Digital Tourism Marketing: *Applied Tourism*. https://doi.org/10.14210/at.v9i2.20268

Dos Santos, E. R. M., Pereira, N. L., Pinto, P., Boley, B. B., & Ribeiro, M. A. (2024). Imperialism, empowerment, and support for sustainable tourism: Can residents become empowered through an imperialistic tourism development model? *Tourism Management Perspectives*, 53, 101270. https://doi.org/10.1016/j.tmp.2024.101270

Deng, M., & Athanasopoulos, G. (2011). Modelling Australian domestic and international inbound travel: a spatial–temporal approach. *Tourism Management*, 32(5), 1075-1084. https://doi.org/10.1016/j.tourman.2010.09.006.

Dramićanin, S. (2019). The impact of authentic leadership on the commitment of employees in travel agencies in the republic of Serbia. *BizInfo*, 10(1), 29-41. https://doi.org/10.5937/bizinfo1901029D

Demirović Bajrami, D., Tretiakova, T. N., Syromiatnikova, Y. A., Petrović, M. D., & Radovanović, M. M. (2020). Tour guide's competencies as predictors of tourists' sustainable behavior – evidence from national parks. *GeoJournal of Tourism and Geosites*, 32(4), 1277–1282. https://doi.org/10.30892/gtg.32413-569

Gubarenko, A., Kadyrbekova, D., Imangulova, T., Luterovich, O., & Yespenbetov, N. (2020). Quest excursion, as interactive form of providing excursion services in kazakhstan. *GeoJournal of Tourism and Geosites*, 32(4), 1402–1409. https://doi.org/10.30892/gtg.32431-587

Gautam, V., & Bhalla, S. (2024). Exploring the relationships among tourism involvement, residents' empowerment, quality of life and their support for sustainable tourism development. *Journal of Cleaner Production*, 434, 139770. https://doi.org/10.1016/j.jclepro.2023.139770

González-Rodríguez, M. R., Díaz-Fernández, C. M., & Pulido-Pavón, N. (2023). Tourist destination competitiveness: An international approach through the travel and tourism competitiveness index. *Tourism Management Perspectives*, 47, 101127. https://doi.org/10.1016/j.tmp.2023.101127

Ho, T. P., Ho, M. T., & Huang, M. L. (2024). Understanding the impact of tourist behavior change on travel agencies in developing countries: Strategies for enhancing the tourist experience. *Acta Psychologica*, 249, 104463. https://doi.org/10.1016/j.actpsy.2024.104463

Hossain, K., Kumar, S., Shabbir, R., & Redwanuzzaman. (2024). Purchasing tourism services through online travel agency: does electronic word-of-mouth have influence? An empirical study on Bangladeshi tourists. *Geojournal of Tourism and Geosites*, 54(2spl), 771–783. https://doi.org/10.30892/gtg.542spl01-1252

Ilić, M. (2023). Establishment of a tourist agency under the Law of the Republic of Serbia. *Turističko poslovanje*, 31, 109-117. https://doi.org/10.5937/turpos0-43945

Inmor, S., Na-Nan, K., Phanniphong, K., Jaturat, N., & Hirnšal, M. (2025). Unveiling the metaverse: The mediating role of social interaction in enhancing tourism experiences. *Journal of Open Innovation: Technology, Market, and Complexity*, 11(1), 100461. https://doi.org/10.1016/j.joitmc.2024.100461

Jocić, L., Vujko, A., & Panić, A. (2024). Services quality as a factor for bridging the gap between expected and perceived services in agency business. *Turističko poslovanje*, 33(1), 71-79. https://doi.org/10.5937/turpos0-49765

Joppe, M. (2010). One Country's Transformation to Spa Destination: The Case of Canada. *Journal of Hospitality and Tourism Management*, 17(1), 117-126. https://doi.org/10.1375/jhtm.17.1.117

Kim, H. J., Kim, J., Baek, H. T., & Kim, C. (2025). ChatGPT personalized and humorous recommendations. *Annals of Tourism Research*, 110, 103857. https://doi.org/10.1016/j.annals.2024.103857

Knežević, M., Pindžo, R., Ćulić, M., Kovačić, S., Dunjić, M., & Vujko, A. (2024). Sustainable (re)development of tourism destinations as a pledge for the future – a case study from the Western Balkans. *Geojournal of Tourism and Geosites*, 56(4), 1564-1575. https://doi.org/10.30892/gtg.56413-1327

Law, R., Leung, K., & Wong, R. (2004). The impact of the Internet on travel agencies. *International Journal of Contemporary Hospitality Management*, 16, 100-107. https://doi.org/10.1108/09596110410519982

Liu, J., Hsu, F. C., Bai, Y., & Mai, H. (2024). A dual-benefit perspective of business travel. *Annals of Tourism Research*, 109, 103827. https://doi.org/10.1016/j.annals.2024.103827

López-Sanz, J., Penelas-Leguía, A., Gutiérrez-Rodríguez, P., & Cuesta-Valiño, P. (2021). Rural Tourism and the Sustainable Development Goals. A Study of the Variables That Most Influence the Behavior of the Tourist. *Frontiers in Psychology*, 12. https://doi.org/10.3389/fpsyg.2021.722973

Lapuz, M. C. M. (2023). The role of local community empowerment in the digital transformation of rural tourism development in the Philippines. *Technology in Society*, 74, 102308. https://doi.org/10.1016/j.techsoc.2023.102308

MacKenzie, J., & Dominic, H. (2023). Who sits at the Chef's Table? Food criticism and the spectacle of elite gastronomy. *Discourse, Context & Media*, 56, 100740. https://doi.org/10.1016/j.dcm.2023.100740

Milenković, L. (2011). Uticaj političkih i ekonomskih promena na razvoj srpskih banja (na primeru Sokobanje), Master rad, Alfa Univerzitet, Beograd.

Moll-De-Alba, J., Prats, L., & Coromina, L. (2016). The need to adapt to travel expenditure patterns. A study comparing business and leisure tourists in Barcelona. *Eurasian Business Review*, 6, 253-267. https://doi.org/10.1007/S40821-016-0046-4

Montenegro, I. (2015). La responsabilidad contractual en agencias de viajes receptivas / The contractual liability of the travel receptive agency, 11.

Nikolić, L., & Stanković, S. M. (2008). *Sokobanja 1837-2007,* Soko Banja: Organizacija za turizam, kulturu i sport.

Nesto, B., & Di Savino, F. (2016). *Chianti Classico: The Search for Tuscany's Noblest Wine*. Berkeley: University of California Press. https://doi.org/10.1525/9780520965539

Podovac, M., & Petrović, V. (2019). Role and importance of promoton through social networks on the example of touristorganization.

Page, J. S. (2011). Chapter 1 - Tourism today: Why is it a global phenomenon embracing all our lives? Editor(s): Stephen J. Page, Tourism Management (Fourth Edition), Butterworth-Heinemann, 1-34. https://doi.org/10.1016/B978-0-08-096932-9.10001-8

Pebrianto, M., Yuliati, Y., Kustanti, A., Sukesi, K., Hidayat, K., & Kurniawati, E. (2024). Development strategy towards a self-sustaining village based on SDGs through the tourism potential of samar village, pagerwojo district. *Geojournal of Tourism and Geosites*, 57(4spl), 2123–2132. https://doi.org/10.30892/gtg.574spl26-1379

Rajpal, A., Bhatia, S. K., Goel, S., & Kumar, P. (2024). Time delays in skill development and vacancy creation: Effects on unemployment through mathematical modelling. *Communications in Nonlinear Science and Numerical Simulation*, 130, 107758. https://doi.org/ 10.1016/j.cnsns.2023.107758

Rainero, C., & Modarelli, G. (2020). The Attractive Power of Rural Destinations and a Synergistic Community Cooperative Approach: A "Tourismability" Case. *Sustainability*. https://doi.org/10.3390/su12177233

Rizal, A., & Baizal, Z. (2023). Optimal Tourism Itinerary Recommendation Using Cuckoo Search Algorithm (Case Study: Yogyakarta Region). *2023 IEEE International Conference on Communication, Networks and Satellite (COMNETSAT)*, 59-63. https://doi.org/10. 1109/COMNETSAT59769.2023.10420591

Spasić, V. (2011). Poslovanje turističkih agencija i organizatora putovanja. Univerzitet Singidunum, Beograd, 234-235.

Stanković, M. S. (2009). Banje Srbije, Zavod za udžbenike, Beograd.

Stanković, M. S. (2012). Turističke destinacije – putovanjem do znanja, Zavod za udžbenike, Beograd.

Stanić Jovanović, S., & Pavlović, S. (2022). Opportunities and limitations of travel agency registration in the public administration sector in Serbia. Teme, 46(1), 303-320. https://doi.org/10.22190/TEME210119017S

Talwar, S., Dhir, A., Kaur, P., & Mäntymäki, M. (2020). Barriers toward purchasing from online travel agencies. *International Journal of Hospitality Management*. https://doi.org/10.1016/j.ijhm.2020.102593

Vujko, A., Gajić, T., Dragosavac, M., Maksimović, B., & Mrkša, M. (2017). Level of integration among rural accommodation sector and travel agencies. *Economic of agriculture*, 64(2)/2017, 659-670. https://doi.org/10.5937/ekoPolj1702659V

Vujko, A., Karabašević, D., Cvijanović, D., Vukotić, S., Brzaković, P., & Mirčetić, V. (2024). Women's empowerment in rural tourism as a key of sustainable communities transformation. *Sustainability* 2024, 16, 10412. https://doi.org/10.3390/su162310412

Wang, X., Mou, N., Zhu, S., Yang, T., Zhang, X., & Zhang, Y. (2024). How to perceive tourism destination image? A visual content analysis based on inbound tourists' photos. *Journal of Destination Marketing & Management*, 33, 100923. https://doi.org/10.1016/j.jdmm.2024.100923

Yeboah, R., & Ashie, D. (2024). Promotion of local food as tourism product in the Cape Coast Metropolis: An explorative research. *Heliyon*, 10(24), e40950. https://doi.org/10.1016/j.heliyon.2024.e40950

Žunić, L. (2016). Receptive cultural factors of Sarajevo tourism destination. *Journal of toursim and hospitality management*, 2, 19-25. https://doi.org/10.35666/25662880.2016.2.238

Article history: Received: 10.02.2025 Revised: 14.05.2025 Accepted: 05.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1179-1187
DOI 10.30892/gtg.602spl15-1491

ATTENTIVE ITEM2VEC MACHINE LEARNING METHOD FOR RECOMMENDING TOURIST DESTINATIONS IN INDONESIA

Aisha Kusuma PUTRI [1], Gumgum DARMAWAN [1*], Budhi HANDOKO [1]

[1]Universitas Padjadjaran, Department of Statistics, Faculty of Mathematics and Natural Sciences, Bandung, Indonesia; aisha23004@mail.unpad.ac.id (A.K.P.); gumgum@unpad.ac.id (G.D.); budhi.handoko@unpad.ac.id (B.H.)

Citation: Putri, A.K., Darmawan, G., & Handoko, B. (2025). Attentive item2vec machine learning method for recommending tourist destinations in Indonesia. *Geojournal of Tourism and Geosites*, 60(2spl), 1179–1187. https://doi.org/10.30892/gtg.602spl15-1491

Abstract: In today's digital era, recommendation systems have been used by various age groups. One of the recommendation systems that many people often use is the YouTube application, and users usually get video recommendations related to previously watched videos. This is evidence that this recommendation system is close and helps human life today. This makes researchers compete to develop better recommendation systems. One of the recommendation systems that is considered to have good performance is the Attentive Item2Vec (AI2V) method. The AI2V method is a development of the Item2Vec (I2V) method, which combines collaborative filtering with a neural network to get a recommendation. The advantages of AI2V are that it pays attention to the entire sequence of items (videos, images, etc) consumed by the user, the complex relationships between all items in the user's sequence, and can be applied in various recommendation systems. In this study, the AI2V method was applied to tourist assessment data on several tourist destinations in Indonesia (Jakarta, Yogyakarta, Bandung, Semarang and Surabaya). The data consists of 10,000 assessments given by 300 tourists. The AI2V methods include data preparation, data splitting, Attentive Context-Target Representation, Multi-Attentive User Representation, AI2V similarity function, Top 5 Recommendations, and performance evaluations. Based on the analysis used, AI2V produces the Top 5 Recommendations for tourist destinations, namely Keraton Surabaya, Desa Wisata Gamplong, Sanghyang Heuleut, Jogja Bay Pirates Adventure Waterpark, and Jogja Exotarium. The accuracy level with the Mean Percentage Ranking (MPR) is 0.48976, meaning that the recommended results for all tourists are considered reasonably good performance. The parameters used in the study include a learning rate (α) of 0.5, a window size of 500, and a max epoch of 50. The parameters that have been determined and the process run are expected to provide accurate recommendations and match the interests of tourists.

Keywords: attentive item2vec, destination, item2vec, tourism, tourist, recommendation system

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INTRODUCTION

Machine learning is a part of artificial intelligence that can process big data to make fast and accurate decisions in various aspects of life (Hou et al., 2020; Injadat et al., 2021). Machine learning has been studied since the late 1950s and has recently been increasingly developed by researchers (Badillo et al., 2020). One of the machine learning methods widely used by the public and companies today is the recommendation system. Large companies often use recommendation systems that offer goods and services, such as Google, Netflix, YouTube, Spotify, TikTok, etc (Bartlett et al., 2023; Jannach et al., 2022; Sánchez-Corcuera et al., 2024). These companies use recommendation systems to make it easier for customers to choose items (for example, goods, images, videos, sounds, and so on) (Ahmed et al., 2022; Geetha & Renuka, 2024; Lee et al., 2020; Tareq et al., 2020). The recommendation system has been introduced since the 1990s, and along with the development of science, researchers have studied the use of machine learning in recommendation systems (Bhareti et al., 2020). Recommendation systems play a major role in promotion. Therefore, companies rely on this system to support sales success (Stalidis et al., 2023). Before recommendations were developed using machine learning in recommendation systems, recommendations initially relied only on basic statistics to determine recommendations (Shan et al., 2019).

Recommendations are made by calculating the average rating score of an item and recommending items based on the highest average rating score (Gupta & Kant, 2020). Then, the recommendations continue to develop and can be calculated using correlation analysis (Wang et al., 2023). Recommendations using this simple approach are less commonly used because they cannot capture complex user behavior patterns in the data (Cui et al., 2020; Li et al., 2021; Tahmasbi et al., 2021). In this case, it is complex, including cost factors, location, etc.

In addition, correlation analysis requires a sufficient sample size to produce accurate estimates, while user data is not always available with a sufficient sample size (Andrade, 2020). Therefore, in getting recommendations, it is highly recommended that machine learning or so-called recommendation systems be used to provide more effective and appropriate recommendations (Alfaifi, 2024). The recommendation system has advantages, including allowing the system to continue to adapt to changes in user preferences and allowing it to make relevant recommendations. Machine learning allows the system to capture relationships that simple recommendations cannot explain.

[*] Corresponding author

There are two recommendation system types, content-based and collaborative filtering (Alamdari et al., 2020; Sharma et al., 2022). Among the two recommendation systems, collaborative filtering is a popular and widely used recommendation system (Gupta et al., 2020). Collaborative filtering (CF) is a recommendation system based on explicit feedback, such as the rating score given by the user (Chen et al., 2020; Patoulia et al., 2022). Neural networks in CF are used to predict the value of each item as a number (He et al., 2015). In predicting the value of each item, a weighting technique is used with optimization to obtain a vector representation of numbers for the appropriate item. One combination of CF with a neural network in a recommendation system is the Item2Vec (I2V) method. The I2V method was designed by Barkan and Koenigstein in 2016. In previous studies, I2V had an accuracy of 68% (Barkan & Koenigstein, 2016) and an accuracy of 61% (Putri & Suliadi, 2023). This accuracy is considered a poor performance, so in 2020, Barkan et al. developed I2V into Attentive Item2Vec (AI2V). Like I2V, AI2V also represents items in a vector of numbers to capture various behavioural patterns in the item history and get items that might be recommended. AI2V has outperformed previous methods, including I2V (Barkan et al., 2020). The advantages of AI2V compared to I2V are that AI2V pays attention to the entire sequence of items consumed by the user, pays attention to the relationship of all more complex items using the attention mechanism and can be applied in various types of recommendation systems (e.g., product recommendations, music content and others). Previous studies related to AI2V include Barkan et al. (2020) about AI2V, then Gaiger et al. (2023) about AI2V++. In addition, there is research from Putri & Suliadi (2023) who studied the Item2Vec (I2V).

In this study, AI2V is applied to the tourism sector to generate destination recommendations. The application of AI2V in the tourism sector is a relatively new approach, considering that previously this method was more widely used in recommendation systems in the entertainment sector, such as movies and music. The adaptation of AI2V for tourism recommendation systems aims to capture tourist preferences for destinations, which have different characteristics compared to entertainment items. By expanding the application of AI2V to the tourism sector, this study opens up new opportunities for the development of AI2V-based recommendation systems in various application areas. The data used is the assessment data of tourist destinations in Indonesia. Based on this assessment, AI2V will recommend the five best tourist destinations (Top 5 Recommendations) based on previous tourist destination visit records. In the field of tourism, this research provides a significant contribution to the development of tourist destinations in Indonesia, especially in Jakarta, Yogyakarta, Bandung, Semarang and Surabaya. So far, Bali has been the most well-known destination, both by domestic and foreign tourists. Therefore, efforts are needed to promote other tourist destinations in Indonesia so that Bali is not the only one in the spotlight. This research is expected to be one of the strategic steps to increase the popularity and competitiveness of other tourist destinations. So the study limits the scope to the data of tourist destination assessment in Indonesia for the cities of Jakarta, Yogyakarta, Bandung, Semarang and Surabaya. In addition, this study focuses on the application of the Attentive Item2Vec (AI2V) method. And finally, the results of this study are in the form of general recommendations for tourists.

MATERIALS AND METHODOLOGY

This study applies a combination of neural networks with collaborative filtering, namely Attentive Item2Vec (AI2V), to represent tourist behaviour patterns so that tourist destination recommendations can be found for tourists. AI2V is a method that studies dynamically changing user patterns with various potential new recommendations (Barkan et al., 2020). The data in this study are assessment data from tourists at several tourist destinations in Indonesia (Jakarta, Yogyakarta, Bandung, Semarang and Surabaya). This data was obtained from the Kaggle site uploaded by the Getloc Team in July 2021 (Prabowo et al., 2021). The data consists of 10,000 assessments given by 300 tourists. The evaluation was carried out by tourists using a rating score of 1 (very dislike), 2 (dislike), 3 (moderate), 4 (like), and 5 (very like). The main instrument in this study is the AI2V method, which is applied to the assessment data of tourist destinations in Indonesia. Figure 1 is a flowchart of the AI2V method to analyse tourist destination assessment data in Indonesia (Barkan et al., 2020).

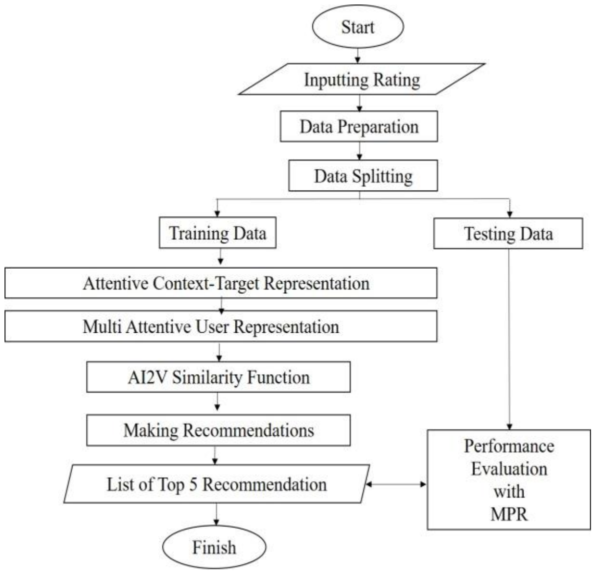

Figure 1. Flowchart of the Attentive Item2Vec (AI2V)

The process of AI2V starts from the "Start". Then, "Inputting Rating", where the rating is a list of users and the assessment given to an item. Next, the data is processed in the "Data Preparation" stage to ensure the data is ready to use. After that, "Data Splitting" is carried out to divide the data into "Training Data" and "Testing Data". Training Data is used to form "Attentive Context-Target Representation" in studying the relationship between context and target items. Next, the "Multi-Attentive User Representation" stage is used to build a more in-depth user representation. Then, the system applies the "AI2V Similarity Function" to calculate the similarity between items or users.

Based on these results, the system makes recommendations through the "Making Recommendations" and produces a "List of Top 5 Recommendations". On the other hand, "Testing Data" is used to perform "Performance Evaluation with MPR" to evaluate the performance of the Top 5 Recommendations. After going through all the stages, the process ends with "Finish" with the results being Top 5 Recommendations and MPR scores.

o support data processing in this study, the Python language is used on Google Colab based on the GitHub link by the following Kerengaiger account https://github.com/kerengaiger/ai2v/tree/master/models.

DATA ANALYSIS

This section describes the stages of the AI2V analysis process, complete with explanations and accompanying equations. This description refers to the flow shown in Figure 1. The analysis consists of seven subsections and includes a total of 22 equations. The entire series of seven stages produces outputs in the form of recommendations and MPR scores.

1. Data Preparation

Data preparation is transforming original data into data with a more suitable structure for analysis using the method used (Hameed & Naumann, 2020). In the AI2V data preparation stage, the assessment is used with rating scores of 4 (like) and 5 (very like) (Barkan et al., 2020). Next, filtering all tourists with fewer than three tourist destinations (Barkan et al., 2020). This is done so that the data prepared has sufficient information and can capture tourist behaviour patterns. The data structure for applying AI2V is shown in Table 1.

Table 1. Data Structure for Attentive Item2Vec (AI2V)

Tourist	Destination Code
1	5,101,258,20,393,208,405,41,336,67,246,265,307
2	2,322,85,78,437,407,208,437,384,426,18
⋮	⋮
150	4,220,320,28,333,311,51,332,411,83,14,371,292,81,239,427,28,341
⋮	⋮
300	69,200,285,343,144,193,435,346,255,416,108,103,64,279

2. Data Splitting

Data splitting is separating a data set into training and testing data. In AI2V, the proportion of training and testing data is determined by taking the last destination in each user list to be used as test data, and the rest is training data (Barkan et al., 2020).

3. Attentive Context-Target Representation

Attentive context-target representation is a vector representation for context destinations and target destinations attentively. The target destination is the destination for which recommendations will be sought, while the context destination is the historical destination that is on the same list as the target destination. For example, in Table 1, the first tourist, if the target destination (l_j) is a destination with code 307, then the context destination (l_m) is a destination with code 5 to destination code 265. Equation (1) is used to model attentive context-target representation (Barkan et al., 2020) .

$$\boldsymbol{a_{j-1}} = \sum_{m=1}^{L} c_{jm} \boldsymbol{Bc}\, \boldsymbol{u}_{l_m} \tag{1}$$

We will obtain $\boldsymbol{a_{j-1}} = (a_{j-1}^1, \ldots, a_{j-1}^N)$. a_{j-1} shows the historical representation of each u tourist, denoted by $\boldsymbol{\alpha_{j-1}^u}$. $\boldsymbol{u_{l_m}}$ is the input data context formed using one-hot encoding. One-hot encoding is a vector of size $L \times 1$ containing the values 1 and 0. L measures the number of tourist destinations for tourists u in the training data. In one-hot encoding, the position of the number 1 is determined based on the position of the context destination (l_m) on the tourist list.

For example, $\boldsymbol{u_{l_m}}$ for the first tourist, if the destination m is in the first position on the list, then the number 1 is placed in the first row. Here is $\boldsymbol{u_{l_1}}$ for the first tourist.

$$\boldsymbol{u_{l_1}} = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix}$$

Where $\boldsymbol{u}_{l_m} = \{xc_1, xc_2, \ldots, xc_m, \ldots, xt_L\}$, with xc_m is the value of the m-th context layer input, and xt_L is the destination target. Meanwhile, $\boldsymbol{Bc}$ does a linear transformation obtain a learnable linear mapping. Weight is a linear transformation that the neural network must learn. So, $\boldsymbol{Bc}$ does the neural network learn the weight during training. Based on this, determining $\boldsymbol{Bc}$ involves the neural network process below.

a. Feedforward

The feedforward process consists of input, hidden, and output layers. In this stage, the input layer is namely xc_m, the value of the m-th context layer input. The hidden layer calculation is done using equation (2) (Wadi, 2021).

$$h_m^{Bc} = \sum_{p=1}^{L}\sum_{m=1}^{L}\left(Bc_{pm} \times xc_m\right) \tag{2}$$

Bc_{pm} is the elements in the p-th row and m-th column of the weight matrix $\boldsymbol{Bc}$, while xc_m is the value of the m-th context layer input. The weight matrix $\boldsymbol{Bc}$ is first obtained from initialization with random values 0 to 0.05 with a matrix size of $L \times L$, L is the row size of $\boldsymbol{u_{l_m}}$. $\boldsymbol{u_{l_m}}$ is the input data context formed using one-hot encoding. One-hot encoding is a vector of size $L \times 1$ containing the values 1 and 0. If the calculation is done in matrix form, equation (2) becomes equation (3) (Wadi, 2021).

$$\boldsymbol{h^{Bc}}_{(\boldsymbol{L\times 1})} = \boldsymbol{Bc} \times \boldsymbol{u_{l_m}} \tag{3}$$

After obtaining the hidden layer, the output layer is calculated using equation (4) (Wadi, 2021).

$$\widehat{y_m^{Bc}} = \sum_{q=1}^{L}\sum_{m=1}^{L}\left(Bc'_{qm} \times h_m^{Bc}\right) \tag{4}$$

Where Bc'_{qm} is the element in the q-th row and m-th column of the weight matrix $\boldsymbol{Bc'}$, while h_m^{Bc} is the value of the m-th hidden layer context. The weight matrix $\boldsymbol{Bc'}$ is first obtained from initialization with a value of 0 to 0.05 with a matrix size of $L \times L$. If in matrix form, equation (4) becomes equation (5) (Wadi, 2021).

$$\widehat{\boldsymbol{y^{Bc}}}_{(\boldsymbol{w\times 1})} = \boldsymbol{f}(\boldsymbol{Bc'} \times \boldsymbol{h^{Bc}}) \tag{5}$$

f is the softmax activation function calculated using equation (6) (Wadi, 2021).

$$\boldsymbol{f}(\boldsymbol{Bc'} \times \boldsymbol{h^{Bc}}) = \frac{\boldsymbol{e}^{(\boldsymbol{Bc'}\times\boldsymbol{h^{Bc}})_{\boldsymbol{m}}}}{\sum_{\boldsymbol{m=1}}^{\boldsymbol{L}} \boldsymbol{e}^{(\boldsymbol{Bc'}\times\boldsymbol{h^{Bc}})_{\boldsymbol{m}}}} \tag{6}$$

Next, the Binary Cross-Entropy (BCE) loss function is calculated using equation (7). The BCE calculation determines whether the weights are optimal and whether the training process should stop or undergo backpropagation.

$$E^{Bc} = -\frac{1}{L}\sum_{m}^{L}[\, y_m^{Bc}\, log\left(\widehat{y_m^{Bc}}\right) + (1 - y_m^{Bc}) log(1 - \widehat{y_m^{Bc}})] \tag{7}$$

With y_m^{Bc} is the target value where t is given a value of 0 because of the destination context, while $\widehat{y_m^{Bc}}$ is the softmax activation value of the i-th context layer output. The criteria are if the E^{Bc} value is less than or equal to the error tolerance (α), then the training process stops. At the same time, if the E^{Bc} value is greater than the error tolerance (α), then the backpropagation process is needed.

b. Backpropagation

In the backpropagation process, weight calculations are carried out to obtain optimal weights and a minimum error rate. First, the weight calculation connects the output layer with the hidden layer, called the second weight ($\boldsymbol{Bc'}$), using equation (8) (Wadi, 2021).

$$Bc'_{qm}(new) = Bc'_{qm} + \Delta Bc'_{m} \tag{8}$$

If the calculation is carried out in matrix form, equation (8) becomes equation (9) (Wadi, 2021).

$$\boldsymbol{Bc'}(\boldsymbol{new})_{(\boldsymbol{L\times L})} = \boldsymbol{Bc'} + \Delta\boldsymbol{Bc'} \tag{9}$$

is the element in the q-th row and m-th column of the weight matrix Bc', while $\Delta Bc'_m$ is the weight correction that connects the output of the m-th context layer with the m-th hidden context layer obtained from equation (10) (Wadi, 2021).

$$\Delta Bc'_m = \alpha\delta_m^{Bc}h_m^{Bc} \tag{10}$$

Where $\alpha > 0$ does the researcher determine the learning rate and h_m^{Bc} is the hidden layer context value obtained in the feedforward section. At the same time, δ_m^{Bc} is the correction factor from the m-th output layer context. δ_m^{Bc} is obtained from the calculation with equation (11) (Wadi, 2021).

$$\delta_m^{Bc} = (t_m^{Bc} - \widehat{y_m^{Bc}})\widehat{y_m^{Bc}}(1 - \widehat{y_m^{Bc}}) \tag{11}$$

With t_m^{Bc} is the target output on the output layer context, which in the target destination is given a value of 1 and the destination context is given a value of 0. At the same time, $\widehat{y_m^{Bc}}$ is the output layer context value obtained in the feedforward section. After the calculation of the $\boldsymbol{Bc}$ weight updates and the $\boldsymbol{Bc}(\boldsymbol{new})$ weight is obtained, the next step is to calculate the $\boldsymbol{Bc}$ weight using equation (12) (Wadi, 2021).

$$Bc_{pm}(new) = Bc_{pm} + \Delta Bc_m \tag{12}$$

Bc_{pm} is an element in the p-th row and m-th column of the weight matrix $\boldsymbol{Bc}$. At the same time, ΔBc_m is a weight correction that connects the m-th hidden layer context with the m-th input layer context. If the calculation is done in matrix form, equation (12) becomes equation (13) (Wadi, 2021).

$$\boldsymbol{Bc}(\boldsymbol{new})_{(\boldsymbol{L\times L})} = \boldsymbol{Bc} + \Delta\boldsymbol{Bc} \tag{13}$$

The value of ΔBc_m is obtained from the calculation of equation (14) (Wadi, 2021).

$$\Delta Bc_m = \alpha\delta h_m^{Bc}xc_m \tag{14}$$

With $m = 1, \ldots, L$. While $\alpha > 0$ does the researcher determine the learning rate and xc_m is the input of the m-th context layer. $\delta h_m^{Bc}$is the correction factor of the m-th context layer hidden obtained from equation (15) (Wadi, 2021).

$$\delta h_m^{Bc} = \delta o_m^{Bc}h_m^{Bc}(1 - h_m^{Bc}) \tag{15}$$

Where h_m^{Bc} is the value of the m-th hidden layer obtained in the feedforward section, at the same time, $\delta o_m^{Bc}$is the correction factor signal from the context layer output to the context hidden layer. δo_m^{Bc} is obtained from the calculation with equation (16) (Wadi, 2021).

$$\delta o_m^{Bc} = \sum_{m=1}^{L} Bc'_{qm}\, \delta_m^{Bc} \tag{16}$$

Bc'_{qm} is the element in the q-th row and m-th column of the weight matrix Bc', while δ_m^{Bc} is the correction factor of the m-th context layer output. After the $\boldsymbol{Bc}$ weight update calculation is performed and the $\boldsymbol{Bc(new)}$ weight is obtained, the next step is to perform the feedforward calculation again until it produces E^{Bc} that meets the researcher's criteria. While c_{jm} is the attention weight to emphasize further relevant destinations (target destinations), attention weights are calculated using equation (17) (Barkan et al., 2020).

$$c_{jm} = \frac{exp(h\left(\boldsymbol{Ac}\,\boldsymbol{u}_{l_m}, \boldsymbol{At}\,\boldsymbol{v}_{l_j}\right))}{\sum_{k=1}^{m-1} exp(h\left(\boldsymbol{Ac}\,\boldsymbol{u}_{l_k}, \boldsymbol{At}\,\boldsymbol{v}_{l_j}\right))} \tag{17}$$

With $m = 1, 2, \dots, j$ and $k = 2, 3, \dots, m-1$. Where $\boldsymbol{At}$ and $\boldsymbol{Ac}$ are each learnable linear mapping just like $\boldsymbol{Bc}$. So, $\boldsymbol{At}$ and $\boldsymbol{Ac}$ does the neural network learn the weights during the training process. Based on this, the process of determining $\boldsymbol{At}$ and $\boldsymbol{Ac}$ involves the neural network process. The stages carried out are the same as $\boldsymbol{Bc}$, with the difference that $\boldsymbol{At}$ and $\boldsymbol{Ac}$ are weight matrices measuring $w \times L$. The size of w, or called the window size, can be worth 50 to 1000, and there is no definite rule in determining w; the more significant the w, the better the results obtained, but it will slow down the processing time (Af'idah et al., 2021). The number of w is a characteristic of a destination, so if w is worth 50, then the number 50 is a number that explains or defines a destination. Barkan & Koenigstein (2016) used w of 100 for data measuring 2,500 to 20,000. Meanwhile, the size of L is the row size of $\boldsymbol{v}_{l_j}$ or $\boldsymbol{v}_{l_m}$. For the feedforward process, the size of the $\boldsymbol{At'}$ and $\boldsymbol{Ac'}$ matrix is $w \times w$.

4. Multi-Attentive User Representation

Multi-attentive user is a comprehensive representation of all tourists based on target destinations previously determined using equation (18) (Barkan et al., 2020).

$$\boldsymbol{z_{j-1}} = \boldsymbol{S}\boldsymbol{w}_{j-1} \tag{18}$$

Where $\boldsymbol{w}_{j-1} = [\left(\boldsymbol{a}_{j-1}^1\right)^T, \dots, \left(\boldsymbol{a}_{j-1}^N\right)^T]^T$ and $\boldsymbol{S}$ are learnable linear mappings. Like $\boldsymbol{Bc}$, $\boldsymbol{At}$, and $\boldsymbol{Ac}$, $\boldsymbol{S}$ is obtained from the neural network process. The steps taken are the same as $\boldsymbol{Bc}$, $\boldsymbol{At}$, and $\boldsymbol{Ac}$, with the difference that $\boldsymbol{S}$ is a weight matrix measuring $L \times LN$. L is the row size of $\boldsymbol{v}_{l_j}$ or $\boldsymbol{v}_{l_m}$, while N is the size of the number of tourists.

5. AI2V Similarity Function

After calculating the Attentive context-target representation and Multi-Attentive User Representation, the next step is calculating the AI2V Similarity Function using equation (19) (Barkan et al., 2020).

$$o\left(z_{j-1}, v_{l_j}\right) = \psi_o\left(z_{j-1}, Bt, v_{l_j}\right) + b_{l_j} \tag{19}$$

Where ψ_o is the neural scoring function calculated in equation (20) (Barkan et al., 2020). b_{l_j} is the target bias term for the item l_j. The bias is set to a small value, such as 0.1 (Goodfellow et al., 2016).

$$\psi_o\left(z_{j-1}, B_t v_{l_j}\right) = \boldsymbol{z_{j-1}}^{\boldsymbol{T}} \times \boldsymbol{Bt} \times \boldsymbol{v}_{\boldsymbol{l_j}} \tag{20}$$

Equation (20) is a hidden-layer neural network with scalar output. $\boldsymbol{z_{j-1}}^{\boldsymbol{T}}$ is a transpose of a multi-attentive user. $\boldsymbol{Bt}$ is a learnable linear mapping obtained from the neural network. The steps taken are the same as $\boldsymbol{Bc}$, the difference is the input, namely $\boldsymbol{v}_{\boldsymbol{l_j}}$.

6. Making Recommendations

Recommendations are obtained by sorting the AI2V similarity function values in equation (20). The similarity values generated between $\boldsymbol{v}_{\boldsymbol{l_j}}$ and $\boldsymbol{u}_{\boldsymbol{l_m}}$are then sorted from the largest to the smallest. The greater the similarity value, the greater the relationship. The destination paired with the five highest similarity values will enter the Top 5 Recommendations of tourist destinations in Indonesia. Then, to complete the information from Table 2 we will find out the names and cities for each destination code.

Table 2. Description of Destination

Destination Code	Destination name	City
1	Monumen Nasional	Jakarta
2	Kota Tua	Jakarta
⋮	⋮	⋮
436	Taman Flora Bratang	Surabaya

7. Performance Evaluation

Testing data is used to evaluate the performance of the AI2V model. Recommendation performance can be evaluated using the Mean Percentage Ranking (MPR). MPR is the average percentile ranking for each sample with user satisfaction based on the recommendation list (Ginzburg et al., 2021). The calculation begins with the calculation of the percentile ranking for each tourist. If the destination from the testing data (l_t) is found in the recommendation list, then the calculation is carried out using Equation (21) (Gaiger et al., 2023). For the same destination for different tourists, the same order is given.

$$PR_t = \left(\frac{Position\ l_t}{T}\right) \tag{21}$$

With $t = 1,2,\dots,T$, in this case T is the number of tourists in the testing data. While the position (l_t) is the order of destinations in the overall recommendation list and N is the number of tourists. After calculating the PR for each tourist in the testing data (t), the next step is to calculate the overall MPR using Equation (22) (Gaiger et al., 2023).

$$MPR = \frac{\sum_{t=1}^{T} PR_t}{T} \tag{22}$$

Where $\sum_{t=1}^{T} PR_t$ is the sum of the percentile ranks for each t. The criteria for a good MPR value are those below 0.5 (Gaiger et al., 2023).

RESULTS AND DISCUSSIONS

This section displays all the results of the AI2V process. As mentioned earlier, this study uses the Python language and Google Colab. Before the AI2V method analysis section, a descriptive analysis was first carried out to see the distribution of tourist destination data. Based on Figure 2, the tourist destination with the highest frequency of visits is Keraton Surabaya, Sanghyang Heleut, Bukit Jamur, Desa Wisata Gamplong, Bukit Jamur, Jogja Bay Pirates Adventure Waterpark, Jogja Exotarium, Geofest Watu Payung Turunan, Taman Sungai Mudal and Kampung Batu Malakasari.

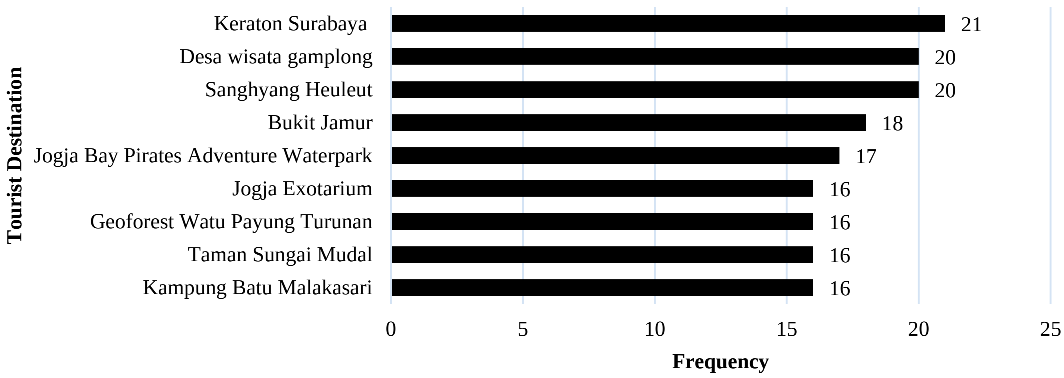

Figure 2. 10 Tourist Destinations with the Most Visiting Frequency

The results will later validate the results obtained using Python. In AI2V analysis, selecting optimal parameters such as window size, max epoch, and learning rate is very important to produce maximum model performance.

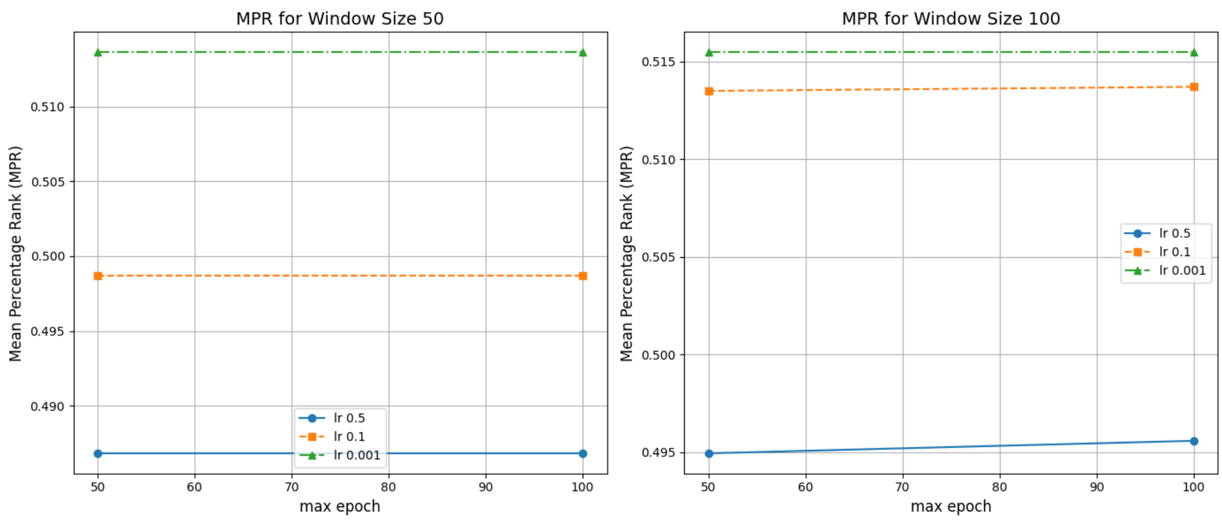

Figure 3. Mean Percentage Rank (MPR) For Window Size 50 and 100

First, comparing the Mean Percentage Rank (MPR) values at two window sizes ($w = 50,100$), which are shown in Figure 3. The first graph (left) shows the results with $w = 50$, while the second graph (right) shows the results with $w = 100$. At $w = 50$, all variations in learning rate ($\alpha = 0.5, 0.1, 0.001$) produce relatively stable MPR values even though the number of epochs increases. Meanwhile, at $w = 100$, there is a more significant increase in MPR, especially at $\alpha = 0.5$ as the number of epochs increases. Based on these results, it can be concluded that increasing max epoch tends to keep the MPR value constant or slightly increase. However, if observed further, max epoch 50 produces the lowest MPR value compared to larger max epochs. Given that the purpose of this study is to obtain the lowest possible MPR value, a max epoch of 50 is chosen as the most optimal parameter.

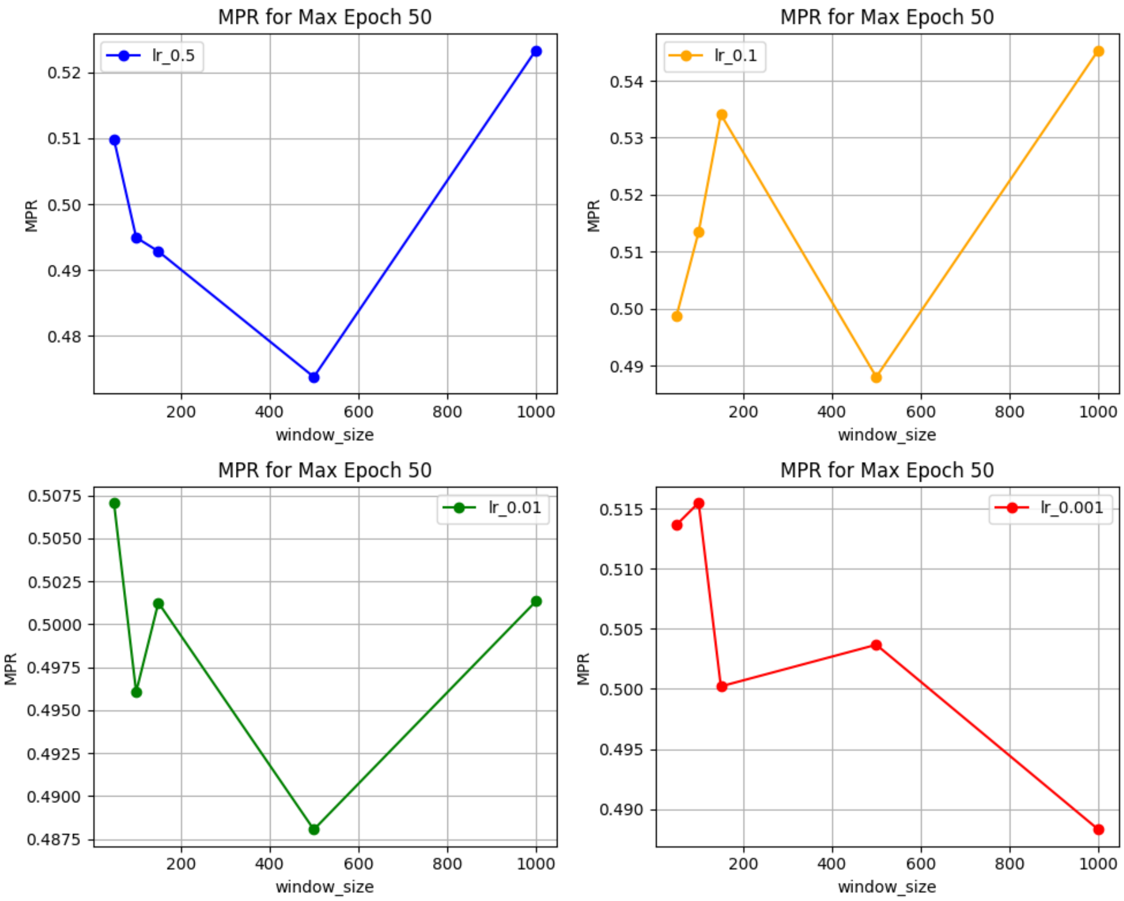

Figure 4. Mean Percentage Rank (MPR) For Max Epoch 50

Based on Figure 4, the effect of window size (w variations on the MPR value at max epoch 50 with four different levels of $\alpha = 0.5, 0.1, 0.01, 0.001$. At $\alpha = 0.5$ (top left), the MPR reaches its lowest point at $w = 500$ with an MPR below 0.48, it then increases gradually until it reaches its peak at $w = 1{,}000$ with an MPR above 0.52. A similar pattern is seen at $\alpha = 0.1$ (top right), where MPR reaches its lowest point when $w = 500$ with MPR below 0.49 and then increases until $w = 1{,}0000$. While at $\alpha = 0.01$ (bottom left), MPR reaches its lowest value at $w = 500$ with MPR below 0.49, then it increases slowly until $w = 1{,}000$. Meanwhile, $\alpha = 0.001$ (bottom right) shows a more stable downward trend, with the lowest MPR at $w < 200$ with MPR of 0.5. Overall, it can be concluded that MPR tends to reach its lowest point when $w = 500$, then increases again as the window size increases. Based on this, $w = 500$ is optimal because it has the smallest MPR value for $\alpha = 0.5, 0.1, 0.01$. In addition, $\alpha = 0.5$ was also chosen in this analysis because it has the smallest MPR value among the other α, namely below 0.48.

Table 3. Top 5 Recommendation Tourist Destinations in Indonesia

No	Destination Code	Destination Name
1	416	Keraton Surabaya
2	300	Sanghyang Heuleut
3	134	Desa Wisata Gamplong
4	183	Jogja Bay Pirates Adventure Waterpark
5	138	Jogja Exotarium

Top 5 recommendations in Table 3 from the AI2V method. The Top recommendations include Keraton Surabaya, Sanghyang Heuleut, Desa Wisata Gamplong, Jogja Bay Pirates Adventure Waterpark and Jogja Exotarium. The five destinations were designated Top recommendations because they have the largest similarity score. These destinations are expected to be recommendations for tourists who want to travel to a place. The MPR accuracy value is 0.48976, this value shows that the recommendations are pretty good and can provide recommendations that follow the interests of tourists.

CONCLUSIONS

Based on the results and discussion, the Top 5 Recommendations for tourist destinations in Indonesia are obtained along with the MPR value to measure the recommendations' accuracy. The parameters used in the study include a learning rate (α) of 0.5, a window size of 500, and a max epoch of 50. The parameters that have been determined and the process run are expected to provide accurate recommendations and match the interests of tourists.

The Top 5 Recommendations generated in this study are Keraton Surabaya, Sanghyang Heuleut, Desa Wisata Gamplong, Jogja Bay Pirates Adventure Waterpark and Jogja Exotarium. It is hoped that implementing AI2V can help many tourists who often feel confused when choosing tourist destinations in Indonesia, especially Jakarta, Yogyakarta, Bandung, Semarang, and Surabaya. In addition, these recommendations also provide strategic advantages for travel agents in offering tourist destinations that are more in line with the desires of tourists to increase sales opportunities and customer satisfaction. The level of accuracy using the Mean Percentage Ranking (MPR) of the Top 5 AI2V recommendations generated is 0.48976. This value is below 0.5, meaning that the recommendation results for all tourists are assessed as quite good performance and by tourist interests. Suggestions for further research are adding other data and variables that can influence the recommendation results, such as user domicile, economic level, and other factors.

In addition, using tourist behavioral data, such as search patterns, activity preferences, or duration of visits to certain tourist destinations, can be an interesting approach. This combination is expected to produce a more relevant, accurate recommendation system that meets the specific needs of each tourist.

This research is expected to contribute to increasing insight, knowledge, and information for researchers and academics regarding recommendation systems using the Attentive Item2Vec (AI2V) method.

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

Funding: 1/UN6.RKT/Kep/HK/2025

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgements: The author expresses gratitude to Universitas Padjadjaran for the support and funding provided for the publication of this thesis, with the thesis number "T.302/AIS/PROG/STAT/2025" This assistance is highly valuable in facilitating the completion of this research and contributing to the author's academic work.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Af'idah, D. I., Dairoh, Handayani, S. F., & Pratiwi, R. W. (2021). Pengaruh Parameter Word2Vec terhadap Performa Deep Learning pada Klasifikasi Sentimen. *Jurnal Informatika: Jurnal Pengembangan IT (JPIT)*, *6*(3). https://doi.org/https://doi.org/10.30591/jpit.v6i3.3016

Ahmed, M., Ansari, M. D., Singh, N., Gunjan, V. K., Krishna, B. S., & Khan, M. (2022). Rating-Based Recommender System Based on Textual Reviews Using IoT Smart Devices. *Mobile Information Systems*, *2022*, 1–18. https://doi.org/10.1155/2022/2854741

Alamdari, P. M., Navimipour, N. J., Hosseinzadeh, M., Safaei, A. A., & Darwesh, A. (2020). A Systematic Study on the Recommender Systems in the E-Commerce. *IEEE Access*, *8*, 115694–115716. https://doi.org/10.1109/ACCESS.2020.3002803

Alfaifi, Y. H. (2024). Recommender Systems Applications: Data Sources, Features, and Challenges. *Information*, *15*(10), 660. https://doi.org/10.3390/info15100660

Andrade, C. (2020). Sample Size and Its Importance in Research. *Indian Journal of Psychological Medicine*, *42*(1), 102–103. https://doi.org/10.4103/IJPSYM.IJPSYM_504_19

Badillo, S., Banfai, B., Birzele, F., Davydov, I. I., Hutchinson, L., Kam-Thong, T., Siebourg-Polster, J., Steiert, B., & Zhang, J. D. (2020). An Introduction to Machine Learning. *Clinical Pharmacology & Therapeutics*, *107*(4), 871–885. https://doi.org/10.1002/cpt.1796

Barkan, O., Caciularu, A., Katz, O., & Koenigstein, N. (2020). Attentive Item2Vec: Neural Attentive User Representations. https://doi.org/10.48550

Barkan, O., & Koenigstein, N. (2016). Item2Vec: Neural Item Embedding for Collaborative Filtering. https://doi.org/https://doi.org/10.48550

Bartlett, M., Morreale, F., & Prabhakar, G. (2023). Analysing Privacy Policies and Terms of Use to understand algorithmic recommendations: the case studies of Tinder and Spotify. *Journal of the Royal Society of New Zealand*, *53*(1), 119–132. https://doi.org/10.1080/03036758.2022.2064517

Bhareti, K., Perera, S., Jamal, S., Pallege, M. H., Akash, V., & Wiieweera, S. (2020). A Literature Review of Recommendation Systems. *2020 IEEE International Conference for Innovation in Technology (INOCON)*, 1–7. https://doi.org/10.1109/INOCON50539.2020.9298450

Chen, J., Lian, D., & Zheng, K. (2020). Collaborative Filtering with Ranking-Based Priors on Unknown Ratings. *IEEE Intelligent Systems*, *35*(5), 38–49. https://doi.org/10.1109/MIS.2020.3000012

Cui, Z., Xu, X., Xue, F., Cai, X., Cao, Y., Zhang, W., & Chen, J. (2020). Personalized Recommendation System Based on Collaborative Filtering for IoT Scenarios. *IEEE Transactions on Services Computing*, *13*(4), 685–695. https://doi.org/10.1109/TSC.2020.2964552

Gaiger, K., Barkan, O., Tsipory-Samuel, S., & Koenigstein, N. (2023). Not All Memories Created Equal: Dynamic User Representations for Collaborative Filtering. IEEE Access, 11, 34746–34763. https://doi.org/10.1109/ACCESS.2023.3263931

Geetha, M. P., & Renuka, D. K. (2024). Deep Learning Architecture Towards Consumer Buying Behaviour Prediction Using Multitask Learning Paradigm. *Journal of Intelligent & Fuzzy Systems*, *46*(1), 1341–1357. https://doi.org/10.3233/JIFS-231116

Ginzburg, D., Malkiel, I., Barkan, O., Caciularu, A., & Koenigstein, N. (2021). Self-Supervised Document Similarity Ranking via Contextualized Language Models and Hierarchical Inference. https://doi.org/10.18653/v1/2021.findings-acl.272

Goodfellow, I., Bengio, Y., & Courville, A. (2016). Deep Learning. MIT Press.

Gupta, M., Thakkar, A., Aashish, Gupta, V., & Rathore, D. P. S. (2020). Movie Recommender System Using Collaborative Filtering. *2020 International Conference on Electronics and Sustainable Communication Systems (ICESC)*, 415–420. https://doi.org/10.1109/ICESC48915.2020.9155879

Gupta, S., & Kant, V. (2020). An Aggregation Approach to Multi-Criteria Recommender System Using Genetic Programming. *Evolving Systems*, *11*(1), 29–44. https://doi.org/10.1007/s12530-019-09296-3

Hameed, M., & Naumann, F. (2020). Data Preparation. *ACM SIGMOD Record*, *49*(3), 18–29. https://doi.org/10.1145/3444831.3444835

He, X., Chen, T., Kan, M. Y., & Chen, X. (2015). TriRank. *Proceedings of the 24th ACM International on Conference on Information and Knowledge Management*, 1661–1670. https://doi.org/10.1145/2806416.2806504

Hou, R., Kong, Y. Q., Cai, B., & Liu, H. (2020). Unstructured Big Data Analysis Algorithm and Simulation of Internet of Things Based on Machine Learning. *Neural Computing and Applications*, *32*(10), 5399–5407. https://doi.org/10.1007/s00521-019-04682-z

Injadat, M., Moubayed, A., Nassif, A. B., & Shami, A. (2021). Machine Learning Towards Intelligent Systems: Applications, Challenges, and Opportunities. https://doi.org/10.1007/s10462-020-09948-w

Jannach, D., Pu, P., Ricci, F., & Zanker, M. (2022). Recommender systems: Trends and frontiers. In *AI Magazine* (Vol. 43, Issue 2, pp. 145–150). John Wiley and Sons Inc. https://doi.org/10.1002/aaai.12050

Lee, H. I., Choi, I. Y., Moon, H. S., & Kim, J. K. (2020). A Multi-Period Product Recommender System in Online Food Market Based on Recurrent Neural Networks. *Sustainability (Switzerland)*, *12*(3). https://doi.org/10.3390/su12030969

Li, Y., Wang, R., Nan, G., Li, D., & Li, M. (2021). A Personalized Paper Recommendation Method Considering Diverse User Preferences. *Decision Support Systems*, *146*. https://doi.org/10.1016/j.dss.2021.113546

Patoulia, A. A., Kiourtis, A., Mavrogiorgou, A., & Kyriazis, D. (2022). A Comparative Study of Collaborative Filtering in Product Recommendation. *Emerging Science Journal*, *7*(1), 1–15. https://doi.org/10.28991/ESJ-2023-07-01-01

Prabowo, A., Ula, S. M., Syalsabila, A., Prabowo, F. S., Jati, D. K., & Mulana, L. (2021). *Indonesia Tourism Destination.* https://www.kaggle.com/datasets/aprabowo/indonesia-tourism-destination/data

Putri, A. K., & Suliadi. (2023). Rekomendasi Destinasi Wisata di Indonesia Menggunakan Metode Item2Vec. *Jurnal Riset Statistika*, 11–18. https://doi.org/10.29313/jrs.v3i1.1770

Sánchez-Corcuera, R., Casado-Mansilla, D., Borges, C. E., & López-de-Ipiña, D. (2024). Persuasion-Based Recommender System Ensambling Matrix Factorisation and Active Learning Models. *Personal and Ubiquitous Computing*, *28*(1), 247–257. https://doi.org/10.1007/s00779-020-01382-7

Shan, Z. P., Lei, Y. Q., Zhang, D. F., & Zhou, J. (2019). NASM: Nonlinearly Attentive Similarity Model for Recommendation System via Locally Attentive Embedding. *IEEE Access*, *7*, 70689–70700. https://doi.org/10.1109/ACCESS.2019.2916938

Sharma, S., Rana, V., & Malhotra, M. (2022). Automatic Recommendation System Based on Hybrid Filtering Algorithm. *Education and Information Technologies*, *27*(2), 1523–1538. https://doi.org/10.1007/s10639-021-10643-8

Stalidis, G., Karaveli, I., Diamantaras, K., Delianidi, M., Christantonis, K., Tektonidis, D., Katsalis, A., & Salampasis, M. (2023). Recommendation Systems for E-Shopping: Review of Techniques for Retail and Sustainable Marketing. In *Sustainability (Switzerland)* (Vol. 15, Issue 23). Multidisciplinary Digital Publishing Institute (MDPI). https://doi.org/10.3390/su152316151

Tahmasbi, H., Jalali, M., & Shakeri, H. (2021). Modeling User Preference Dynamics with Coupled Tensor Factorization for Social Media recommendation. *Journal of Ambient Intelligence and Humanized Computing*, *12*(10), 9693–9712. https://doi.org/10.1007/s12652-020-02714-4

Tareq, S. U., Noor, M. H., & Bepery, C. (2020). Framework of Dynamic Recommendation System for E-shopping. *International Journal of Information Technology*, *12*(1), 135–140. https://doi.org/10.1007/s41870-019-00388-6

Wadi, H. (2021). *Implementasi Jaringan Syaraf Tiruan Backpropagation Menggunakan MATLAB GUI* (3rd ed.).

Wang, L., Mistry, S., Hasan, A. A., Hassan, A. O., Islam, Y., & Junior Osei, F. A. (2023). Implementation of a Collaborative Recommendation System Based on Multi-Clustering. *Mathematics*, *11*(6). https://doi.org/10.3390/math11061346

Article history: Received: 11.02.2025 Revised: 15.05.2025 Accepted: 06.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1189-1196
DOI 10.30892/gtg.602spl16-1492

LABOUR SKILLS AND CULTURAL COMPETENCE IN THE HOTEL SECTOR IN PERU: INSIGHTS FROM FRONTLINE EMPLOYEES

Katty Antonela GELACIO-MACEDO [1], Fiorella Amelia OROZCO-SIBILLE [1], Franklin CORDOVA-BUIZA [2*], Miguel Jesús MEDINA-VIRUEL [3]

[1] Universidad Peruana de Ciencias Aplicadas, Faculty of Hotel and Tourism Management, Lima, Peru; u201615891@upc.edu.pe (K.A.G.M.); fiorella.orozco@upc.pe (F.A.O.S.)
[2] Universidad Privada del Norte, Research, Innovation and Sustainability Department, Lima, Peru; franklin.cordova@upn.edu.pe (F.C.B.)
[3] University of Cordoba, Department of Applied Economics, Faculty of Labour Sciences, Córdoba, Spain; Andalusian Institute for Research and Innovation in Toursim, Spain; mjmedina@uco.es (M.J.M.V.)

Citation: Gelacio-Alcedo, K.A., Orozco-Sibille, F.A., Cordova-Buiza, F., & Medina-Viruel, M.J. (2025). Labour skills and cultural competence in the hotel sector in Peru: Insights from frontline employees. *Geojournal of Tourism and Geosites*, 60(2spl), 1189–1196. https://doi.org/10.30892/gtg.602spl16-1492

Abstract: This study explores the job competencies required of front-line employees in four-star hotels in Lima, Peru, situating these skills within the cultural dynamics of hospitality work. In global tourism contexts, hotel service involves not only operational efficiency, but also the fulfilment of social expectations, emotional management and the demonstration of culturally appropriate behaviours. Through a qualitative approach, based on in-depth interviews with human resource managers, the research analyses the knowledge, skills, attitudes and experiences that define effective performance in hotel operations. The results show that employees must possess not only technical knowledge, but also key interpersonal competencies such as advanced English proficiency, teamwork, autonomy, leadership and adaptability. Likewise, knowledge associated with the use of hotel technologies, management systems, customer service and conflict resolution are identified as relevant. These competencies are not only functional, but also represent expressions of internalised cultural values, such as empathy, charisma and service-mindedness, which shape the symbolic relationships between employees and guests. The research shows that structural changes following the pandemic have reshaped job profiles, requiring greater versatility, role rotation and flexible planning. These transformations reinforce the need for culturally sensitive competencies, able to adjust to global institutional standards and local interaction practices. In this sense, the training of workers acquires a double dimension: technical and symbolic, where service not only satisfies functional needs, but also cultural expectations deeply rooted in the tourist experience. In conclusion, this study contributes to cultural studies applied to tourism by showing that labour competencies in the urban hotel sector not only respond to organisational demands, but also act as vehicles of cultural significance. The work of contact employees becomes a form of symbolic mediation that transmits values, norms and aesthetics of local service in internationalised contexts. The findings offer strategic orientations for human talent management and open up lines of future research on the crossover between labour competencies and cultural representations in the tourism industry.

Keywords: professional competence, job skills, attitudes, professional background, hotel industry, tourism, people management

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INTRODUCTION

Human capital management in organizations has not always focused on the competencies of their employees or their development. During the first industrial revolution, the demand for low-skilled labor to perform simple tasks predominated (Ruetzler et al., 2014). However, after World War II, employees began to be seen not only as mere production resources but as human beings with potential (Becker & Bish, 2021). Over time, human factor management has undergone several transformations, moving from an operational approach focused on executing tasks to a more strategic role. In this context, the competency-based approach has become a path to competitiveness (Jung & Yoon, 2016; Zegarra-Alva et al., 2024). Thus, the evolution of management, together with globalization and changes in the business environment, has led organizations to focus on the search for and development of an increasingly competent human resource (Gutiérrez-Aguilar et al., 2023; Rivero & Dabos, 2017; Mamani-Ildefonso et al., 2023).

The hotel sector is a key component for developing tourism activity, as it satisfies one of the most fundamental needs: accommodation. Over time, this sector has not been oblivious to the evolution in human talent management (Alberca & Parte, 2013). Given that it requires highly competent professionals and organizations that foster the development of labor skills through training, learning, and experiences (Cotos-Gamarra et al., 2023; Stangl et al., 2024;), it is essential in an area where customer experience is closely related to their degree of satisfaction. This satisfaction, in turn, impacts the customer's return to the destination and their economic contribution (Charaja & Mamani, 2013). Furthermore, in hotel environments shaped by international tourism, frontline competencies also carry

* Corresponding author

cultural meaning. The way workers greet, communicate, and manage emotions reflects local norms of hospitality and service, contributing to the symbolic construction of guest experiences.

The COVID-19 pandemic triggered organizational changes in all sectors, leading to a new rethink in human talent management (Hao et al., 2020). Hotels, like other businesses, were forced to implement innovative processes and demand new competencies from their workforce, such as adaptation to change, innovation, communication, and leadership (Huang et al., 2021; 2021, Ticona-Huanca et al., 2023). Within a hotel workforce, frontline employees are critical, as they interact directly with guests and face a significant emotional burden due to the nature of their work (Karatepe & Uludag, 2008). This burden is intensified in situations of pressure or conflict, being precisely in these moments where job competencies are crucial for the collaborator to be able to react quickly and assertively (Cerezo et al., 2018).

Various theories have been written in the scientific literature on work competencies and their types, such as transversal competencies that focus on adaptation throughout life, and developing their learning in the workplace in a better way (La Torre-Torres et al., 2022; Pineda & Fusté, 2023). Communicative competencies, focused on the organizational climate of the company to strengthen group relations and are manifested through individual characteristics and qualities acquired in the environment to be able to communicate efficiently (Elche et al., 2020) and digital competencies that influence the generation of knowledge through the use of technological tools (García & García, 2020; Kinczel et al., 2025).

In this regard, the International Labor Organization states that competence is an effective ability to successfully carry out a fully identified work activity (Sonnenberg et al., 2014). Along these lines, Duque et al. (2017), states that labor competencies are a set of factors that are associated with success in people's performance, which means having all the necessary tools to carry out a job, including knowledge, skills and attitudes. For this research, reference is made to the definition by Martínez (2013), who points out that work competencies allow people to perform their tasks with high performance through knowledge, skills, attitudes, and experiences so that we can specify that these are acquired through observation, learning, work experience and the practice that the employee has in the workplace.

Flores & Vargas (2019) define knowledge as the understanding of a set of specific responsibilities for a job, (Stangl et al., 2024) points out that it is the conscious and intentional act of learning about the object. This means knowing a language other than one's native language and facilitating communication with people from different backgrounds (Zhong & Pan, 2022). Another example is the handling of hotel systems which allows time-saving and efficient recording of work (Agina et al., 2024). On the other hand, skills are learned through vocational training or on-the-job experience (Bisson et al., 2024), among the most important of which are teamwork (Gonzales, 2024), leadership, applied in some hotel companies under a transformational and transactional approach as it allows for the evaluation of professional performance (Alves et al., 2012) and internal communication, which is applied in most hotels because it has a positive influence (Cordova-Buiza et al., 2022; Al-Azab & Al-Romeedy, 2024).

Attitudes are manifested in the behavior of individuals and are a process subject to change, whether positive or negative (Hu et al., 2020; Mamani-Ildefonso et al., 2023). That said, the service sector is looking for employees who have a positive attitude, are friendly, and can help with any guest needs (Bisson et al., 2024; Hochschild (1983). Finally, work experiences are formed through internships where they are linked to other professionals (Cain et al., 2024). In the hotel sector, employers look for people with experience to be able to perform the required job position, with an estimated time of 6 months to 1 year, as this will help the employee to adapt to their new job (Garazi, 2020).

The scientific literature presents various background information on job competencies in the hotel sector, with a special focus on managerial positions. According to Elbayoumi et al. (2021), in situations of uncertainty, job competencies enable employees not only to assume responsibilities but also to make effective decisions that can make a difference in organizational performance. In addition, it is essential to consider the key competencies that employees with the most contact with guests should possess. These competencies include not only service orientation but also interpersonal skills, the ability to work in teams, creativity, and innovation (Efstathiades et al., 2021). Despite the importance of these skills, many companies in the hospitality sector still face the challenge that their employees have not fully developed these competencies. This lack of development negatively impacts the quality perceived by customers and limits staff career growth opportunities (Stoyanova et al., 2020; Engelsberger et al., 2023).

Along the same lines, a study by Agina et al. (2024) highlights that hotel employees are fundamental elements in the provision of service. The competencies they possess not only influence their daily performance but also significantly affect the perception of the quality of the service offered. Investing in staff training and skills development not only improves customer satisfaction but also contributes to the long-term sustainability and success of hotel organizations in an increasingly competitive environment. Thus, the general objective of this research is to determine the job competencies that front-line staff in 4-star hotels in Lima need in order to carry out their functions efficiently. To this end, the specific objectives were established: (1) to identify the knowledge that front-line staff in 4-star hotels in San Isidro need to develop in order to perform their functions efficiently, (2) to describe the skills that front-line staff in 4-star hotels in San Isidro need to develop in order to perform their functions efficiently, (3) identify the attitudes that front-line staff of 4-star hotels in San Isidro need to develop in order to perform their duties efficiently, (4) describe the experiences that front-line staff of 4-star hotels in San Isidro need to develop in order to perform their duties efficiently.

MATERIALS AND METHODS

This research has a qualitative approach and is descriptive, as it describes and interprets the work competencies that front-line hotel staff need to develop to perform their work efficiently. For this purpose, in-depth interviews were carried out, which allowed for a content analysis of events and activities that cannot be directly observed (Korstjens & Moser, 2018), thus facilitating data collection for an exhaustive analysis of the information obtained. In addition, the study presents a non-probabilistic design, which allows for a detailed exploration of participants' experiences, perceptions, and opinions about changing contexts, such as the restructuring of job profiles following circumstances such as the COVID-19 pandemic (Kaushal & Srivastava, 2021). This approach allows us to understand, from the perspective of HR managers, the competencies that front-line Front Office, Housekeeping, and Food & Beverage staff in a four-star hotel need to develop to perform their work efficiently in the aftermath of the recent health crisis.

The study focuses on managers or human resources managers of four-star hotels located in the district of San Isidro in Lima, Peru. This geographical area is home to the main financial center, which is why it is the second district with the second highest number of four-star hotels. The sample size was determined by purposive sampling, which implies that, in a qualitative study, the quality of the informants is a priority, without following a strict rule on sample size; it all depends on the context of the research (Arrogante, 2022). For this study, six human resources managers with experience between 8 and 12 years were interviewed in order to collect information on the job competencies of frontline staff in the operational areas: Front Office, Housekeeping, and Food and Beverage.

The in-depth interviews were conducted using a 20-question guide, developed from four categories: knowledge, skills, attitudes, and experience, which emerged from the theoretical analysis. It is important to note that the guide was subjected to expert judgment, including a specialist in human resources and organizational culture, as well as an expert in qualitative methodology. Each interview was conducted in approximately 40 minutes through video calls using the Zoom platform. For the analysis and data collection, the data must maintain the external and internal validity of the study (Hernán et al., 2021). Therefore, a content analysis was conducted based on the transcripts.

The information was classified and coded according to the previously identified categories: knowledge, skills, attitudes, and experience. To organize the information more effectively, NVivo software was used. The six interviewees agreed voluntarily and gave their consent to be recorded; subsequently, the interviews were transcribed.

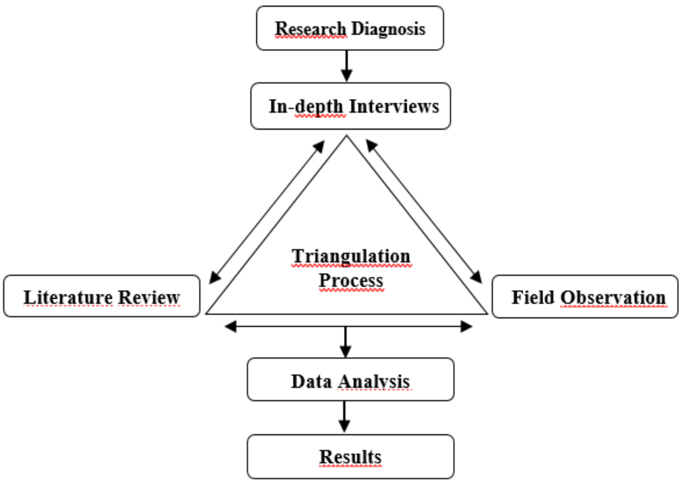

Figure 1. Qualitative analysis process

RESULTS

This section presents the findings from the analysis of the qualitative information from the six interviews. It should be emphasized that this research has made it possible to ascertain the work competencies that front-line staff in the areas of front office operations, housekeeping, and food, and beverage in 4-star hotels in San Isidro require to carry out their work efficiently. In terms of knowledge, interviewees stated that front-line employees in the operational areas: Housekeeping, Food and Beverage, and Front Office should have an advanced level of English language skills, as the city of Lima focuses on a corporate guest segment that mostly comes from the United States.

In addition, they highlight the organizational changes linked to the restructuring of positions, which they have incurred as a result of the pandemic, have led to the implementation of more complete positions, for which a more versatile profile is required. For the same reason that in hotels, occupancy is subject to the seasons, so employees are more mobile, i.e. if a hostess used to work only in this position, today she can also cover server positions or register room service orders, and these positions require a higher level of English than the hostess position.

[...] With the post-pandemic, what has changed, for example, is that now the positions are more complete, which means, for example, that at the front desk, a person can rotate in reception, in-room service, concierge, who can cover when there is, for example, occupation is not the same every day, there are peaks of occupation, and so what you gain, that versatility in your work. [...] (HO003).

In addition, fluency in English ensures that the front-line employee can prevent a language limitation from causing mistakes or delays when providing the service or, by performing a guest-facing function, has the opportunity to improve the customer experience and a good command of the language is decisive in this situation.

[...] Simply if you do not have the level, for example, you will not be able to recover a customer in the guest satisfaction indexes, the fact of not making a service order for example in a room service well done, will generate dissatisfaction for example if you do not understand it then the customer despairs, it is the most normal thing or when you organize an event in the case of AYB, you have to be very quick and very attentive, you do not have to be repeating things [...] (HO001).

Another aspect linked to knowledge is the handling of technologies including the use of hotel programs such as Opera, platforms such as GXP (Guest Experience Platform), customer service, Microsoft Office programs, use of social networks, among others. This is a skill that is valuable because it helps to be faster and influences the employee's performance. However, knowledge of hotel systems is not significant as the employee learns how to use them on a day-to-day basis.

[...] Yes... well, I think that in addition to computer programs such as Excel, PowerPoint, and Word, these are systems that are taken for granted as being within the employee's domain, maybe they can handle a hotel system, such as Opera, but let's say that it is not something relevant either, you learn that on a day-to-day basis (HO 002).

A third aspect linked to knowledge is that of customer service, the managers interviewed highlighted the importance for customer-facing employees to know good customer service practices, as they must be trained to handle any type of situation. This element is directly related to English language skills, as it allows an employee to be more efficient, faster, and more agile in service because he/she understands what the customer wants or needs, and also allows the employee to recover on time, the customer satisfaction that may have been affected by a bad experience.

[...] Ujum ok ... Well, the person has to be very correct, very polite, very courteous, very honest, it has to run through their veins, something like that, in wanting to help, in wanting to serve, in wanting to work in a team, that is a little bit of the profile, isn't it? that they are trained, because in a hotel different things happen every day, and training gives security in terms of being able to make decisions. [...] (HO001).

With regard to skills, the interviewees highlighted leadership, pointing out that nowadays, leadership is needed in all positions and is no longer exclusive to those who occupy managerial positions. A facilitating leadership style predominates, which empowers its collaborators, gradually promoting their autonomy, conditioned to their capacity and motivation.

[...] The aim is to take leadership to all positions, regardless of whether you have them or not, to generate a utonomy, promote initiative, and promote an environment of psychological security that allows confidence [...] (HO004).

In addition, autonomy and empowerment are promoted so that the employee can make decisions, depending on their level, with full security and confidence, either to solve a complaint or conflict or to positively impact the guest's experience.

[...] If what I think the added value to each of the collaborators is the autonomy that they manage, I am not going to criticize or call attention if the person has done something for their guest haaa ehhh, that implies making an attentive gesture suddenly having the opportunity to say by laaaa a courtesy, of course, having the resources that are allowed [...] (HO004).

Finally, in this category, the interviewees agreed on the importance of teamwork, as it allows for overcoming individual performance, customer satisfaction, and generating a favorable experience, involving different areas.

[...] Well... in the case of teamwork in truth mm.... it is always in the daily tasks ehh what we look for is that each task is not very individual. Still, in truth it has to be done, but that always there is some type of collaboration to a companion, some leader ehh..., for that reason always it is looked for that it is possible to coordinate, to work in team in the daily tasks, in the extra or additional activities to the role looking that all are aligned to the objectives that we handle like company (HO002).

Concerning attitudes, interviewees referred to charisma as the essential attitude that an employee should have when attending to a guest, as a good welcome with a smile conveys confidence and comfort to the guest.

[... We have employees who have been with us for more than 20 years and have come to have a genuine connection with the guests, we have old guests who return and seek the attention of a certain waiter, a certain waitress, if you achieve that genuine connection, generate confidence, your positive, welcoming attitude, then the guest returns not only for the services we provide but mainly for the quality of the attention and the charisma of the employees (HO005).

Interviewees also stressed that adaptability to the post-pandemic working environment is indispensable. New ways of planning have been implemented, for example, timetables, as these are subject to demand and efficiency in the operation.

[...] we have to move in other ways, for example by splitting timetables to be able to cover the operation. Learn to work with contingency, but know how to plan. They have to be more agile as there are new routines such as split schedules and 5x2 routines, i.e. they work 5 days and rest 2 to make an operational shift disappear [...] (HO004).

With regard to professional experience, all the interviewees mentioned that employees should have between six months and one year of experience in the hotel sector, not necessarily in hotels of a higher category, but in establishments of a lower category or of another classification, highlighting experience as a fundamental element to carry out their functions efficiently.

[...]' Well, perhaps this will depend on the position for which they are applying, there are positions that require a little more knowledge or ehh of mastery of some area, especially administrative areas, but if we are talking about operational areas, perhaps half a year, one year could be considered, and not necessarily in 4 or 5-star hotels, it could be in lower category hotels, I think that ehhh compensates a lot the issue of attitude, the attitude and the competencies that the person has' (HO003).

The results show that, in San Isidro's 4-star hotels, labour competencies have adapted to the post-pandemic environment, highlighting English proficiency, technology management, and good customer service practices as essential for efficient service. In addition, skills such as leadership, teamwork and adaptability are key to responding to the versatility required in operations. Finally, charisma, a vocation for service, and a minimum experience of six months complement the ideal profile, oriented towards efficiency and customer satisfaction.

DISCUSSION

The importance of English language proficiency among frontline employees is highlighted, in line with Giménez (2015) who argue that the expansion and globalisation of international tourism has led to the use of English as a lingua franca in hotel and tourism environments, and that tourists from different countries speak English in order to be able to communicate fluently. On the other hand, according to Mincetur (2019), 72% of foreign tourists visited Lima and come mostly from the United States. In the same way, a command of English enables a person to communicate effectively in all possible situations that may arise. These studies support what interviewees have mentioned when referring to the value of language proficiency in circumstances to retain guests or handle complaints (Berry, 2024).

Regarding the management of hotel software, softwares, and other platforms, a study by Iranmanesh et al. (2022) states that efficient management of the hotel system is important for the front desk position. This is in line with the interviewees' statement that the position demands a system. However, this competence is acquired or reinforced in the performance of the position. Similarly, Berné et al. (2011), in one of their studies, point out that automation and hotel systems allow time optimization, a statement that coincides with what was stated by the interviewees.

Regarding customer service, it is vital that the hotel provides training to improve in this aspect, and, ideally, the employee knows these issues to apply them safely to have a positive impact on guest satisfaction (Garrido et al., 2024). This statement coincides with what was pointed out by the interviewees, where they emphasize the commitment of the companies to train their employees on issues related to customer service.

In terms of leadership, some hotels opt for conventional leadership that focuses on bringing authority from managers so that employees can follow established orders, to enhance capabilities and avoid conflict (Appio et al., 2022). In this line, a study by Durán & Parra (2021), points out that when leaders exercise an inflexible and directive method of supervision, the work environment is rigid, which leads to high risks. On the other hand, interviewees have pointed out that bringing leadership to the various positions gives autonomy to employees, and is not an exclusive characteristic for management positions, but also for employees in middle management, who accept a culture of leadership in a favorable way and recognize that they are part of a company that is oriented towards competitiveness (Cruz et al., 2017). In this sense, we can point out that the style that predominates from the interviews conducted is facilitative leadership which creates a collaborative, resilient, and adaptable environment for change. Considering that any situation of conflict or complaint with the guest must be resolved in a short time, staff must have the ability to provide a prompt solution within their working day (Borzillo et al., 2021). For this to happen, it is essential, according to the interviewees, to give the employee the autonomy to make decisions with confidence, without fear of being reprimanded or reprimanded.

As for teamwork, it is fundamental because it exercises leadership in the organization and generates confidence when it comes to carrying out work tasks. Therefore, most managers look for people who are committed to collaborate not only with their functions but with all members of the work team (Jung & Yoon, 2016). This statement is consistent with the above and is in line with the facilitative leadership mentioned above.

Charisma is a positive attitude and this generates a motivated work environment, therefore, the profile of an employee must have a vocation for service and be charismatic when serving a guest, since good service results in a happy return of the guest to his or her destination (Agina et al., 2025). This is consistent with what the collaborators indicated when referring to the impact of charisma on guest satisfaction.

Likewise, according to the interviewees, most employees in the hotel sector have to have the ability to adapt to the work environment, for example, in the reception area the shifts are rotating, so the employee has to adapt to the schedule that will be provided or if sometimes they need to stay more hours (Balkin & Werner, 2023).

Finally, interviewees have referred to the value of experience as part of job competence and that this is estimated in a range of 6 months to 1 year for first line positions in the areas of housekeeping, front office and food and beverage. They have also mentioned that when the employee does not have the mentioned experience, then attitude is taken into account. In this sense, hotel employees must have experience when applying for the different areas; however, there may be employees with less experience, but they have the commitment to identify with the company and the desire to learn; therefore, it is valued that they have the initiative to learn in depth their functions (Chen et al., 2023).

Among the limitations of this study, the scarcity of research articles from Latin America or realities similar to those of Peru that specifically address labor competencies in the accommodation sector stands out. This lack of relevant literature makes it difficult to contextualize the findings within a broader theoretical framework. In addition, there was significant difficulty in gaining access to managers or those responsible for the Human Resources areas in the accommodation companies, which limited the number of interviews and, therefore, the diversity of perspectives in data collection.

It is therefore recommended that future research should include a larger and more representative sample, covering different types of hotel establishments and different geographical locations. This would provide a more complete picture of the labor skills needed in the sector. It would also be valuable to consider quantitative approaches to complement the qualitative findings, as well as longitudinal studies to observe the evolution of these competences over time and in response to changes in the work environment. These competencies not only enhance service efficiency but also represent cultural scripts that frame how hospitality is perceived and delivered in urban tourism settings.

CONCLUSION

The general objective of this research was to determine the job competencies that front-line staff in four-star hotels in Lima need to perform their duties efficiently. Throughout the study, the most recurrent competencies were identified, among which English language proficiency at an advanced level for all positions stands out.

This is due to the fact that, following the restructuring of the areas and considering the current demand, the job profiles are more horizontal and cover new tasks. In this sense, English proficiency facilitates more agile communication and allows employees to regain customer satisfaction. In terms of skills, the most frequently mentioned are leadership and autonomy. This ability is related to the degree of self-confidence of the operations employee. Moreover, leadership is no longer a quality exclusive to those in managerial roles. The results of this research indicate that organizations are particularly interested in developing leadership at all levels in order to foster autonomous decision-making and to handle difficult situations in a proactive, efficient, and timely manner.

On the other hand, adaptability to the job was identified as a relevant attitude. The post-pandemic has generated changes in work planning, requiring greater agility and implementation of new forms of operation. In this context, time planning has evolved, adopting modalities such as 5x2, where five days are worked in a row and two are rested, which eliminates a traditional operational shift. Finally, professional experience in the hotel sector is essential.

For front-line positions in the operational areas, a minimum of six months of experience is required, without the need to have worked in higher-category establishments. However, when the applicant lacks this experience, attitude becomes a particularly important factor. This research makes a significant contribution to both the hotel sector and the scientific literature by identifying and analyzing the essential job competencies for front-line staff in four-star hotels. The findings fill gaps in the literature by providing an up-to-date overview of the skills, attitudes, and knowledge needed in a post-pandemic context. Furthermore, these contributions are useful for human resources departments by allowing the optimization of selection, training, and professional development processes, promoting a more strategic talent management, aligned with current market demands and the well-being of employees.

With a view to future lines of research, it is recommended that the scope of the analysis be broadened to other job profiles in the sector, such as managers and directors, to explore how competencies vary according to hierarchical position. It would also be relevant to conduct comparative studies between different hotel categories or regions, which would allow for the identification of general trends and specific adaptations. Such explorations could strengthen the sector's capacity to respond to global challenges and contribute to the sustainable development of the hotel industry. This study highlights how labour competencies in hospitality also function as vehicles for expressing cultural values and professional identity in the context of international tourism.

Author Contributions: Conceptualization, K.G.M. and F.O.S.; methodology, F.C.B. and M.M.V.; software, K.G.M.; validation, F.O.S.; formal analysis, M.M.V. and K.G.M.; investigation, K.G.M..; data curation, M.R.P. and C.S.G.; writing - original draft preparation, M.M.V. and F.C.B.; writing - review and editing, F.O.S.; visualization, M.M.V. and M.M.V.; supervision, M.M.V.; project administration, F.O.S. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgements: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Agina, M. F., Farrag, D. A., Jaber, H. M., Fayyad, S., Abbas, T. M., Salameh, A. A., & Elziny, M. N. (2025). The influence of customer incivility on hotel frontline employees'responses and service sabotage: does co-worker support matter? *GeoJournal of Tourism & Geosites*, 58(1). https://doi.org/10.30892/gtg.58108-1393

Agina, M. F., Farrag, D. A., Khairy, H. A., Alhemimah, A., & Al-Romeedy, B. S. (2024). Talent management and innovative work behavior in tourism and hospitality businesses: Does absorptive capacity matter? *Journal of Human Resources in Hospitality & Tourism*, 24(2), 367-39. https://doi.org/10.1080/15332845.2025.2432621

Al-Azab, M. R., & Al-Romeedy, B. S. (2024). Servant leadership and tourism businesses' outcomes: a multiple mediation model. *Tourism Review*, 79(1), 184-204. https://doi.org/10.1108/TR-11-2022-0538

Alberca, P., & Parte, S. (2013). Evaluación de la eficiencia y la productividad en el sector hotelero español: un análisis regional (Assessing efficiency and productivity in the Spanish hotel sector: a regional análisis). *Investigaciones Europeas de Dirección y Economía de la Empresa,* 19(1),102-111. https://doi.org/10.1016/j.iedee.2012.10.004

Alves, T., Duarte, M., & Das, M. (2012). Competencias y habilidades necesarias de los gestores de hoteles de lujo y superlujo: Un estudio de caso en el Polo Turístico Via Costeira, Natal, Brasil (Competencies and skills required of luxury and super luxury hotel managers: A case study in the Via Costeira Tourism Pole, Natal, Brazil). *Estudios y perspectivas del turismo,* 21(3), 604-620.

Appio, F., Bernhard, F., Donate, M., & Mohíno, M. (2022). Dealing with knowledge hiding to improve innovation capabilities in the hotel industry: The unconventional role of knowledge-oriented leadership. *Journal of Business Research*, 144(1), 572-586. https://doi.org/10.1016/j.jbusres.2022.02.001

Arrogante, O. (2022). Sampling techniques and sample size calculation: How and how many participants should I select for my research? *Enfermería Intensiva,* 33(1), 44-47. https://doi.org/10.1016/j.enfi.2021.03.004

Balkin, D., & Werner, S. (2023). Theorizing the relationship between discretionary employee benefits and individual performance. *Human Resource Management Review*, 33(1), 100901. https://doi.org/10.1016/j.hrmr.2022.100901

Becker, K., & Bish, A. (2021). A framework for understanding the role of unlearning in onboarding. *Human Resource Management Review*, 31(1), 100730. https://doi.org/10.1016/j.hrmr.2019.100730

Berné, C., García, M., García M. E., & Múgica, J. M. (2012). Modelling changes in the distribution system of the tourist sector due to the incorporation of technologies. *Notebooks on Economics and Business Management*, 15(3), 117-129. https://doi.org/10.1016/j.cede.2011.07.002

Berry, C. M. (2024). Personnel selection systems and diversity. *Current Opinion in Psychology*, 101905. https://doi.org/10.1016/j.copsyc.2024.101905

Bisson, A., Lee, C., Manfreda, A., Presbury, R., & Scerri, M. (2024). Conceptualizing the "Hospitable Service Mindset" for the future hospitality workforce. *Journal of Hospitality and Tourism Management*, 58(1), 115-128. https://doi.org/10.1016/j.jhtm.2023.12.003

Borzillo, S., Raub, S., Perretten, G., & Schmitt, A. (2021). New employee orientation, role-related stressors and conflict at work: Consequences for work attitudes and performance of hospitality employees. *International Journal of Hospitality Management*. 94, 102857.

Cain, L., Leung, X., Park, J., & Ponting, S. (2024). Impact of supervisor identity on hospitality employees' work intentions: Rethinking of social dominance and intersectionality theory. *Journal of Hospitality and Tourism Management*, 59(1), 49-59. https://doi.org/10.1016/j.jhtm.2024.03.011

Cerezo, M., Carbonell, R., Ferreirós, R., Hidalgo, B., & Lorenzo, M. (2018). Toolkit for professional competencies assessment of Medicine Laboratory specialists. *Revista clínica*, 11(2), 93-96. https://doi.org/10.1016/j.labcli.2017.09.004

Charaja, Y., & Mamani, J. (2013). Satisfacción Laboral y Motivación de los Trabajadores de la Dirección regional de Comercio Exterior y Turismo-Puno-Perú (Job Satisfaction and Motivation of the Workers of the Regional Directorate of Foreign Trade and Tourism-Puno-Peru.). *Revista de Investigación en Comunicación y Desarrollo*, 5(1), 5-13.

Chen, T., Wu, C., & Wang, Y. (2023). Formation of hotel employees' service innovation performance: Mechanism of thriving at work and change-oriented organizational citizenship behavior. *Journal of Hospitality and Tourism Management*, 54(1), 178-187. https://doi.org/10.1016/j.jhtm.2022.12.015

Cordova-Buiza, F., Aguirre-Parra, P., Garcia-Jimenez, M. G., & Martinez-Torres, D. C. (2022). Virtual leadership as a development opportunity in business context. *Problems and Perspectives in Management*, 20(2), 248-259. https://doi.org/10.21511/ppm.20(2).2022.20

Cotos-Gamarra, A., Ruelas-Salazar, M., Fernández-Hurtado, G., & Cordova-Buiza, F. (2023). The Influence of Job Stress on Employee Performance in Higher Education Institutions: A Review and Research Agenda, *IBIMA Business Review*, 141493. https://doi.org/10.5171/2023.141493

Cruz-Abarca, L., Ramírez, A. B., Taracena-Ruiz, E., & Castellanos-Simons, D. (2017). Configuración de la identidad profesional del asesor técnico pedagógico de educación básica (Shaping the professional identity of the technical educational advisor in basic education). *Diálogos sobre educación*, 8(14).

Duque, J., García, M., & Hurtado, A. (2017). Influence of emotional intelligence on job skills: An empirical study in employees at the administrative level. *Estudios Gerenciales*, 3(144), 250-260. https://doi.org/10.1016/j.estger.2017.06.005

Durán, S., & Parra, M. (2021). Liderazgo como prospectiva del clima organizacional en el sector hotelero (Leadership as a prospective of the organisational climate in the hotel industry). *Revista de Ciencias Sociales*, 27(2), 217-227. https://doi.org/10.31876/rcs.v27i2.35908

Efstathiades, A., Marneros, S., & Papa-Georgiou, G. (2021). Examining the core competencies for success in the hotel industry: The case of Cyprus. Journal of Hospitality*, Leisure, Sport & Tourism Education*, 28(1), 100303. https://doi.org/10.1016/j.jhlste.2021.100303

Elbayoumi, I., Elhkwesky, Z., Mohamed, A., & Mansour, K. (2021). The COVID-19 pandemic: The mitigating role of government and hotel support of hotel employees in Egyp. *Tourism Management*, 85(1), 104305. https://doi.org/10.1016/j.tourman.2021.104305

Elche, D., Ruiz, P., & Linuesa, J. (2020). Servant leadership and organizational citizenship behavior: the mediating effect of empathy and service climate. *International Journal of Contemporary Hospitality Management*, 32(6), 2035-2053. https://doi.org/10.1108/IJCHM-05-2019-0501

Engelsberger, A., Bartram, T., Cavanagh, J., Halvorsen, B., & Bogers, M. (2023). The role of collaborative human resource management in supporting open innovation: A multi-level model. *Human Resource Management Review*, 33(2), 100942. https://doi.org/10.1016/j.hrmr.2022.100942

Flores, M., & Vargas, S. (2019). Cultura organizacional y satisfacción laboral como predictores del desempeño laboral en bibliotecarios. *Investigación Bibliotecológica*, 33(79), 149-176. https://doi.org/10.22201/iibi.24488321xe.2019.79.57913

Garazi, D. (2020). Men, Services and Gender: Experiences and Representations of Work in the Hotel Sector (Mar del Plata, 1960-1990). *Secuencia*, 1(106), e1554. https://doi.org/10.18234/secuencia.v0i106.1554

García, J., & García, S. (2020). Uso de herramientas digitales para la docencia en España durante la pandemia por COVID-19. *Revista Española de Educación Comparada*. 38, 151-173. https://gredos.usal.es/bitstream/handle/10366/155868/27816-Texto%20del%20art%EDculo-72740-1-10-20210326.pdf?sequence=3

Garrido, P., Perdomo, V., & Sacristan, M. (2024). An fsQCA analysis of service quality for hotel customer satisfaction. *International Journal of Hospitality Management*, 112(1). https://doi.org/10.1016/j.ijhm.2024.103793

Giménez, D. (2015). Anglicisms in Tourism Language Corpora 2.0. *Procedia - Social and Behavioral Sciences*, 198, 149-156. https://doi.org/10.1016/j.sbspro.2015.07.431

Gonzales, S. (2024). Job characteristics in hospitality occupations. *Annals of Tourism Research*, 107(1). https://doi.org/10.1016/j.annals.2024.103792

Gutiérrez-Aguilar, O., Duche-Pérez, A., León-Lucano, J., Córdova-Buiza, F., de Manchego, V. T., & Chicaña-Huanca, S. (2023). Teaching Skills Mediated by Perceived Utility and Ease of Use in Student Motivation and Collaboration. *In International Conference on Communication and Applied Technologies*, 81-91, Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-99-7210-4_8

Hao, F., Xiao, Q., & Chon, K. (2020). COVID-19 and China's Hotel Industry: Impacts, a Disaster Management Framework, and Post-Pandemic Agenda. *International Journal of Hospitality Management*, 90, 102636. https://doi.org/10.1016/j.ijhm.2020.102636

Hernán, M., Lineros, C., & Ruiz, A. (2021). How to adapt qualitative research to confinement contexts. *Gaceta Sanitaria*, 35(3), 298-301. https://doi.org/10.1016/j.gaceta.2020.06.007

Hochschild, A. R. (1983). *The managed heart: Commercialization of human feeling*. University of California Press.

Hu, Y., Min, H., & Park, J. (2020). Toward understanding the attitude measurements in hospitality research. *International Journal of Hospitality Management*, 89(1), 102567. https://doi.org/10.1016/j.ijhm.2020.102567

Huang, A.Y., Fisher, T., Ding, H., & Guo, Z. (2021). A network analysis of cross-occupational skill transferability for the hospitality industry. *International Journal of Contemporary Hospitality Management*, 33(12), 4215-4236. https://doi.org/10.1108/IJCHM-01-2021-0073

Iranmanesh, M., Ghobakhloo, M., Nilashi, M., Tseng, M. L., Yadegaridehkordi, E., & Leung, N. (2022). Applications of disruptive digital technologies in hotel industry: A systematic review. *International Journal of Hospitality Management*, 107(1), 103304. https://doi.org/10.1016/j.ijhm.2022.103304

Jung, H. S., & Yoon, H. H. (2016). Why is employees' emotional intelligence important?: The effects of ei on stress-coping styles and job satisfaction in the hospitality industry. *International Journal of Contemporary Hospitality Management*, 28(8), 1649–1675. https://doi.org/10.1108/IJCHM-10-2014-0509

Karatepe, O. M., & Uludag, O. (2008). Role stress, burnout and their effects on frontline hotel employees' job performance: evidence from Northern Cyprus. *Int. J. Tourism Res*., 10, 111-126. https://doi.org/10.1002/jtr.645

Kaushal, V., & Srivastava, S. (2021). Hospitality and tourism industry amid COVID-19 pandemic: Perspectives on challenges and learnings from India. *International journal of hospitality management,* 92, 102707. https://doi.org/10.1016/j.ijhm.2020.102707

Kinczel, A., Lengyel, A., Pálinkás, R., Bácsné, É. B., & Müller, A. (2025). The influence of inside work and outside work well-being factors on actual and future travel destination choice. *Geo Journal of Tourism and Geosites*, 58(1), 176-187. https://doi.org/10.30892/gtg.58115-1400

Korstjens, I., & Moser, A. (2018). Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing. *European Journal of General Practice*, 24(1), 120-124. https://doi.org/10.1080/13814788.2017.1375092

La Torre-Torres, M. T., Pando-Medina, Z. M., Aragon-Ortega, P. M., & Cordova-Buiza, F. (2022). Administrative management and work performance in hardware and construction SMEs: The case of Justiniano Soto Villanueva S.R.L., Peru. *IBIMA Business Review*, 497769. https://doi.org/10.5171/2022.497769

Martínez, B. (2013). Evaluation of the use of skills work in construction industry in Mexico City (Evaluating the use of competency-based work in the construction industry in Mexico City). *Economía Informa*, 379(1). https://doi.org/10.1016/S0185-0849(13)71316-1

Mamani-Ildefonso, S. B., Quispe-Martinez, V. N., Cordova-Buiza, F., & Fernandez-Hurtado, G. A. (2023). Organizational Behavior in Small and Medium Enterprises: A Systematic Review and Future Research Agenda. *In 18th European Conference on Management Leadership and Governance*, 19(1), 240-248. https://doi.org/10.34190/ecmlg.19.1.1930

Pineda, M., & Fusté, F. (2023). Hotel management skills in times of crisis. *Investigaciones Turísticas*, (26), 114–133. https://doi.org/10.14198/INTURI.21337

Rivero, A. G., & Dabos, G. E. (2017). Human resources differential management: A review and an integration of the literature. *Estudios Gerenciales*, 33(142), 39-51. https://doi.org/10.1016/j.estger.2016.12.003

Ruetzler, T., Baker, W., Reynolds, D., Taylor, J., & Allen, B. (2014). Perceptions of technical skills required for successful management in the hospitality industry—An exploratory study using conjoint analysis. *International Journal of Hospitality Management*, 39, 157-164. https://doi.org/10.1016/j.ijhm.2014.02.012

Sonnenberg, M., van Zijderveld, V., & Brinks, M. (2014). The role of talent-perception incongruence in effective talent management. *Journal of World Business*, 49(2), 272-280. https://doi.org/10.1016/j.jwb.2013.11.011

Stangl, B., Li, Y., Ma, E., Xu, S., & Alsaied, M. (2024). Transferable skills in tourism and hospitality. *Annals of Tourism Research*. 109, 103854. https://doi.org/10.1016/j.annals.2024.103854.

Stoyanova, S., Paskova, T., & Buhalis, D. (2020). Emotional intelligence: a competitive advantage for tourism and hospitality managers. *Tourism Recreation Research*, 47 (4), 359–371. https://doi.org/10.1080/02508281.2020.1841377

Ticona-Huanca, K. M., Aguirre-Parra, P., & Cordova-Buiza, F. (2023). Internal Organizational Communication in Remote Work: An Analysis of Higher Education Entities. *IBIMA Business Review*, 2, 440546. https://doi.org/10.5171/2023.440546

Zegarra-Alva, M., Castañeda-Gil, Y., & Cordova-Buiza, F. (2024). Evaluation of specific competencies of university students in hospitality and gastronomy programs. *Knowledge and Performance Management*, 8(1), 149-162. https://doi.org/10.21511/kpm.08(1).2024.11

Zhong, W., & Pan, X. (2022). Teaching Spoken English for hospitality management major in China. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 22(1), 100375. https://doi.org/10.1016/j.jhlste.2022.100375

Article history: Received: 17.02.2025 Revised: 16.05.2025 Accepted: 09.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1197-1205
DOI 10.30892/gtg.602spl17-1493

THE IMPACT OF ECOTOURISM EFFICIENCY ON PROMOTING SUSTAINABLE TOURISM DEVELOPMENT IN THE NORTH CENTRAL REGION

Doan Van THANG [1], Pham Ngoc Kim KHANH [1*]

[1] Industrial University of Ho Chi Minh City, Faculty of Business Administration, Ho Chi Minh City, Vietnam; thangdv24761@pgr.iuh.edu.vn (D.V.T.);phamngockimkhanh@iuh.edu.vn (P.N.K.K.)

Citation: Thang, D.V., & Khanh, P.N.K. (2025). The impact of ecotourism efficiency on promoting sustainable tourism development in the North-Central region. *Geojournal of Tourism and Geosites*, 60(2spl), 1197–1205. https://doi.org/10.30892/gtg.602spl17-1493

Abstract: This study aims to evaluate the impact of ecotourism efficiency on sustainable tourism development in the North Central region of Vietnam. It emphasizes the interconnected relationships among natural resource conservation, community awareness, and local economic growth as essential pillars for building effective sustainability strategies. The research applies the PLS-SEM method, which is particularly well-suited for analyzing higher-order structural models. The study is carried out in two distinct phases: a qualitative phase for validating measurement scales and designing surveys based on prior literature, followed by a quantitative phase to examine lower-order constructs (LOCs) and re-estimate the model using higher-order constructs (HOCs) treated as first-order latent variables. All relationships in the model are statistically significant, confirming the robustness of the proposed framework. Among the influencing variables, Ecotourism Performance (TP) exerts the strongest effect on Sustainable Tourism Development (SDT), followed by Ecotourism Quality. The indirect effect analysis further confirms that all mediating relationships are significant. Ecotourism Quality plays a partial complementary mediating role, indicating that improving ecotourism efficiency not only has a direct effect on sustainability but also enhances ecotourism quality, which in turn supports sustainable development. The findings confirm that ecotourism efficiency is a key driver of environmental protection, cultural preservation, and economic growth in the region. Moreover, ecotourism contributes to raising environmental awareness among both tourists and local communities. It plays a vital role in job creation and income generation, particularly for ethnic minority populations. Ecotourism also supports the preservation and promotion of indigenous culture and traditional values, which are essential for long-term tourism sustainability. Furthermore, the rising demand for ecotourism fosters investment in green infrastructure, such as eco-friendly transport and accommodations that utilize renewable energy. The study also acknowledges several limitations, including the narrow geographical scope and the lack of assessment regarding long-term impacts. Future research is encouraged to expand to other regions, explore the influence of national policies on ecotourism development, and investigate the role of technology and innovation in advancing sustainable tourism practices.

Keywords: ecotourism, sustainable tourism development, cultural preservation, ecotourism quality, local economic growth

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INTRODUCTION

Central Vietnam is a vital center for cultural and ecological tourism in Vietnam, renowned for its globally recognized cultural and natural heritage systems. In recent years, numerous regional tourism brands have established their presence on both domestic and international tourism maps. However, to achieve significant breakthroughs in tourism development, it is imperative to foster strong collaboration among provinces in the region. Such cooperation could create a chain of unique and appealing tourism products, offering visitors distinctive and captivating experiences. According to the Vietnam National Administration of Tourism, the provinces of Nghe An, Thanh Hoa, Ha Tinh, Quang Binh, Quang Tri, and Thua Thien Hue have established a shared coordination framework for strategic and product development. The region currently hosts 234 tourism and travel service providers. Through these collaborations, inter-regional tourism chains like the “Central Heritage Route” and the “Central Vietnam Ecological and Spiritual Cultural Route” have emerged, leveraging local advantages to attract tourists. Despite these developments, tourism in the region remains predominantly focused on sightseeing and leisure, with limited emphasis on sustainable or ecological tourism.

This oversight is significant, given the region's abundance of national parks, diverse natural landscapes, and renowned ecological destinations. Researching ways to enhance the effectiveness of ecotourism in Central Vietnam is essential for its sustainable development. The area boasts an extensive array of unique natural and cultural resources. Against the backdrop of increasing environmental and social awareness, ecotourism has become an undeniable trend. Developing ecotourism not only yields economic benefits but also contributes to environmental protection, ecosystem preservation, and restoration.

Improving ecotourism effectiveness offers both short-term benefits and long-term opportunities for regional development. By strengthening sustainable resource management and utilization, the ecotourism sector in this region can deliver high-quality travel experiences, attract more visitors, and contribute to the economic and social growth of

[*] Corresponding author

Central Vietnam. Previous studies by Hoang et al. (2022) have not yet incorporated factors reflecting the effectiveness of implementing specific ecotourism models, such as sustainable management, community participation, or public–private partnerships, which may play a crucial role in enhancing tourist satisfaction and loyalty.

In addition, the lack of an in-depth investigation within a specific geographical area has limited the ability to identify distinct characteristics and localized impacts at individual ecotourism sites. Similarly, Hoang (2023) identified key elements of sustainable tourism development, including economic, social, and environmental factors, but did not delve into quality or ecological efficiency related to environmental conservation. Research by Wardana et al. (2021), Helmi & Naparin (2023), Khan et al. (2021) also highlighted factors influencing sustainable tourism development but lacked consistency in identifying the most critical factors and understanding their interactions. This inconsistency presents challenges in formulating a comprehensive and precise model for sustainable ecotourism.

Therefore, it is crucial to conduct further research to evaluate and comprehensively analyze the factors influencing ecotourism in Central Vietnam. Developing appropriate models to understand the relationships between these factors and proposing specific measures to promote sustainable development in the ecotourism sector are necessary steps. Addressing these challenges through targeted research will be pivotal for advancing tourism in this region.

LITERATURE REVIEW

1. Ecotourism

The International Ecotourism Society TIES (2015) defines ecotourism as "responsible travel to natural areas that conserves the environment, sustains the well-being of local people, and involves interpretation and education." Ecotourism is regarded as an effective tool for protecting natural environments by generating income, promoting environmental ethics and conservation education, and fostering the active participation of local communities (Ross & Wall, 1999). Ecotourism is regarded as a responsible form of travel to untouched natural areas that seeks to deepen environmental and cultural understanding while minimizing disruption to local ecosystems.

It not only supports environmental conservation efforts but also provides meaningful economic benefits to indigenous and local communities (Giao et al., 2021). Conservation and development efforts are undertaken within the framework of sustainability, taking into account economic, social, and environmental factors (Angessa et al., 2022). Thus, the development of ecotourism extends beyond environmental protection and conservation to include economic aspects, income generation, education, and the integration of local communities (Wardana et al., 2021).

2. Ecotourism performance

Ecotourism performance is a critical aspect in evaluating and measuring the outcomes of ecotourism activities. It is assessed not only through economic indicators such as revenue and profitability but also by incorporating environmental, social, and cultural factors Wardana et al (2021). The performance of ecotourism reflects the degree of success in ecotourism initiatives, and enhancing this performance is not only a fundamental goal but also key to ensuring the long-term sustainability of ecotourism (Franzoni, 2015; Ghoochani et al., 2020).

Wardana et al. (2021) further outline four dimensions for evaluating ecotourism performance: environmental conservation, service quality, economic development, and infrastructure and control. These dimensions underscore the comprehensive approach required to achieve balanced and sustainable ecotourism outcomes.

3. Sustainable tourism

According to the United Nations World Tourism Organization (UNWTO, 2005), "Sustainable tourism is tourism that meets the current needs of tourists and destinations while ensuring and enhancing resources for the future. It involves managing all resources to fulfill economic, social, and aesthetic needs while preserving cultural and environmental integrity." Similarly, Helmi & Naparin (2023) define sustainable tourism as a form of tourism that balances the needs of travelers with the protection of natural resources, culture, and local community livelihoods.

The primary objective is to minimize the negative impacts of tourism while balancing environmental protection, cultural integrity, social equity, and economic benefits. Sustainable tourism aims to meet the needs of local communities and improve their quality of life in both the short and long term (Hashemkhani Zolfani et al., 2015).

Based on these concepts, this study defines sustainable tourism as a type of tourism in which both tourists and local communities share responsibilities. The goal is to ensure long-term economic, cultural-social, and environmental sustainability for local communities while providing the highest level of satisfaction to tourists (Huang et al., 2023).

In the current context, sustainability in tourism is assessed based on three main pillars. First, economic sustainability requires stable economic growth, enabling the tourism sector to generate income and employment for local residents, thus improving living standards and promoting development based on community assets.

Second, environmental sustainability demands that economic and tourism development be paired with preserving natural landscapes and maintaining the balance of ecosystems. Third, cultural-social sustainability ensures that development does not erode local identity, preserves the authenticity and simplicity of the local populace, and promotes the conservation and enhancement of valuable cultural traditions in each region (Hoang, 2023).

4. Hypotheses

4.1. Ecotourism performance

Ecotourism performance focuses on measuring the results of environmental protection and maintenance efforts, while enhancing income, educational infrastructure, nature conservation, and the welfare of local communities, as well as preserving and developing the economy and infrastructure. Ecotourism often concentrates on the preservation and conservation of natural areas, creating unique experiences for tourists.

Destinations such as national parks, nature reserves, and primeval forests are not only attractive spots but also places where tourists can directly engage with nature and learn about biodiversity (Ghoochani et al., 2020).

Ecotourism frequently encourages interaction with the local community and culture. Tourists are often encouraged to participate in cultural activities such as local festivals, learning traditional crafts, or engaging in environmental conservation projects. These experiences not only enhance the uniqueness of the travel journey but also create meaningful and memorable experiences for the tourists. Therefore, the performance of ecotourism is evaluated from various perspectives. In ecotourism research, performance includes service quality, conservation, economic development, infrastructure, and control factors (Helmi & Naparin, 2023; Viera Trevisan et al., 2022).

Furthermore, ecotourism creates job opportunities and income for local communities, boosts economic development, and improves the quality of life. Promoting awareness and education about the value of the environment and local culture not only enriches the tourist experience but also fosters consensus and support from the community. Ecotourism activities often generate value chains and business opportunities for local enterprises, contributing to economic diversification and reducing dependence on other income sources (Ghoochani et al., 2020; Wardana et al., 2018; Viera Trevisan et al., 2022). The effectiveness of ecotourism not only enhances the quality of the tourist experience but also contributes to environmental conservation, respects local culture, and fosters community economic development. This implies that ecotourism plays a crucial role in building a sustainable and positive tourism industry. Based on the results of studies proving the relationships from the research of (Hashemkhani Zolfani et al., 2015; Helmi & Naparin, 2023; Wardana et al., 2021), the author proposes the following hypotheses:

Hypothesis H1: Ecotourism performance has a positive influence on Tourism Quality.

Hypothesis H2: Ecotourism performance has a positive influence on Sustainable Tourism Development.

4.2 Tourism quality

The quality of the travel experience can significantly influence the preservation and protection of local environments. According to Khan et al. (2021), service quality encompasses elements such as control, conservation, economic development, infrastructure, and tourism service quality. When tourism is managed professionally and responsibly, it often leads to minimizing negative environmental impacts. Moreover, through environmentally responsible tourism activities, such as ecotourism, visitors have the opportunity to learn about the value of environmental protection and local communities. Additionally, the quality of the travel experience affects the economic and social development of the area. When visitors enjoy unique and memorable experiences, they are likely to spend on local services, products, and tourism activities, contributing to the economic development of the community and improving the quality of life for local residents (Khan et al., 2021). Furthermore, previous research, particularly by Helmi & Naparin (2023) and Wardana et al. (2021), also highlights this relationship. Based on this, the author proposes the following hypothesis:

Hypothesis H3: Ecotourism quality positively impacts Sustainable Tourism Development.

Building upon Hypotheses H2 and H3, the author proposes the following indirect effect hypothesis:

Hypothesis H4: Tourism quality mediates the influence of ecotourism performance on Sustainable Tourism Development.

Based on the above analysis, the conceptual framework of this study is proposed as shown in Figure 1.

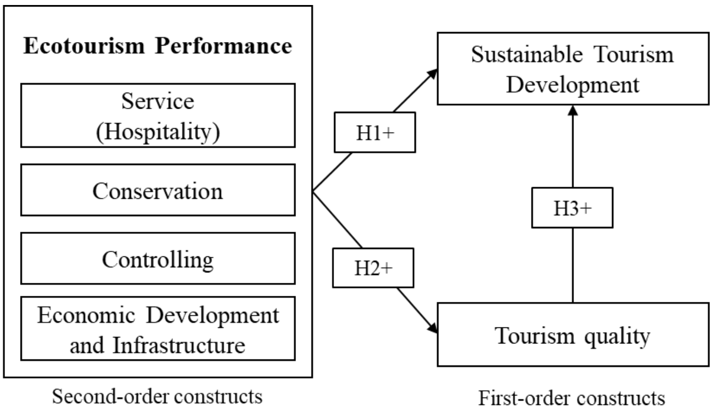

Figure 1. Conceptual framework (Note: CT: Controlling; CS: Conservation; EI: Economic Development and Infrastructure; SQ: Service (Hospitality) TP: Ecotourism Performance; TQ: Tourism Quality; STD: Sustainable Tourism Developmen)

RESEARCH METHOD

After synthesizing the literature review, consulting with experts, and referencing the theoretical framework, the majority of the proposed factors by the authors are found to be interrelated and collectively impact the development of sustainable tourism. Based on this foundation, the authors continue to build the research model based on the hypotheses outlined. In the proposed model, the factors are measured typically through PLS-SEM, with Ecotourism Performance being treated as a second-order variable. Hair et al. (2010) argue that to perform exploratory factor analysis (EFA) effectively, the sample size should be approximately 5 to 10 times the number of observed variables.

For regression analysis, according to Tabachnick & Fidell (2001), the minimum sample size should be calculated using the formula: 50 + 8 x m (where m is the number of independent variables), which, based on this formula, requires a sample size of 90 (50 + 8 x 5). However, to avoid complications and risks associated with distributing surveys via Google Forms and to ensure safety and reliability, the author has decided to select a sample size of 700. The collected surveys with valid data were processed and analyzed using SPSS 27.0 and SMART PLS 4 software.

This study conducts a quantitative model analysis using the PLS-SEM method. PLS-SEM is considered an appropriate choice for studies employing higher-order structural equation models. The study is conducted in two phases: qualitative and quantitative research. Phase 1: The qualitative study is conducted to identify and preliminarily test the measurement scales, serving as the foundation for constructing the questionnaire for the quantitative study. The author draws upon measurement scales from previous studies to build the questionnaire for the independent, mediating, and dependent variables. Phase 2: The quantitative study is carried out in two stages.

In the first stage, lower-order constructs (LOC) are examined in the structural model and are directly linked to other constructs without being mediated by higher-order constructs (HOC). In the second stage, the structural model is re-estimated, and second-order constructs become first-order constructs. Observed variables (LOC) are converted into latent variables, and explanatory constructs (HOC) become first-order latent variables.

RESULTS AND DISCUSSION

1. Respondent demographic profile

The characteristics of the study (Table 1) are reflected through the examination of demographic variables such as age, gender, education level, occupation, and income of the study participants. These details can provide a deeper understanding of the study population and the impact of demographic factors on the research. By analyzing the demographic variables of tourists participating in ecotourism in the North Central region, the study can identify trends and preferences among different age groups, occupations, income levels, and so on, regarding this type of tourism.

Table 1. Statistics demographic profile of respondents

		Frequency	**Percentage**
Gender	Male	338	47.08%
	Female	380	52.92%
Age	18 - 24 years old	161	22.42%
	25 - 30 years old	214	29.81%
	31 - 36 years old	291	40.53%
	Above 36 years old	52	7.24%
Occupation	Office worker	469	65.32%
	Civil servant/ public employee	153	21.31%
	Self-employed	96	13.37%
Income	Below 10 million VND	98	13.65%
	From 10 to 20 million VND	269	37.47%
	From 21 to 30 million VND	240	33.43%
	Above 30 million VND	111	15.46%

The sample consists of 718 respondents, with a balanced gender distribution of 338 males and 380 females. The age composition is diverse, with the majority aged 31–36 years (291 respondents), followed by 25–30 years (214 respondents), 18–24 years (161 respondents), and those above 36 years (52 respondents).

In terms of occupation, 469 respondents are office workers, 153 are civil servants or public employees, and 96 are self-employed. Income levels are varied, with 269 respondents earning between 10–20 million VND, 240 earning 21–30 million VND, 111 earning above 30 million VND, and 98 earning below 10 million VND. This diverse composition ensures the study captures a wide range of perspectives and experiences.

2. Model evaluation

2.1. Phase 1 model evaluation

According to Henseler et al. (2009), the outer loading factor coefficient should be greater than 0.7. Based on the results (Figure 2), it can be observed that all factor loading coefficients exceed the threshold of 0.7 (Henseler et al., 2009).

Therefore, all observed variables are significant in the model, and the LOC variables meet the conditions to proceed with the evaluation of other fit criteria. To draw the most accurate conclusions, the author evaluates the reliability based on three reliability indices: Cronbach's alpha, rho_A, and CR. The convergent validity of each factor was assessed through the CR index, which represents the composite reliability of each factor. The results in Table 2 show that all factors have CR values ranging from 0.916 to 0.947, exceeding the acceptable threshold of 0.7 (Hair et al., 2017).

For the Cronbach's Alpha reliability coefficient (Table 2), the factors range from 0.862 to 0.930, which aligns with the recommendation by Hair et al. (2010), with the value range of 0.7 < Cronbach's Alpha < 0.95. Finally, for the rho_A value, the factors range from 0.863 to 0.930, indicating high reliability of the observed variables in each factor (Sarstedt et al., 2019).

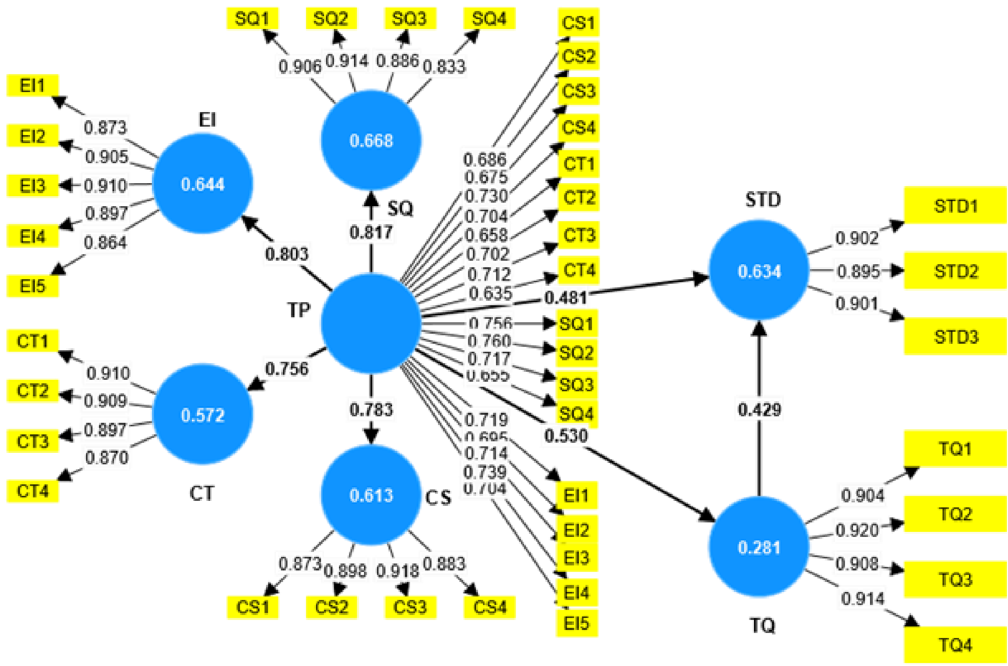

Figure 2. Results of the PLS-SEM Measurement Model for the LOC Variables Phase
(Note: CT: Controlling; CS: Conservation; EI: Economic Development and Infrastructure; SQ: Service (Hospitality)
TP: Ecotourism Performance; TQ: Tourism Quality; STD: Sustainable Tourism Development)

Discriminant validity testing of lower-order

The results in Table 3 show that the HTMT values are all < 0.85, meeting the criteria established by Henseler et al. (2015) to proceed with the subsequent tests.

Table 2. Evaluation of the Reliability of the LOC
(Note: CT: Controlling; CS: Conservation; EI: Economic Development and Infrastructure; SQ: Service (Hospitality)
TP: Ecotourism Performance; TQ: Tourism Quality; STD: Sustainable Tourism Development)

	Cronbach's Alpha	rho_A	CR	AVE
CS	0.909	0.910	0.936	0.786
CT	0.899	0.902	0.930	0.768
EI	0.930	0.930	0.947	0.782
SQ	0.897	0.900	0.928	0.764
STD	0.862	0.863	0.916	0.784
TQ	0.924	0.927	0.946	0.813

Table 3. Results Discriminant Validity Testing of Lower-Order
Note: CT: Controlling; CS: Conservation; EI: Economic Development and Infrastructure; SQ: Service (Hospitality)
TP: Ecotourism Performance; TQ: Tourism Quality; STD: Sustainable Tourism Development)

	CS	CT	EI	SQ	STD	TQ
CS						
CT	0.326					
EI	0.716	0.383				
SQ	0.458	0.642	0.445			
STD	0.564	0.647	0.560	0.587		
TQ	0.413	0.311	0.381	0.480	0.681	

2.2. Phase 2 model evaluation

In phase two, the first-order latent variables (LOC) will be standardized through the weighted average method using the latent variable index (Sarstedt et al., 2019). This process allows the second-order constructs to be standardized into first-order constructs. Based on the results in Figure 3 regarding the factor loadings, it can be observed that the values of the factors range from 0.758 to 0.920, all exceeding the threshold of > 0.7. According to Henseler et al. (2015), the outer loading factor coefficient should be > 0.7, indicating that all observed variables are significant in the model.

The results in the table show that the Cronbach's Alpha reliability coefficient ranges from 0.767 to 0.924. According to Hair et al. (2019), Cronbach's Alpha should exceed 0.7, indicating that the results meet the required standards. As for the rho_A and CR coefficients, they are both above 0.7, so it can be concluded that the reliability of the factors meets high standards based on the testing of three different reliability indices, ensuring an objective evaluation of their reliability.

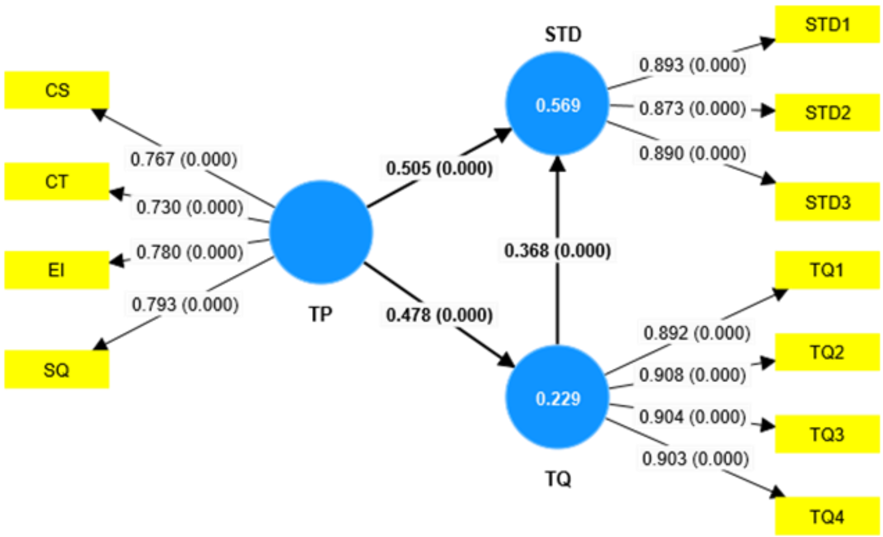

Figure 3. Results of the PLS-SEM Measurement Model for the HOC Variables Phase
(Note: TP: Ecotourism Performance; TQ: Tourism Quality; STD: Sustainable Tourism Development)

Additionally, considering convergent validity, the AVE values for the factors range from 0.589 to 0.813, which is greater than 0.5 (Hair et al., 2017), indicating that the model achieves high convergent validity.

The results in the Table 4 also show that the highest HTMT value is 0.837, which is less than 0.85, and all other HTMT coefficients are below 0.85, meeting the criteria set by Henseler et al. (2015). This demonstrates that the factors have high discriminant validity in the measurement model.

Table 4. Reliability, Discriminant Validity, and Convergent Validity Testing of the Model
(Note: TP: Ecotourism Performance; TQ: Tourism Quality; STD: Sustainable Tourism Development)

	Cronbach's Alpha	rho_A	CR	AVE	STD	TP	TQ
STD	0.862	0.863	0.916	0.784			
TP	0.767	0.768	0.852	0.589	0.837		
TQ	0.924	0.927	0.946	0.813	0.681	0.562	

Model fit testing

According to Hair et al. (2017), the VIF index is used to assess the potential occurrence of multicollinearity among the variables in the measurement model. A VIF value < 10 is acceptable, but to ensure higher reliability, a VIF value < 5 is considered good (Hair et al., 2014). Comparing the results in Table 5 for the variables in the model, it can be seen that the VIF values range from 1.000 to 1.297, all less than 4 (<4), meeting the condition of being < 5, ensuring that multicollinearity is not an issue in the model. According to Hair et al. (2019) the f^2 coefficient reflects the impact of the factors in the structural model after being standardized. Based on the results in Table 5, it shows that the values are all greater than 0.02 and even exceed 0.35, indicating that the variables have a significant effect on the dependent variable in the model. This also demonstrates that the relationships being studied are reasonable.

Table 5. Results of R^2, f^2, and Multicollinearity Tests
(Note: TP: Ecotourism Performance; TQ: Tourism Quality; STD: Sustainable Tourism Development)

	f^2	VIF	STD	TQ
TP → STD	0.457	1.297		
TP → TQ	0.297	1.000		
TQ → STD	0.242	1.297		
R^2			0.569	0.229

Additionally, the R-squared (R^2) coefficient is used to measure the explanatory power of the model for the dependent variable. This means that the variables explain 56.9% of the variance in the Sustainable Tourism Development (STD) variable, with the remaining 22.9% attributed to other variables outside the model.

2.3. Hypothesis Testing

Direct Hypothesis Testing

Based on the 95% confidence level, the P-value results for the relationships between the factors in the PLS-SEM model are all < 0.05, indicating that all relationships are statistically significant (Table 6). This suggests that the influence of the factors on each other is meaningful and relevant within the model. According to the impact coefficients, it can be concluded that Tourism Efficiency (TP) has the strongest effect on Sustainable Tourism Development (SDT) with a value of 0.505.

Table 6. Results of Direct Impact Testing
(Note: TP: Ecotourism Performance; TQ: Tourism Quality; STD: Sustainable Tourism Development)

	Coefficients	SE	T values	P values	Note
H1: TP → STD	0.505	0.028	17.897	0.000	Accepted H1
H2: TP → TQ	0.478	0.041	11.654	0.000	Accepted H2
H3: TQ → STD	0.368	0.033	11.206	0.000	Accepted H3

Mediating Role Testing

From the results of evaluating specific indirect effects and total indirect effects, it can be observed that all mediating relationships are accepted and show a direct (positive) effect, meaning hypothesis H4 is accepted (Table 7). According to Hair et al. (2021); Baron & Kenny (1986), if both indirect and direct effects are significant and in the same direction, it can be concluded that Tourism Quality plays a partial mediating role in an additive form.

Table 7. Results of Specific and Total Indirect Effects Testing
(Note: TP: Ecotourism Performance; TQ: Tourism Quality; STD: Sustainable Tourism Development)

	Coefficients	SE	T values	P values	Note
Specific Indirect Effects					
TP → TQ→ STD	0.176	0.024	7.370	0.000	Accepted H4
Total Indirect Effects					
TP → STD	0.176	0.024	7.370	0.000	Accepted H4

DISCUSSION

The PLS-SEM analysis results show that Hypothesis H1, which states that the effectiveness of ecotourism has a positive impact on sustainable tourism development, is accepted with statistical significance. The standardized regression coefficient for the relationship between ecotourism effectiveness and sustainable tourism development is 0.505, P-value = 0.000 ($p < 0.05$). This finding is quite similar to related studies globally, especially the study by Wardana et al. (2021), though the impact level in this study is lower than that indicated in the research. Ecotourism effectiveness positively influences sustainable tourism development by protecting the environment, promoting the local economy, and preserving culture. Ecotourism minimizes negative impacts on the environment and raises awareness about nature conservation. It creates job opportunities and income for local communities while encouraging the consumption of local products and services, boosting the local economy. Moreover, ecotourism helps preserve and promote traditional cultures, fostering cultural exchanges between tourists and communities. Thus, ecotourism not only enhances the quality of the experience but also contributes to the sustainable development of tourism and the local community. Additionally, infrastructure and facilities must be designed in a way that minimizes negative impacts on nature. Maintaining a protected and clean environment is a key factor for tourists. Furthermore, the study results also reveal that the relationship between the effectiveness of ecotourism and tourism quality is statistically significant, with a standardized impact coefficient of 0.478. This shows that the effectiveness of ecotourism significantly contributes to enhancing the quality of tourism, with a strong and clear impact. This coefficient indicates a positive relationship, meaning that as ecotourism effectiveness increases, tourism quality improves accordingly. Studies have demonstrated the relationship between ecotourism effectiveness and tourism quality using various research methods. A notable example is the study by Martinez (2022), where ecotourism businesses were required to provide environmentally friendly and reliable services. Additionally, Kiper’s (2013) research highlighted that ecotourism not only brings economic benefits to local communities but also helps preserve the natural environment, creating high-quality and sustainable tourism experiences. This study also affirms that tourists involved in ecotourism tend to rate tourism quality and the uniqueness of the experience higher than those in traditional tourism forms. This is consistent with the findings of Breiby et al. (2020), Khan et al. (2021), and Wardana et al. (2021).

Lastly, Hypothesis H3, stating that the quality of ecotourism positively impacts sustainable tourism development, is also accepted with a standardized impact coefficient of 0.368 and a P-value < 0.05. One of the main reasons is that ecotourism focuses on environmental protection, respecting local cultures, and promoting community economies. This finding aligns with Breiby et al. (2020) and also shows that the factors contributing to sustainable tourism quality are significant. Specifically, there are four key aspects of this experience: interaction with the natural environment, communication with the cultural environment, understanding and perspectives, and participation in activities characteristic of the destination. These factors not only add value to the tourism experience but also contribute to building a sustainable tourism system and ensuring the quality of the tourist experience. The result also confirms and validates the relationship from the studies of Ghoochani et al. (2020), Khan et al. (2021), and Wardana et al. (2021). Additionally, the research results indicate a partial mediating role of tourism quality in the relationships above. The mediating role of tourism quality between ecotourism effectiveness and sustainable tourism development is to create a tourism environment where activities are not only focused on environmental protection but also ensure meaningful experiences for tourists and contribute to the development of local communities. Tourism quality establishes a foundation for positive interactions between tourists and the local environment, encouraging respect and the protection of natural and cultural resources. This not only enhances the effectiveness of ecotourism activities but also creates sustainable development opportunities for tourism by generating income for local communities, raising awareness and commitment from tourists about environmental conservation, and fostering the inclusion and development of local cultures. Therefore, tourism quality plays a crucial role in building a sustainable tourism industry, promoting economic and social development without harming the environment and local culture.

Managerial implications

First, it is important to implement and adhere to policies that protect natural resources, alongside organizing educational programs to raise awareness about environmental protection. Second, improving service quality through staff training and the development of eco-friendly tourism products will enhance the visitor experience. Third, supporting the local economy, particularly in ecotourism areas that are preserving the region’s biospheres, can be achieved by collaborating with local businesses and creating job opportunities through tourism activities, thus contributing to local livelihoods and economic development. Finally, investing in sustainable infrastructure and establishing a strict management and control system will ensure that tourism activities comply with environmental protection regulations and standards.

These strategies will help improve the quality of ecotourism, ensuring sustainable development and bringing long-term benefits to both the community and the environment. Regarding the quality of ecotourism, first, training staff to provide professional and friendly services, as well as developing creative tourism products and services, will create unique and memorable experiences for visitors. Protecting and conserving the environment is a top priority, with specific measures such as limiting plastic use, managing waste effectively, and investing in sustainable infrastructure such as wastewater treatment systems and renewable energy. Establishing clear quality standards and conducting continuous evaluations and improvements will ensure that all activities meet the highest requirements. Lastly, organizing educational programs and using effective communication to raise awareness about the importance of protecting the environment and local culture will attract environmentally-conscious tourists. These strategies not only improve the tourism experience but also contribute to preserving natural resources and ensuring sustainable development for the local community.

To promote sustainable tourism development in the North Central region, famous tourist destinations such as Sam Son, Cua Lo, Nhat Le, Lang Co, Phong Nha – Ke Bang, Paradise Cave, Son Doong, Dong Loc Junction, the Imperial City of Hue, Thien Mu Pagoda, Ho Chi Minh's birthplace, and General Vo Nguyen Giap's tomb should be emphasized. These places are unique not only for their natural beauty but also for their historical and cultural values. It is necessary to focus on strengthening the connections and cooperation among localities in the region. First, a common tourism development plan for the entire region should be developed, focusing on leveraging the natural, cultural, and human strengths of each province. This can be achieved through organizing regular task force groups to share information, assess market conditions, and develop unique and diverse tourism products. Second, promoting and marketing tourism through joint campaigns will attract attention from major tourist distribution centers across the country.

This requires close cooperation between provinces to create a strong and attractive image of the North Central region in the tourism market. Finally, investments should be made in improving tourism infrastructure and services, while training tourism personnel to enhance service quality and the visitor experience. This will help create a sustainable and appealing tourism environment, while also increasing income and job opportunities for the local community.

Limitations and future research directions

This study, while providing valuable insights into the impact of ecotourism on sustainable tourism development in North Central Vietnam, has some limitations. The scope of the research focuses only on a few prominent tourist destinations, lacking comprehensive data from external factors such as national policies. Moreover, the long-term effects of ecotourism have not been fully assessed. Future research could expand the scope to other regions, evaluate long-term impacts, and delve deeper into policies related to the protection of natural resources. Additionally, integrating technology and innovation into ecotourism will be an important direction to promote sustainable development in the industry.

CONCLUSION

The study shows that the effectiveness of ecotourism has a significant positive impact on sustainable tourism development. This is consistent with global studies, although the level of impact is lower. The effectiveness of ecotourism benefits sustainable tourism by protecting the environment, boosting the economy in the North Central region, and preserving cultural heritage. The study also highlights the positive influence of ecotourism effectiveness on tourism quality, showing that as the effectiveness of ecotourism increases, tourism quality improves. Ecotourism quality also has a positive impact on sustainable tourism development, emphasizing the importance of environmental protection, cultural respect, and community economic promotion. The partial mediating role of ecotourism quality further highlights its importance in promoting sustainable tourism by enhancing the tourist experience and supporting local communities.

The research on the impact of ecotourism effectiveness in promoting sustainable tourism development in the North Central region reveals many positive results. Ecotourism not only raises awareness among the community and tourists about the value and necessity of environmental protection but also stimulates local economic development through job creation and income, especially for ethnic minority communities. Moreover, ecotourism supports the preservation and promotion of local cultural and traditional values, helping to maintain and promote indigenous culture.

The demand for ecotourism development encourages investment in sustainable infrastructure and services, ranging from environmentally friendly transportation to accommodations using renewable energy.

Author Contributions: Conceptualization, T.D.V. and K.P.N.K.; methodology, T.D.V. and K.P.N.K.; software, T.D.V.; validation, T.D.V. and K.P.N.K.; formal analysis, T.D.V. and K.P.N.K.; investigation, T.D.V. and K.P.N.K.; data curation, T.D.V. and K.P.N.K.; writing - original draft preparation, T.D.V. and K.P.N.K.; writing - review and editing, T.D.V. and K.P.N.K.; visualization, T.D.V. and K.P.N.K.; supervision, T.D.V. and K.P.N.K.; project administration, T.D.V. and K.P.N.K. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgements: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Angessa, A. T., Lemma, B., Yeshitela, K., & Endrias, M. (2022). Community perceptions towards the impacts of ecotourism development in the central highlands of Ethiopia: the case of Lake Wanchi and its adjacent landscapes. *Heliyon*, *8*(2), e08924. https://doi.org/10.1016/j.heliyon.2022.e08924

Breiby, M. A., Duedahl, E., Øian, H., & Ericsson, B. (2020). Exploring sustainable experiences in tourism. *Scandinavian Journal of Hospitality and Tourism*, *20*(4), 335–351. https://doi.org/10.1080/15022250.2020.1748706

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182. https://doi.org/10.1037/0022-3514.51.6.1173

Franzoni, S. (2015). Measuring the sustainability performance of the tourism sector. *Tourism Management Perspectives, 16*, 22–27. https://doi.org/10.1016/j.tmp.2015.05.007

Ghoochani, O., Ghanian, M., Khosravipour, B., & Crotts, J. C. (2020). Sustainable tourism development performance in the wetland areas: a proposed composite index. *Tourism Review*, *75*(5), 745–764. https://doi.org/10.1108/TR-02-2019-0061

Giao, H. N. K., Vuong, B. N., Phuong, N. N. D., & Dat, N. T. (2021). A model of factors affecting domestic tourist satisfaction on Eco-Tourism service quality in the Mekong Delta, Vietnam. *GeoJournal of Tourism and Geosites*, *36*(2spl), 663–671. https://doi.org/10.30892/gtg.362spl14-696

Hair J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM). *European Business Review*, *26*(2), 106–121. https://doi.org/10.1108/EBR-10-2013-0128

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis* (7th ed.). New Jersey.

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Mediation Analysis*, 139–153. https://doi.org/10.1007/978-3-030-80519-7_7

Hair, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, *1*(2), 107. https://doi.org/10.1504/IJMDA.2017.087624

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Hashemkhani Zolfani, S., Sedaghat, M., Maknoon, R., & Zavadskas, E. K. (2015). Sustainable tourism: a comprehensive literature review on frameworks and applications. *Economic Research-Ekonomska Istraživanja*, *28*(1), 1–30. https://doi.org/10.1080/1331677X.2014.995895

Helmi, M., & Naparin, M. (2023). The Influence of Ecotourism Performance on Quality Tourism and Sustainable Tourism in Swargaloka Ecotourism, Haur Gading District, North Hulu River District, South Kalimantan. *Revista de Gestão Social e Ambiental*, *17*(5), e03505. https://doi.org/10.24857/rgsa.v17n5-017

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). *The use of partial least squares path modeling in international marketing* (pp. 277–319). https://doi.org/10.1108/S1474-7979(2009)0000020014

Hoang, N. P. (2023). Các nhân tố ảnh hưởng đến phát triển du lịch sinh thái bền vững: Trường hợp nghiên cứu tại tỉnh Cà Mau [Factors Influencing the Development of Sustainable Ecotourism: A Case Study of Ca Mau Province]. *Ho Chi Minh City Open University Journal of Science – Economics and Business Administration*, *17*(4), 16–33. https://doi.org/10.46223/HCMCOUJS.econ.vi.17.4.1812.2022

Hoang, S. D., Nguyen, D. T. N., & Pham, M. (2022). Factors affecting ecotourism loyalty with the moderating role of social influence - Empirical evidence in Vietnam. *GeoJournal of Tourism and Geosites*, *43*(3), 946–954. https://doi.org/10.30892/gtg.43314-908

Huang, X., Song, J., Yang, L., Zhong, L., & Yan, K. (2023). Ecotourism certification and regional low-carbon sustainable development: A quasi-experimental study based on the Prototype-zone of National Ecotourism Attractions in China. *Journal of Cleaner Production*, *423*, 138731. https://doi.org/10.1016/j.jclepro.2023.138731

Khan, M. R., Khan, H. U. R., Lim, C. K., Tan, K. L., & Ahmed, M. F. (2021). Sustainable Tourism Policy, Destination Management and Sustainable Tourism Development: A Moderated-Mediation Model. *Sustainability*, *13*(21), 12156. https://doi.org/10.3390/su132112156

Ross, S., & Wall, G. (1999). Ecotourism: towards congruence between theory and practice. *Tourism Management*, *20*(1), 123–132. https://doi.org/10.1016/S0261-5177(98)00098-3

Sarstedt, M., Hair, J. F., Cheah, J. H., Becker, J. M., & Ringle, C. M. (2019). How to Specify, Estimate, and Validate Higher-Order Constructs in PLS-SEM. *Australasian Marketing Journal*, *27*(3), 197–211. https://doi.org/10.1016/j.ausmj.2019.05.003

TIES. (2015). *The Internatinal Ecotourism Society- TIES.*

UNWTO. (2005). Making Tourism More Sustainable - A Guide for Policy Makers. *Sustainable Development of Tourism*, 11–12.

Viera Trevisan, L., Mello, S. F., de, Pedrozo, E. Á., & Silva, T. N. da. (2022). Transformative Learning for Sustainability Practices in Management and Education for Sustainable Development: a Meta-Synthesis. *Revista de Gestão Social e Ambiental*, *16*(2), e02945. https://doi.org/10.24857/rgsa.v16n2-003

Wardana, I.M, Utama, I.W.M & Astawa, I.P. (2018). Model Of Local Population Perception In Supporting Coastal Tourism Development And Planning In Bali. *GeoJournal of Tourism and Geosites*, *23*(3), 873. https://doi.org/10.30892/gtg.23321-335

Wardana, I. M., Sukaatmadja, I. P. G., Ekawati, N. W., Yasa, N. N. K., Astawa, I. P., & Setini, M. (2021). Policy models for improving ecotourism performance to build quality tourism experience and sustainable tourism. *Management Science Letters*, 595–608. https://doi.org/10.5267/j.msl.2020.9.007

Article history: Received: 18.02.2025 Revised: 19.05.2025 Accepted: 10.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1206-1220
DOI 10.30892/gtg.602spl18-1494

HOW AI AWARENESS DRIVES EMPLOYEE INTENTION TO LEAVE IN HOTELS: THE MEDIATING ROLES OF JOB BURNOUT AND PSYCHOLOGICAL CONTRACT BREACH

Wagih M. E. SALAMA [1*], Hazem Ahmed KHAIRY [2*], Amina Ali MANSOUR [3], Wael Mohamed ALREFAE [1], Said M. AFIFY [4], Amer Tayseer Ayesh SHEHADAT [5]

[1] King Faisal University, Department of Social Studies, College of Arts, Al-Hassa, Saudi Arabia, welsayed@kfu.edu.sa (W.M.E.S.)
[2] University of Sadat City, Hotel Management Department, Faculty of Tourism and Hotels, Sadat City, Egypt, hazem.khaiery@fth.usc.edu.eg (H.A.K.)
[3] Physician Egyptian Ministry of Health, Egypt, Cairo, Egypt, aminaelmansory111@gmail.com (A.A.M.)
[4] King Faisal University, Department of Geography, Al-Hassa, Saudi Arabia, safify@kfu.edu.sa, Saudi Arabia (S.M.A.)
[5] Mansoura University, Hotel Management, Mansoura, Egypt, amershhadat@gmail.com (A.T.A.)

Citation: Salama, W.M.E., Khairy, H.A., Mansour, A.A., Alrefae, W.M., Afify, S.M., & Shehadat, A.T.A. (2025). How AI awareness drives employee intention to leave in hotels: The mediating roles of job burnout and psychological contract breach. *Geojournal of Tourism and Geosites*, 60(2spl), 1206–1220. https://doi.org/10.30892/gtg.602spl18-1494

Abstract: The main aim of this research is to examine the impact of AI awareness on the intention of employees in five-star hotels in Egypt to leave their jobs, with a focus on understanding the mediating roles of job burnout and psychological contract breach in this relationship. To evaluate the proposed model, 303 responses from full-time employees in five-star hotels were analyzed using the PLS-SEM approach. The results indicate that AI Awareness significantly contributes to increased employee intention to leave, job burnout, and perceived psychological contract breach. Additionally, both job burnout and perceived psychological contract breach have a positive effect on employees' intention to leave. The study further highlights the mediating role of AI awareness in influencing intention to leave through job burnout and perceived psychological contract breach. This study makes significant theoretical contributions by revealing how AI awareness influences employee turnover through psychological and emotional mechanisms, rather than direct causality. It extends existing theories by showing that AI awareness triggers burnout and perceptions of psychological contract breach, which in turn affect turnover intentions. This insight enriches our understanding of how technological change impacts employee attitudes, especially in technology-sensitive sectors like hospitality. The study also broadens job burnout theory by introducing AI-induced stressors such as job displacement fears and lack of control. Additionally, it advances psychological contract theory by illustrating how AI alters employees' perceptions of job security, fairness, and career progression. These shifts can undermine trust and commitment, highlighting the need for clear communication during AI implementation. From an HRM perspective, the findings stress the importance of evolving practices to address both technical and emotional employee needs. Practically, hotel managers should communicate transparently about AI's role to reduce insecurity and encourage buy-in. Offering AI-focused skill development can ease fears of redundancy and boost job satisfaction. Burnout should be managed through wellness programs, mental health support, and promoting work-life balance. Involving employees in AI decisions enhances their sense of control and fairness. Trust-building and ethical transparency are vital for maintaining psychological safety. Providing career development paths within an AI-enhanced environment reinforces employees' long-term organizational value. Finally, a supportive, fair workplace fosters engagement and reduces turnover intentions in an AI-driven future.

Keywords: AI Awareness, employee intention to leave, job burnout, psychological contract breach, Hotel Enterprises

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INTRODUCTION

The impact of artificial intelligence (AI) on the modern workforce is a pressing concern for organizations worldwide (Brynjolfsson & McAfee, 2023). As AI assumes more responsibilities and automates tasks, employees are left to navigate the consequences of these changes (Autor et al., 2022). One potential outcome is a decline in job satisfaction and engagement, which can ultimately lead to turnover intention (Achmad et al., 2023). Research indicates that employees who perceive AI as a threat to their jobs or feel that their skills are being devalued are more likely to experience job burnout and a breach of psychology (Yu et al., 2022). Job burnout, a state of emotional, mental, and physical exhaustion, has been linked to decreased job satisfaction, decreased performance, and increased turnover intention (Maslach & Jackson, 1981). When employees feel overwhelmed by the demands of their job and lack the resources to cope, they are more likely to experience burnout (Maslach & Leiter, 2016). In the context of AI, employees who feel that their jobs are being threatened or that they are being replaced by machines may experience increased levels of burnout (Yon, 2024).

Psychological contract breach occurs when employees feel that their employer has not met their expectations or has failed to provide a sense of security and fairness (Rousseau, 1995). When employees feel that their employer is not

* Corresponding author

investing in their development or is not providing a fair return on their investment of time and effort, they are more likely to experience a breach of psychological contract *(*Conway & Briner, 2005*)*. In the AI context, employees may feel that their employer is not providing them with the necessary training and support to adapt to changing technologies, leading to a breach of psychological contract (Yon, 2024). A study by Suseno et al. (2022) found that employees who perceived AI as a threat to their jobs experienced higher levels of job burnout and turnover intention. Similarly, a study by Zhao et al. (2007) revealed that employees who felt their employer had breached their psychological contract were more likely to experience job dissatisfaction and turnover intention. These findings suggest that job burnout and psychological contract breach may play important mediating roles in the relationship between employee awareness of AI and their turnover intention.

There are many gaps in this study, which are represented by: - there is a lack of studies examining how employees' awareness of AI influences their intention to leave. - Most existing studies on employee turnover focus on organizational and economic factors, with less attention given to psychological aspects such as job burnout and psychological contract breach. - Although job burnout and psychological contract breach are known to affect employee retention, their role in mediating the relationship between AI awareness and turnover intentions remains underexplored. - Although job burnout and psychological contract violation are known to impact employee retention (Bai et al., 2024), their role in mediating the relationship between AI awareness and turnover intentions remains unexplored. This research aims to fill the knowledge gap regarding the influence of AI awareness on employees' intention to leave.

This research examines the influence of job burnout and psychological contract violation on employees' intention to leave (Ivana, 2025). There are several objectives of this study: first, to examine the influence of AI awareness on employees' intention to leave; investigate the mediating role of job burnout in the relationship between AI awareness and employees' intention to leave (Boscardin et al., 2024); analyze the mediating effect of psychological contract violation on the relationship between AI awareness and employees' intention to leave (Abbas & Al Hasnawi, 2020); and explore the joint mediating effects of job burnout and psychological contract violation on the relationship between AI awareness and employees' intention to leave (Teng et al., 2023). The research also calls for a valuable theoretical framework. We created the four research inquiries as narrated below:

RQ1: What influence does AI awareness have on an employee's intention to leave?

RQ2: How does job burnout impact employee's intention to leave?

RQ3: How does psychological contract breach impact an employee's intention to leave?

RQ4: How does job burnout and psychological contract breach intermediate amid AI awareness and employee's intention to leave?

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

AI awareness

AI awareness refers to the understanding of artificial intelligence, including its capabilities, limitations, and impact on various aspects of life and work (Brynjolfsson & McAfee, 2023). In today's fast-evolving technological landscape, developing AI awareness is essential for both individuals and organizations (Aldoseri et al., 2024). It enables people to adapt to AI-driven transformations, make informed decisions, and effectively utilize AI tools to enhance productivity and innovation (Brundage, 2018). For employees, AI awareness helps reduce uncertainty and anxiety about job roles, fostering confidence and job satisfaction (Nomura et al., 2020). On a larger scale, it encourages the ethical and responsible use of AI, addressing concerns such as bias, privacy, and transparency (Mittelstadt et al., 2016). By promoting AI awareness through education, training, and open communication, society can maximize AI's benefits while mitigating its challenges, ensuring that technology serves as a force for progress and inclusivity (Jobin et al., 2019).

The Benefits of AI Awareness are far-reaching, impacting individuals, organizations, and society (Floridi et al., 2018). For employees, AI awareness fosters confidence and adaptability, enabling them to understand how AI tools can enhance their work and reduce manual effort. This leads to increased job satisfaction, reduced anxiety about job displacement, and improved productivity (Dignum, 2019). Organizations benefit from AI awareness through better decision-making, as employees can interpret AI-driven insights and contribute to strategic goals (Taddeo & Floridi, 2018). Additionally, AI awareness promotes collaboration by creating a shared understanding of how AI can streamline workflows and improve communication (Rahwan, 2018). On a societal level, it encourages ethical and responsible AI use, addressing concerns such as bias, privacy, and transparency. By fostering AI awareness, we can unlock the full potential of AI technologies while ensuring they are used in ways that benefit everyone, driving innovation and inclusiveness in the digital age (Buolamwini & Gebru, 2018).

While AI awareness is essential for harnessing the benefits of artificial intelligence, several challenges hinder its widespread adoption and understanding. Many individuals lack basic knowledge about AI, including its operation, limitations, and real-world applications (Ananny & Crawford, 2018). This gap in understanding can lead to skepticism, fear, or over-reliance on AI systems (Shneiderman, 2020). AI systems can perpetuate biases in training data, leading to unfair outcomes (e.g., in hiring or law enforcement) (Dignum, 2019). Raising awareness of these ethical dilemmas is challenging, because it requires explaining complex technical issues to non-experts (Rahwan, 2018).

The rapid evolution of AI makes it difficult for awareness initiatives to keep up. By the time educational materials are developed, newer technologies or ethical debates may emerge (Brundage, 2018). Many AI algorithms (e.g., deep learning models) operate as "black boxes," making it difficult to explain their decision-making processes. This lack of transparency undermines trust and complicates awareness efforts (Floridi et al., 2018).

Marginalized communities, the elderly, or those living in developing regions often lack access to AI education and tools, exacerbating disparities in AI awareness and adoption (Mittelstadt et al., 2016). Governments and institutions struggle to create frameworks that balance innovation with accountability. In the absence of clear guidelines, public awareness campaigns may lack direction (Taddeo & Floridi, 2018).

Employee's intention to leave

Employee intention to leave describes an employee's contemplation or decision to voluntarily depart from their current position, driven by factors such as dissatisfaction with their role, limited advancement opportunities, insufficient compensation, ineffective leadership, or an unsupportive workplace culture (Ajzen, 1991). These intentions, if unaddressed, can have significant repercussions for organizations, including rising recruitment expenses, the erosion of institutional expertise, and reduced operational efficiency (Tett & Meyer, 1998). To counter this, employers should prioritize cultivating an inclusive and motivating work environment, investing in professional development programs, offering equitable remuneration, and strengthening managerial support (Griffeth et al., 2000). Proactively identifying and addressing the root causes of turnover intentions enables organizations to boost employee satisfaction, strengthen engagement, and improve long-term retention, ensuring a stable and committed workforce (Bakker & Demerouti, 2017; Baquero et al., 2025). Employees' intention to leave an organization is increasingly influenced by their perceptions of AI integration in the workplace (Zhao et al., 2007). When employees lack awareness of how AI will reshape their roles, they may experience heightened job insecurity, anxiety about being replaced, or frustration with inadequate training to adapt to new technologies (Hom et al., 2017). Studies suggest that poor communication about AI's purpose and benefits can erode trust in leadership, exacerbating turnover intentions (Allen et al., 2010).

For instance, employees in repetitive or routine roles may fear automation-driven layoffs, while others may feel overwhelmed by the pace of technological change (Zhao et al., 2007). Conversely, organizations that prioritize AI awareness initiatives such as transparent communication, upskilling programs, and involving employees in AI implementation—can mitigate these concerns (Hom et al., 2017). By fostering a culture of inclusion and empowerment, employers can reduce turnover risks and align workforce expectations with AI-driven transformations, ultimately retaining talent that feels valued and prepared for the future (Bakker & Demerouti, 2017; Khairy et al., 2025).

Job burnout

Job burnout is a state of chronic physical, emotional, and mental exhaustion caused by prolonged work-related stress (Maslach & Jackson, 1981). It often occurs when employees experience excessive workloads, lack of control over their tasks, unclear job expectations, or an imbalance between effort and recognition (Yon, 2024). Burnout can manifest through persistent fatigue, reduced motivation, cynicism toward work, and a decline in job performance (Bakker & Demerouti, 2007). Over time, it may contribute to serious health issues, including anxiety, depression, and cardiovascular problems, further impacting both personal well-being and workplace productivity (West, 2016).

The consequences of job burnout extend beyond individual employees, affecting organizations through increased absenteeism, high turnover rates, and lower overall efficiency (Meier & Kim, 2022).

Burnout can lead to disengagement, a lack of creativity, and strained workplace relationships, ultimately diminishing an organization's ability to achieve its goals. If left unaddressed, burnout can create a toxic work culture where stress and dissatisfaction become the norm (Ryan ,2023). To prevent and manage job burnout, organizations should promote a healthy work-life balance, encourage open communication, provide mental health resources, and ensure employees have reasonable workloads (Salama et al., 2022). Offering career development opportunities, fostering a supportive leadership style, and recognizing employees' efforts can also help mitigate burnout (Jasim et al., 2024; Yon, 2024; Salama et al., 2025). By prioritizing employee well-being and creating a positive work environment, businesses can enhance job satisfaction, productivity, and long-term retention (Meier & Kim, 2022).

A psychological contract breach

A psychological contract breach occurs when employees perceive that their employer has failed to meet expectations regarding work conditions, job security, career advancement, or other informal agreements that shape the employee-employer relationship (Gong & Sims, 2022). Unlike formal contracts, the psychological contract is based on mutual trust and perceived obligations, often formed through verbal promises, workplace culture, or past experiences (Bal & de Lange, 2022). When these expectations are unmet—whether through broken promises, sudden policy changes, or lack of recognition—employees may feel betrayed, leading to emotional distress, decreased job satisfaction, and diminished commitment to the organization (Alia, 2020). The consequences of a psychological contract breach can be severe, including increased workplace stress, reduced engagement, withdrawal behaviors, and even higher turnover rates. Employees who experience a breach may exhibit lower performance, resistance to organizational change, and reluctance to contribute beyond their basic job responsibilities. Over time, unresolved breaches can erode workplace morale and trust, negatively impacting team dynamics and overall organizational performance (Baber et al., 2022).

To prevent and mitigate psychological contract breaches, organizations must prioritize transparency, effective communication, and fair treatment (Topa et al., 2022). Leaders should ensure that expectations are clearly defined, provide regular feedback, and involve employees in decision-making processes (Ahmed et al., 2013). When changes occur, timely and honest communication can help manage employee perceptions and reduce negative reactions. Additionally, fostering a supportive workplace culture where employees feel valued and heard can strengthen the psychological contract, enhancing loyalty, motivation, and long-term retention (Cassar & Briner, 2011).

Psychological Contract Theory (PCT)

Psychological Contract Theory (PCT) explains the implicit and explicit expectations between employees and employers, shaping workplace relationships beyond formal contracts. Originally introduced by Argyris (1960) and later developed by Rousseau (1989), PCT emphasizes that employees form psychological contracts based on perceived promises regarding job security, career development, fair treatment, and organizational support. These contracts influence employee attitudes, motivation, and behaviors, acting as an essential component of organizational commitment and retention (Rousseau, 1995). Unlike formal employment agreements, psychological contracts are subjective and evolve based on experiences, communication, and workplace dynamics (Conway & Briner, 2011).

When organizations fail to meet these expectations—known as psychological contract breach (PCB)—employees often experience disappointment, reduced trust, and a decline in job satisfaction (García-Madurga,2024). Research indicates that PCB can lead to negative outcomes such as increased turnover intentions, lower engagement, and counterproductive work behaviors (Singh & Dhan, 2023). However, organizations that actively manage psychological contracts through transparent communication, supportive leadership, and fair HR practices can enhance employee loyalty and performance (Selenko et al., 2022). PCT remains a valuable framework for understanding workplace relationships, particularly in dynamic environments influenced by technological changes and evolving employee expectations.

AI awareness and employees' intention to leave

The adoption of AI in workplaces has reshaped employee perceptions of job security, role clarity, and career trajectories (Xu et al., 2023). Research highlights a nuanced relationship between AI awareness (employees' understanding of AI's capabilities, limitations, and ethical implications) and intention to leave (turnover intention) (Xu et al., 2023). Employees with limited AI awareness often perceive automation as a direct threat to their roles, leading to anxiety and increased turnover intentions. A study by McKinsey Global Institute (2023) found that workers in repetitive or routine jobs are more likely to fear job loss due to AI, particularly when organizations fail to communicate how AI will augment (rather than replace) human tasks. However, AI literacy programs can mitigate this fear by clarifying AI's role as a collaborative tool (Brynjolfsson, 2022). A lack of transparency in AI decision-making (e.g., "black box" algorithms) can erode trust in leadership, driving turnover intentions. Pavuluri et al. (2024) emphasizes that employees are more likely to stay in organizations that openly address AI ethics, including bias mitigation and accountability. Conversely, opaque AI policies correlate with disengagement (Nazareno & Schiff, 2021).

Poorly integrated AI systems can inadvertently increase workload (Xu et al., 2023). Employees unaware of AI's long-term benefits may perceive these changes as stressors, accelerating burnout and turnover intentions. Kim & Lee (2024) found that 45% of workers in tech-driven industries reported burnout linked to rapid AI adoption. Employees with high AI awareness often scrutinize ethical issues like algorithmic bias or privacy violations. Jobin et al. (2019) found that morally conscious employees may disengage or leave organizations that ignore ethical AI practices. Proactive ethical guidelines, however, align employee values with organizational goals, reducing turnover (Nazareno& Schiff, 2021). Aligns with Psychological Contract Theory (PCT), as employees who become more aware of AI's impact on the workplace may perceive a threat to job stability, violating their expectations of long-term employment and career progression (Selenko et al., 2022). Based on this, the following hypothesis is proposed:

H1: AI awareness increases employees' intention to leave

AI Awareness and Job Burnout

The relationship between AI awareness and job burnout is complex and context dependent (Teng et al., 2024). While AI awareness can empower employees, it may also contribute to burnout under certain conditions, particularly when combined with poor organizational practices, rapid technological change, or ethical concerns (Mahapatra & Pati, 2018). Employees who are aware of the capabilities and limitations of AI may face increased stress due to Uncertainty about how AI will reshape their responsibilities, Pressure to continually upskill to stay relevant in an AI-driven workplace, Awareness of AI-powered monitoring tools that intensify feelings of constant evaluation (Wang et al., 2023).

Parker & Grote (2022) found that employees in AI-augmented roles reported higher stress levels when they perceived AI as a threat to their autonomy or job security. The relationship between AI awareness and job burnout is a complex issue that has received significant attention in recent year (Kong et al., 2021).

Shneiderman (2022) found that 58% of employees in technology-intensive industries, such as logistics and education, experience "decision fatigue" due to constant interaction with AI systems that prioritize efficiency over human-centered workflows. This relentless pace, combined with the pressure to compete with AI accuracy, has been shown to erode self-efficacy, a major barrier to burnout.

Meier & Kim (2022) found that employees in hybrid AI-human teams often experience role ambiguity, with blurred boundaries between their responsibilities and AI functions contributing to chronic stress. For example, customer service workers using AI chatbots face conflicting demands to personalize interactions while adhering to strict AI-generated scripts, exacerbating emotional labor. Ryan(2023) refers that, to mitigate these trends, organizations are urged to adopt AI designs that put humans at the center and prioritize transparency, equitable task distribution, and mental health support. For example, companies like IBM and Microsoft are now incorporating AI ethics and mindfulness training programs into their employee development initiatives. These programs aim to educate employees on the benefits and limitations of AI, while promoting emotional intelligence, resilience, and well-being (Yon, 2024). This is consistent with

Psychological Contract Theory (PCT), as AI-driven changes may increase job demands, reduce autonomy, or create uncertainty, contributing to stress and burnout (Singh &Dhan, 2023). Based on this, the following hypothesis is proposed:

H2: AI Awareness Increases Job Burnout

Job burnout and employees' intention to leave

Job burnout significantly amplifies employees' intention to leave their organizations (Maslach & Leiter, 2016). Schaufeli & Bakker (2004) found that employees experiencing chronic burnout are 2.4 times more likely to actively seek new work, driven by emotional exhaustion and low job satisfaction. This is consistent with Linzer et al. (2023) who identified burnout, particularly feelings of cynicism and detachment, as a critical predictor of turnover intentions across industries, including healthcare and technology. The COVID-19 pandemic has further exacerbated this dynamic, with Linzer et al. (2023) indicating that burnout accounted for 34% of the variance in turnover intentions among frontline workers, with inadequate support systems for resignations intensifying. Furthermore, Mat-Rifin & Danaee (2022) highlighted that the impact of burnout on turnover is mediated by perceived organizational injustice, such as unequal workload distribution driven by AI. To mitigate burnout, experts urge employers to prioritize mental health interventions, flexible work policies, and equitable resource allocation, as recommended by the 2022 WHO Guidance on Well-Being in the Workplace (Kwon, 2022). Job burnout is increasingly recognized as a critical driver of employee turnover, with recent studies highlighting its multifaceted impact across industries (Salvagioni et al., 2017).

Poku et al, (2025) found that burned-out employees are 3.2 times more likely to leave their jobs within six months than their peers, citing emotional exhaustion and a perceived lack of empathy in the workplace as key drivers. In the tech sector, employees in AI-driven roles reported 50% higher turnover intentions due to "algorithmic fatigue," where constant performance monitoring and AI-driven decision-making erodes trust. The role of burnout in employee turnover is mediated by organizational disconnection, as Güveyi (2025) show that workplace culture predicting turnover even among high performers. Poku et al. (2025) found that turnover due to burnout disproportionately affects women and marginalized groups, who often face compounding stressors like unpaid emotional labor and biased AI tools. This reflects the Psychological Contract Theory (PCT) assertion that when employees feel overwhelmed and unsupported, their psychological contract weakens, making them more likely to seek alternative employment (Jiang & Lavaysse, 2018). Based on this, the following hypothesis is proposed:

H3: Job burnout increases employees' intention to leave

Job burnout as a mediator

Job burnout acts as a crucial mediator in the relationship between AI awareness and employee intention to leave (Xu et al., 2023). Employees exposed to AI experienced increased emotional exhaustion and cynicism, which increased their intention to leave by 33%) Kim & Lee, 2024) . In line with Teng et a.l (2024), an analysis of the performance of technology workers showed that AI-related stressors such as pressures to constantly upskill and fears of algorithmic replacement exacerbated burnout, explaining 48% of the variance in employees' plans to quit(Kong et al., 2021). Pavuluri et al., (2024) reported that physicians using AI diagnostic tools reported 40% higher burnout rates due to "automation guilt" which was directly associated with lower job commitment and higher turnover rates (Linzer et al., 2023). These findings underscore the role of burnout as a bridge between AI integration and workforce attrition. The mediating effect of burnout is exacerbated by organizational factors such as inadequate support systems and opaque governance of AI (Bail, 2023). Burnout mediated 55% of the relationship between AI awareness and turnover intentions among remote workers, especially when AI tools prioritized productivity over well-being (Mat Rifin & Danaee, 2022). Moderating factors such as transparent leadership can mitigate this: for example, organizations that implement "explainable AI" frameworks and retraining programs have reduced burnout-related attrition (Kong et al., 2021). Collectively, these insights underscore the urgent need to address burnout as a central pathway through which AI awareness fuels turnover (Salvagioni et al., 2017). This supports Psychological Contract Theory (PCT) by emphasizing that AI-related stressors may first cause burnout, which then leads to higher turnover intentions (Zaza et al., 2022). Based on this, the following hypothesis is proposed:

H4: Job burnout mediates the relationship between AI awareness and employees' intention to leave

AI awareness and psychological contract breach perception

Growing evidence suggests that awareness of AI increases employee perceptions of psychological contract breach (PCB), particularly around unmet expectations around job security, career development, and fair treatment (Gong & Sims, 2022). Yon (2024) found that employees in AI-intensive industries felt a stronger psychological contract breach when they believed AI was reliant on cost-cutting at the expense of human well-being, eroding trust in organizational promises. (Yu et al.,2022) noted that 64% of workers surveyed felt that AI-led restructuring violated implicit "career growth" commitments, as roles were automated without retraining opportunities, leading to disillusionment.

This is consistent with Kiron et al., (2023) who linked AI-induced job uncertainty to a 32% increase in PCB scores, driven by concerns about skill obsolescence and opaque decision-making algorithms. The perceived mismatch between organizational AI strategies and employee expectations creates a "trust gap," where workers interpret AI adoption as a breach of relational contracts built on loyalty and mutual support.The psychological contract breach is exacerbated by AI's role in reshaping workplace transparency and procedural justice (Baber et al., 2022; Agina et al., 2025). Achmad et al., 2023 found that employees who underwent AI-driven performance evaluations reported 41% higher perceptions of PCB than their peers in traditional systems, citing concerns about biased metrics and lack of human oversight ((Kim &

Lee, 2024) .This dynamic is amplified in hybrid work environments, where Gong & Sims (2022) found that remote employees using AI collaboration tools felt "abandoned" by employers who failed to address AI-induced inequities, such as unequal access to training or biased task allocation. Additionally, (Yu et al., 2022) found that organizations deploying AI without shared decision-making saw perceptions of PCB increase by 28%, with employees interpreting top-down AI integration as a unilateral infringement on their voice in workplace changes. To mitigate these risks, scholars emphasize the need for "co-designed AI," where implementation is shaped by employee input, restoring alignment between organizational procedures and psychological contract expectations (McKinsey Global Institute, 2023).

Psychological contract breach (PCB) significantly amplifies employees' intention to leave (Brynjolfsson, 2022). PCB was responsible for 29% of the variance in turnover intentions across industries, with the strongest effects observed in sectors such as healthcare and technology, where unmet expectations around work-life balance and career development are prevalent (Xu et al., 2023). Employees who felt that their "relational" contracts were violated were more likely to actively seek new jobs than those who felt that their psychological contracts were being upheld (Aldoseri et al., 2024). This is consistent with Gong & Sims (2022) who reported in 2024 that 58% of employees experiencing trust erosion and emotional detachment reported that trust erosion and emotional detachment were the main drivers of their departure plans, particularly in organizations undergoing rapid technological change. These findings confirm that trust erosion is a critical precursor to attrition, mediated by feelings of betrayal and decreased organizational commitment (Gong & Sims, 2022).

Directly aligns with Psychological Contract Theory (PCT), as employees who recognize AI's impact on job roles may perceive a breach in their psychological contract, feeling that their employer has failed to uphold implicit promises (Braganza et al., 2021). Based on this, the following hypothesis is proposed:

H5: AI awareness increases psychological contract breach perception

Psychological contract breach and employees' intention to leave

The relationship between PCB and turnover intentions is strengthened by organizational justice and leadership transparency (Abdalla, 2021). Employees who experienced procedural injustice combination with PCB were 3.1 times more likely to leave within a year, compared to those who experienced PCB alone (Zhao et al., 2018). Organizations that proactively address PCB through restorative practices such as transparent communication about AI integration and participatory decision-making reduce the risk of attrition (Topa et al., 2022). These findings highlight the urgent need to align organizational procedures with employee expectations to mitigate PCB-induced attrition (Topa et al., 2022).

Moreover, the negative effects of PCB on turnover intention are particularly strong in environments where employees feel undervalued or unsupported (Zhao et al., 2018). Studies show that breaches related to career development and job security have the most profound impact on employees' decision to leave, as they directly affect long-term professional stability (Kaya & Karatepe, 2020). Employees who perceive a psychological contract breach often experience lower job satisfaction and higher burnout, further accelerating their desire to seek new opportunities (Xie et al., 2020). Organizations that fail to address PCB risk higher turnover rates, whereas those that actively rebuild trust - through transparent communication, fair policies, and supportive leadership - can mitigate these adverse effects (Zaza et al., 2022). It is a fundamental principle of Psychological Contract Theory (PCT), as failure to meet expectations often leads to employee dissatisfaction and turnover (Xu et al., 2023). Based on this, the following hypothesis is proposed:

H6: Psychological contract breach increases employees' intention to leave.

Psychological contract breach as a mediator

Psychological contract breach plays a crucial role in shaping employee responses to workplace changes, particularly in the context of AI awareness (Li et al., 2019). AI-driven transformations often create uncertainty regarding job security, career advancement, and fairness in decision-making, which can lead to perceptions of a breach in the psychological contract between employees and their organizations (Teng et al., 2023). When employees perceive that their implicit expectations such as job stability, growth opportunities, and fair treatment have been violated due to AI implementation, their trust in the organization diminishes, increasing their intention to leave (Zhao et al., 2018). This is consistent with the social exchange theory, which suggests that employees reciprocate perceived organizational support with loyalty but react to breaches with withdrawal behaviors (Gong & Sims, 2022).

Furthermore, AI awareness can amplify the effects of PCB by shaping employees' expectations and concerns about technological disruption (Abdalla, 2021). Employees with higher AI awareness may anticipate potential risks, such as job displacement or skill redundancy, leading to increased sensitivity to breaches of their psychological contract (Brynjolfsson, 2022). This accelerates perceived turnover intentions as employees seek more stable and flexible AI work environments (Jiang & Lavaysse, 2018). Recent research suggests that organizations that mitigate PCB through transparent communication, retraining initiatives, and ethical AI integration can reduce the negative impact on employee retention (Gong & Sims, 2022). Therefore, PCB serves as a critical mediator linking AI awareness to employee turnover intentions, underscoring the need for proactive HR strategies to maintain workforce engagement in AI-driven workplaces (Yu et al., 2022). Psychological Contract Theory (PCT) extends the scope by suggesting that AI-related concerns (e.g., job insecurity, skills shortages) may first motivate PCB, which then leads to higher turnover intentions (Jiang & Lavaysse, 2018). Based on this, the following hypothesis is proposed:

H7: Psychological contract breach mediates the relationship between AI awareness and employees' intention to leave.

The theoretical framework of the study is illustrated below in Figure 1.

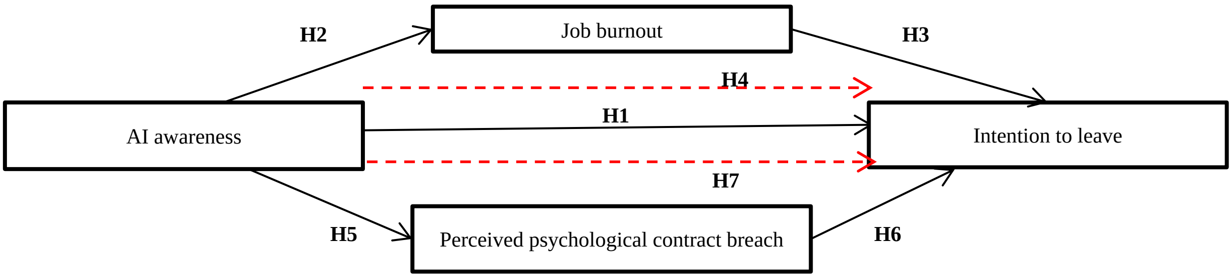

Figure 1. the theoretical framework of the study

RESEARCH METHODOLOGY

Measures and instrument development

A quantitative approach was adopted to collect data. A structured survey was conducted to investigate the impact of AI awareness on employees' intention to leave, with a focus on the mediating roles of job burnout and psychological contract breach. All variables were measured using established scales adapted from prior research, and responses were assessed on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). AI awareness was assessed using a four-item scale adapted from Brougham and Haar (2018). Employees' intention to leave was evaluated with a three-item scale developed by Babakus et al. (2008). Job burnout was measured using an eight-item scale adapted from Maslach et al. (1997) and Irfan et al. (2023). Perceived psychological contract breach was assessed with a five-item scale adapted from Robinson and Wolfe Morrison (2000). A complete list of the scale items can be found in Appendix A.

The study employed a self-administered questionnaire. The original English version was translated into Arabic by a bilingual expert and subsequently back-translated into English by a second bilingual professional to ensure accuracy. A comparison of the original and back-translated versions confirmed their consistency. As a result, the Arabic version of the questionnaire was used with participants to improve clarity and increase response rates.

Sampling and Data Collection

The study model was assessed using data from full-time employees at five-star hotels in Egypt, chosen for their significant influence on the country’s hospitality sector. These hotels provide an ideal setting for exploring the impact of AI on employee well-being and turnover intentions due to their high-tech, high-pressure environments where employees frequently interact with advanced AI systems. The demanding nature of the industry often leads to job stress and burnout, making it crucial to investigate how AI affects employees' perceptions of their roles and their psychological contract. Additionally, the luxury hospitality sector experiences high employee turnover, often driven by dissatisfaction and burnout, further underscoring the importance of understanding AI’s influence. The combination of cutting-edge technology and intense work culture in five-star hotels makes them a particularly relevant context for this research. Participants were required to have at least one year of experience, ensuring they had sufficient exposure to the work environment to provide valuable insights. As Morrison (1993) notes, employees typically gain a solid understanding of an organization’s culture within six months, making the one-year experience requirement suitable for the study. Data were collected from employees at 23 five-star hotels in Greater Cairo, a region identified by the Egyptian Ministry of Tourism and Antiquities as having 30 five-star hotels. A judgmental sampling approach was used to select the hotels, while a convenience sampling method was applied to gather responses from employees who volunteered. The survey was administered after obtaining verbal consent from hotel management, with participation remaining voluntary and anonymous to ensure confidentiality. A total of 303 valid responses were collected, surpassing the recommended minimum sample size of 200 respondents (Hair et al., 2010), based on a 1:10 ratio of variables to respondents. This sample size was deemed sufficient for the analysis.

RESULTS

Participant’s profile

Table 1 outlines the demographic profile of the study participants, which consists of 303 individuals. The majority are male (80.86%), with females making up 19.14%. In terms of age, 46.86% are between 18-35 years, 31.35% are 36-45 years, and 21.78% are over 45 years. Regarding education, most participants have a Bachelor’s degree (67.66%), followed by high school graduates (24.42%) and those with a Master’s or PhD (7.92%).

Table 1. Participant’s profile (N=303)

		Frequency	Percent
Gender	Male	245	80.86
	Female	58	19.14
Age	18-35	142	46.86
	36-45	95	31.35
	Over 45	66	21.78
	High schools	74	24.42
Education	Bachelor	205	67.66
	Master/PhD	24	7.92
	Male	245	80.86

Measurement model

Kock's (2021) ten model fit indices were used to analyze a four-factor model involving AI awareness (AIA), Intention to leave (ITL), Job burnout (JB), and Perceived psychological contract breach (PPCB). Appendix (B) presents the model fit and quality indices for the study. Each measure is assessed against specific criteria to determine if the model fits well. Overall, all the model fit indices are within the acceptable or ideal ranges, suggesting that the model is well-fitting and of high quality. Table (2) presents the details of the constructs, including item loadings, Cronbach's alpha, Composite Reliability (CR), Average Variance Extracted (AVE), and Variance Inflation Factors (VIFs). For AI awareness (AIA), the construct shows strong reliability and validity. The Cronbach's alpha is 0.825, indicating good internal consistency.

The CR value is 0.884, and the AVE is 0.657, both of which are above the acceptable thresholds of 0.7 for CR and 0.5 for AVE, suggesting good construct validity. The VIF value of 2.684 is also within the acceptable range, indicating no significant issues with multicollinearity. The intention to leave (ITL) construct has a Cronbach's alpha of 0.852, a CR of 0.910, and an AVE of 0.772. These values show excellent internal consistency and construct reliability. The VIF of 1.693 is also low, suggesting no multicollinearity concerns. For job burnout (JB), the Cronbach's alpha is 0.898, and the CR is 0.918, both indicating high reliability. The AVE is 0.583, which is just above the threshold of 0.5, making it acceptable. The VIF of 2.845 is within an acceptable range, indicating no major multicollinearity issues. The perceived psychological contract breach (PPCB) construct has a Cronbach's alpha of 0.894 and a CR of 0.851, both indicating good reliability. The AVE is 0.628, suggesting adequate construct validity, and the VIF of 2.990 is also acceptable. Overall, all constructs in the table show good reliability, validity, and minimal multicollinearity, making them suitable for analysis.

Table 2. Item loadings, Cronbach alpha, CR, AVE, and VIFs

Constructs	Item loading	Cronbach alpha	CR	AVE	VIFs
AI awareness (AIA)	-	0.825	0.884	0.657	2.684
Item.1	0.793				
Item.2	0.840				
Item.3	0.839				
Item.4	0.768				
Intention to leave (ITL)	-	0.852	0.910	0.772	1.693
Item.1	0.865				
Item.2	0.895				
Item.3	0.876				
Job burnout (JB)	-	0.898	0.918	0.583	2.845
Item.1	0.769				
Item.2	0.803				
Item.3	0.737				
Item.4	0.796				
Item.5	0.747				
Item.6	0.728				
Item.7	0.803				
Item.8	0.722				
Perceived psychological contract breach (PPCB)	-	0.894	0.851	0.628	2.990
Item.1	0.725				
Item.2	0.775				
Item.3	0.834				
Item.4	0.843				
Item.5	0.779				

Table 3. Discriminant validity results using the Fornell-Larcker Criterion

	AIA	ITL	JB	PPCB
AI awareness (AIA)	0.811	0.540	0.698	0.760
Intention to leave (ITL)	0.540	0.879	0.623	0.516
Job burnout (JB)	0.698	0.623	0.764	0.743
Perceived psychological contract breach (PPCB)	0.760	0.516	0.743	0.793
"Off-diagonal elements are correlations and diagonal elements are square roots of AVE"				

Table (3) presents the results of discriminant validity using the Fornell-Larcker Criterion, which compares the square roots of the Average Variance Extracted (AVE) for each construct against the correlations between constructs. In the table, the diagonal elements represent the square roots of the AVE for each construct, while the off-diagonal elements show the correlations between the constructs. For AI Awareness (AIA), the square root of the AVE is 0.811, indicating good discriminant validity. The correlations between AIA and the other constructs (Intention to Leave, Job Burnout, and Perceived Psychological Contract Breach) are 0.540, 0.698, and 0.760, respectively. All these values are lower than the square root of AIA's AVE, suggesting that AIA is distinct from the other constructs. For Intention to Leave (ITL), the square root of the AVE is 0.879. The correlations between ITL and the other constructs are 0.540 (AIA), 0.623 (Job Burnout), and 0.516 (PPCB), all of which are lower than the square root of its AVE, confirming discriminant validity. Job Burnout (JB) has a square root of AVE of 0.764, with correlations of 0.698 (AIA), 0.623 (ITL), and 0.743 (PPCB). Again, all correlations are lower than the square root of the AVE, supporting discriminant validity for JB. Lastly, Perceived Psychological Contract Breach (PPCB) has a square root of AVE of 0.793. The correlations with AIA (0.760), ITL (0.516), and JB (0.743) are all lower than the square root of PPCB's AVE, confirming that it is distinct from the other constructs. Overall, the results indicate that all constructs exhibit good discriminant validity, as the square roots of the AVEs are higher than the correlations between constructs, supporting the uniqueness of each construct in the model. Table (4) presents the HTMT ratios and p-values for assessing discriminant validity.

Table 4. HTMT (Heterotrait-Monotrait Ratio) for validity

HTMT ratios (good if < 0.90, best if < 0.85)	AIA	ITL	JB	PPCB
AI awareness (AIA)				
Intention to leave (ITL)	0.646			
Job burnout (JB)	0.813	0.712		
Perceived psychological contract breach (PPCB)	0.915	0.609	0.851	
P values (one-tailed) for HTMT ratios (good if < 0.05)	AIA	ITL	JB	PPCB
AI awareness (AIA)				
Intention to leave (ITL)	<0.001			
Job burnout (JB)	<0.001	<0.001		
Perceived psychological contract breach (PPCB)	0.069	<0.001	0.004	

The HTMT ratios for most constructs are below the 0.90 threshold, indicating good discriminant validity. However, the ratio between AI Awareness (AIA) and Perceived Psychological Contract Breach (PPCB) is 0.915, slightly above the recommended limit, suggesting some overlap between these two constructs. The p-values for most HTMT ratios are less than 0.05, indicating significant differences between the constructs and supporting discriminant validity, except for the AIA-PPCB pair, where the p-value is 0.069, suggesting a possible lack of full distinction between these constructs. Overall, most constructs exhibit good discriminant validity, with AIA and PPCB being a potential exception.

Structural model and testing hypotheses

The results of the hypotheses testing are presented in Figure 2 and further detailed in Tables 5 and 6. The findings reveal that AI Awareness (AIA) significantly increases employees' Intention to Leave (ITL) ($\beta = 0.20$, $p < 0.01$, $t = 3.521$), Job Burnout (JB) ($\beta = 0.74$, $p < 0.01$, $t = 14.463$), and Perceived Psychological Contract Breach (PPCB) ($\beta = 0.78$, $p < 0.01$, $t = 15.343$). These results suggest that higher levels of AIA are associated with increased ITL, JB, and PPCB, thus supporting hypotheses H1, H2, and H5. Additionally, ITL is positively influenced by both JB ($\beta = 0.40$, $p < 0.01$, $t = 7.484$) and PPCB ($\beta = 0.10$, $p = 0.04$, $t = 1.726$), indicating that an increase in ITL is often linked to higher levels of job burnout and perceived psychological contract breach, thereby confirming hypotheses H3 and H5.

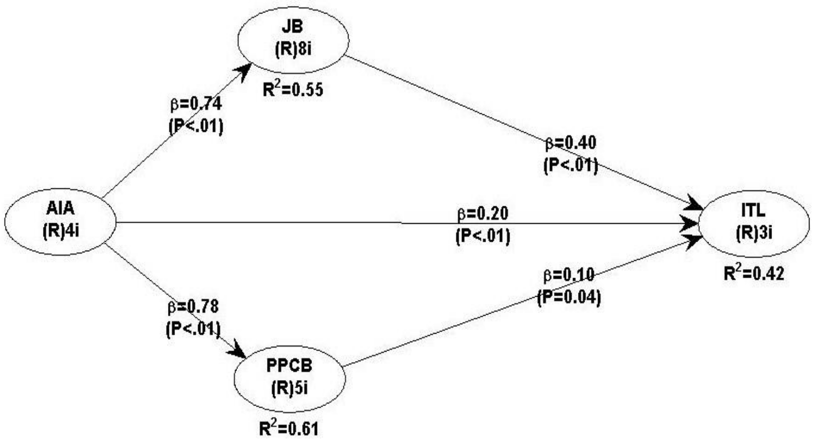

Figure 2. The final model of the study

Table 5. Direct effects

Hs	Relationship	Direct effect **(β)**	**Sig.**	T ratios for path coefficients	**Decision**
H1	AIA →ITL	0.20	P<0.01	3.521	Supported
H2	AIA → JB	0.74	P<0.01	14.463	Supported
H3	JB →ITL	0.40	P<0.01	7.484	Supported
H5	AIA →PPCB	0.78	P<0.01	15.343	Supported
H6	PPCB →ITL	0.10	P=0.04	1.726	Supported

Table 6. Mediation analysis results

		Path a	Path b	Indirect Effect	SE	t-value	Bootstrapped Confidence Interval		Decision
							95% LL	95% UL	
H4	AIA→ JB→ ITL	0.780	0.100	0.078	0.039	2.000	0.002	0.154	Mediation
H7	AIA→ PPCB→ ITL	0.740	0.400	0.296	0.039	7.590	0.220	0.372	Mediation

Finally, Table 6 presents the results of the mediation analysis for two specific paths: AIA → JB → ITL and AIA → PPCB → ITL. For Path H4 (AIA → JB → ITL), the indirect effect is 0.078, with a standard error (SE) of 0.039. The t-value is 2.000, which is significant, and the bootstrapped confidence interval (95% LL: 0.002, 95% UL: 0.154) does not include zero, indicating that the mediation effect is statistically significant. This suggests a mediation effect of AIA on Intention to Leave (ITL) through Job Burnout (JB). For Path H7 (AIA → PPCB → ITL), the indirect effect is 0.296, with a SE of 0.039. The t-value is 7.590, which is also significant, and the bootstrapped confidence interval (95% LL: 0.220, 95% UL: 0.372) does not include zero, indicating significant mediation. This suggests a mediation effect of AIA on ITL through Perceived Psychological Contract Breach (PPCB).

DISCUSSION

This study aims to examine the effect of AI awareness on employees' intention to leave, with particular emphasis on the mediating roles of job burnout and psychological contract breach. The findings indicated that AI awareness leads to an increase in employees' intention to leave, job burnout, and perception of psychological contract breach. These results align with previous studies conducted by Hassan et al. (2024) and Khairy et al. (2024). AI awareness can significantly impact hotel employees in multiple ways, increasing their intention to leave, contributing to job burnout, and heightening their perception of a psychological contract breach. As employees become more aware of AI's capabilities, such as automation and AI-powered systems, they may fear job displacement and feel their skills are becoming obsolete, leading to job insecurity and a desire to seek more secure employment (Farhan, 2023; Khairy et al., 2024). This uncertainty and lack of control over AI implementation can also trigger chronic stress (Liang et al., 2022; Xu et al., 2023), contributing to burnout. Employees may feel overwhelmed by the constant changes AI brings to their roles and responsibilities, leading to emotional exhaustion and frustration (Hassan et al., 2024; Teng et al., 2024). Furthermore, AI's impact on job roles and the lack of transparency from management can create a perception of psychological contract breach (Bankins and Formosa, 2020), with employees feeling that their job security, career development, and value within the company are being undermined. Ethical concerns, such as AI's potential bias or displacement of human workers, can deepen these feelings, further increasing the likelihood of employees considering leaving the organization for a more stable and fulfilling work environment (Caporusso, 2023; Khogali & Mekid, 2023). The findings also showed that job burnout not only increases employees' intention to leave but also mediates the relationship between AI awareness and employees' intention to leave.

These results are consistent with the findings of previous research conducted by Baquero (2023), Salama et al. (2022), Kong et al. (2021), and Teng et al. (2023). Job burnout plays a significant role in increasing hotel employees' intention to leave, as it is driven by chronic stress, exhaustion, and decreased job satisfaction. Employees experiencing burnout often seek relief by leaving their jobs, as they feel less engaged and invested in their work, making them more likely to consider turnover (Potter, 2009). The constant pressure of hotel work can overwhelm employees, and the physical and mental toll can prompt them to leave for the sake of their well-being. Burnout is also closely linked to a sense of dissatisfaction (Nápoles, 2022), as employees no longer find their work fulfilling and feel less motivated. Additionally, job burnout can mediate the relationship between AI awareness and employees' intention to leave. As employees become more aware of AI's growing presence, concerns such as job insecurity, uncertainty about the future, and lack of control over AI's implementation can lead to significant stress and ultimately burnout. This burnout, characterized by emotional exhaustion and a sense of powerlessness, makes employees more likely to seek new opportunities, driven by a desire for relief, greater control, and a healthier work environment (Potter, 2009; Aljaier et al., 2025).

Finally, the findings revealed that psychological contract breach increases employees' intention to leave and mediates the relationship between AI awareness and employees' intention to leave. These results are consistent with findings from previous research conducted by Qadri et al. (2022), Kyaw (2023), Hassan et al. (2024), and Khairy et al. (2024). Psychological contract breach is a key factor in increasing hotel employees' intention to leave, as it creates feelings of betrayal, dissatisfaction, and mistrust. When employees perceive that their employer is not fulfilling promises related to job security, career development, or fair treatment, their commitment to the organization declines (Sturges et al., 2005; Gharib and Khairy, 2019). This breach of trust reduces job satisfaction, leading to disengagement and a diminished sense of loyalty, ultimately pushing employees to seek more fulfilling and supportive opportunities elsewhere. Additionally, psychological contract breach can mediate the relationship between AI awareness and employees' intention to leave. As employees become more aware of AI's growing role in the workplace, concerns about job insecurity, deskilling (Farhan, 2023), and a lack of control over AI implementation can lead to the perception that the employer is not honoring promises related to job security and career growth (Adams-Prassl, 2019; Bhargava et al., 2021). These AI-related anxieties, combined with feelings of devaluation and unfairness (Kim et al., 2023; Khairy et al., 2024), contribute to a sense of psychological contract breach, which significantly increases employees' intention to leave in search of more secure, rewarding, and supportive work environments where their contributions are valued and they have greater control over their future.

Theoretical implications

The study contributes significantly to the theoretical understanding of AI awareness and employee behavior, particularly in the hospitality sector. It extends existing theories by showing that AI awareness does not directly lead to turnover but instead triggers a series of psychological and emotional responses—such as burnout and perceived psychological contract breach—that ultimately influence employees' intention to leave. This insight enhances the theoretical framework connecting technological changes in the workplace with employee attitudes and behaviors, specifically in industries like hospitality, which are highly impacted by technological advancements.

Moreover, the research offers valuable contributions to the development of job burnout theory. It highlights how burnout in technology-driven environments, such as those integrating AI, can be exacerbated by concerns over job displacement and a lack of control over AI implementation. This nuanced perspective broadens traditional burnout theory, which typically focuses on job demands, and encourages further exploration into the complex relationship between burnout, technological adoption, and work stress in sectors reliant on both human labor and technology.

The research also advances psychological contract theory by demonstrating how AI awareness can alter employees' perceptions of their employer's fulfillment of unwritten promises, particularly in areas like job security, career development, and fair treatment. This theoretical contribution underscores the importance of clear communication and expectation management during technological transitions and suggests that AI adoption can reshape the psychological contract in ways that affect employee trust, commitment, and retention. The study calls for more research on how technological changes impact employees' trust in employers and their overall sense of psychological safety and value. Finally, from a human resource management perspective, the study provides theoretical insights into the need for HR practices to evolve in response to AI integration. It stresses the importance of not only developing technical skills but also addressing the emotional and psychological impacts of AI awareness. This highlights the need for HR strategies that prevent burnout and psychological contract breaches, ensuring employees feel secure, valued, and included in the evolving technological landscape.

Practical implications

Hotel managers should carefully manage AI awareness to mitigate its negative impact on employee turnover. Clear and transparent communication about AI's role as a tool to enhance efficiency, rather than replace human workers, can reduce job insecurity. Addressing concerns and providing information about how AI will affect roles can help employees feel more secure and reduce their intention to leave. Additionally, investing in skill development programs is crucial. Offering training that helps employees acquire AI-relevant skills can alleviate fears of obsolescence, while boosting confidence and job satisfaction. Training in areas such as customer service, leadership, and problem-solving can empower employees and prevent job burnout, further lowering turnover intentions. In addition to skill development, hotels must focus on managing job burnout, which is directly linked to AI awareness. Implementing stress management programs, providing counseling services, and supporting mental health can help employees handle AI-related stress. Encouraging work-life balance and reducing excessive demands can alleviate burnout, making employees feel supported and less inclined to leave. Moreover, involving employees in decisions about AI integration can reduce feelings of powerlessness and frustration, addressing both job burnout and psychological contract breach. By giving employees a voice in how AI is implemented, managers can enhance their sense of control, fairness, and agency, which can lower their desire to leave.

Trust and communication are also essential in maintaining a healthy work environment. Managers should ensure open, honest conversations about how AI will affect employees' roles, addressing any ethical concerns, such as data privacy and bias. Transparent communication helps employees feel valued and reduces the likelihood of perceived psychological contract breaches. Further, hotels should provide career growth paths that incorporate AI, ensuring that employees see their future in the organization despite technological advancements. Offering opportunities for career development, particularly in roles where human skills remain central, helps employees view AI as an enhancement to their careers rather than a threat. Lastly, fostering a supportive work environment where employees are recognized, rewarded, and treated fairly is key to increasing engagement and commitment, which ultimately reduces their intention to leave.

Limitations and further research directions

The limitations of this study present several opportunities for further research. Given the cross-sectional design, future studies could employ a longitudinal approach to better capture the causal relationships between AI awareness, job burnout, psychological contract breach, and employees' intention to leave. Additionally, the focus on five-star hotel employees in Egypt limits the generalizability of the findings, so comparative research across different industries and countries would provide a more comprehensive understanding of how AI awareness impacts employees in varied contexts. The reliance on self-reported data calls for the incorporation of alternative methods, such as interviews or behavioral data, to enrich the findings. Furthermore, exploring the role of demographic factors, such as age and job tenure, could reveal how these variables moderate the impact of AI awareness on burnout and turnover intentions. Finally, investigating the role of organizational support, HR interventions, and different types of AI implementation could help identify strategies to mitigate the negative effects of AI on employees, offering actionable insights for both researchers and practitioners.

Appendix (A): Measurement items

AI awareness
▪ I am personally worried about my future in my industry due to AI replacing employees.
▪ I am personally worried about my future in my organization due to AI replacing employees.
▪ I am personally worried that what I do now in my job will be able to be replaced by AI.
▪ I think AI could replace my job.
Job burnout
▪ My work keeps me from my family activities more than I would like
▪ The time I must devote to my job keeps me from participating equally in household responsibilities and activities.
▪ The time I spend with my family often causes me not to spend time at work activities that could be helpful to my career.
▪ The time I spend on family responsibilities often interferes with my work responsibilities
▪ I am often so emotionally drained when I get home from work that it prevents me from contributing to my family.

▪ Due to all the pressures at work, sometimes when I come home, I am too stressed to do the things I enjoy.
▪ The problem-solving behaviors I use in my job are not effective in resolving problems at home.
▪ The behaviors that work for me at home do not seem to be effective at work.
Intention to leave
▪ I will probably be looking for another job soon.
▪ It would not take much to make me leave this hotel.
▪ I often think about leaving this hotel.
Perceived psychological contract breach (PPCB)
▪ Almost all the promises made by my employer during recruitment have been kept so far (reversed)
▪ I feel that my employer has come through in fulfilling the promises made to me when I was hired (reversed)
▪ So far my employer has done an excellent job of fulfilling its promises to me (reversed)
▪ I have not received everything promised to me in exchange for my contributions.
▪ My employer has broken many of its promises to me even though I've upheld my side of the deal.

Appendix (B) Model fit and quality indices

Measures	**Assessment**	**Criterion**	Result
Average path coefficient (APC)	0.444, P<0.001	P<0.05	Yes
Average R-squared (ARS)	0.525, P<0.001	P<0.05	Yes
Average adjusted R-squared (AARS)	0.522, P<0.001	P<0.05	Yes
Average block VIF (AVIF)	2.879	Acceptable if <= 5, ideally <= 3.3	Yes
Average full collinearity VIF (AFVIF)	2.553	Acceptable if <= 5, ideally <= 3.3	Yes
Tenenhaus GoF (GoF)	0.589	Small >= 0.1, medium >= 0.25, large >= 0.36	Yes
Sympson's paradox ratio (SPR)	1.000	Acceptable if >= 0.7, ideally = 1	Yes
R-squared contribution ratio (RSCR)	1.000	Acceptable if >= 0.9, ideally = 1	Yes
Statistical suppression ratio (SSR)	1.000	Acceptable if >= 0.7	Yes
Nonlinear bivariate causality direction ratio (NLBCDR)	1.000	Acceptable if >= 0.7	Yes

Author Contributions: Conceptualization, W.M.S., H.A.K., and A.A.M.; methodology, W.M.S., H.A.K., and A.A.M; software, H.A.K., and A.A.M.; validation, H.A.K., and A.A.M.; formal analysis, H.A.K., and A.A.M.; investigation, W.M.S., H.A.K., and A.A.M..; data curation, W.M.S., H.A.K., and A.A.M.; writing - original draft preparation, W.M.S., H.A.K., A.A.M.,W.M.A., S.A., A.T.A.S.; writing - review and editing, W.M.S., H.A.K., A.A.M.,W.M.A., S.A., A.T.A.S.; visualization, W.M.S., H.A.K., and A.A.M..; supervision, H.A.K., and A.A.M..; project administration, W.M.S., H.A.K., and A.A.M.. All authors have read and agreed to the published version of the manuscript.

Funding: This work was supported by the Deanship of Scientific Research, Vice Presidency for Graduate Studies and Scientific Research, King Faisal University, Saudi Arabia [KFU251199].

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgments: This work was supported by the Deanship of Scientific Research, Vice Presidency for Graduate Studies and Scientific Research, King Faisal University, Saudi Arabia [KFU251199].

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Abbas, A. A., & Al Hasnawi, H. H. (2020). Role of Psychological Contract Breach and Violation in Generating Emotional Exhaustion: The Mediating Role of Job Procrastination. *Cuadernos de Gestion*, 20(3), 15–28. https://doi.org/10.5295/cdg.181021aa

Abdalla, M. J., Said, H., Ali, L., Ali, F., & Chen, X. (2021). COVID-19 and unpaid leave: Impacts of psychological contract breach on organizational distrust and turnover intention: Mediating role of emotional exhaustion. *Tour Manag Perspect*. 39:100854. https://doi.org/10.1016/j.tmp.2021

Achmad, L. I., Noermijati., Rofiaty., & Irawanto, D. W. (2023). Job Satisfaction and Employee Engagement as Mediators of the Relationship Between Talent Development and Intention to Stay in Generation Z Workers, Intern. *Journal of Profess. Bus. Review*, Miami, v. 8(1) ,p. 01-19. https://doi.org/10.26668/businessreview/2023.v8i1.814

Adams-Prassl, J. (2019). What if your boss was an algorithm? Economic incentives, legal challenges, and the rise of artificial intelligence at work. *Comp. Lab. L. & Pol'y J.*, *41*, 123. https://ora.ox.ac.uk/objects/uuid:674dbed4-317d-47a9-b10a-688892aeaf34

Agina, M. F., Farrag, D. A., Khairy, H. A., Alhemimah, A., & Al-Romeedy, B. S. (2025). Talent management and innovative work behavior in tourism and hospitality businesses: Does absorptive capacity matter? *Journal of Human Resources in Hospitality & Tourism*, *24*(2), 367-391. https://doi.org/10.1080/15332845.2025.2432621

Ahmed, W., Kiyani, A., & Hashmi, S. H. (2013). *The Study On Organizational Cynicism, Organizational Injustice & Breach Of Psychological Contract As The Determinants Of Deviant Work Behavior.* Actual Problems Of Economics.

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Aldoseri, A., Al-Khalifa, K. N., & Hamouda, A. M. (2024) AI-Powered Innovation in Digital Transformation: Key Pillars and Industry Impact. *Sustainability*, 16, 1790. https://doi.org/10.3390/su16051790

Alia, F. B., Gulb, S., Khan, A., & Sher Alam (2020). Psychological Contract Breach & Workplace Deviance: Study Of Higher Education Institutions In Peshawar, Iqra. *Journal of Business & Management* (IJBM) 4(1), 94-121.

Aljaier, O., Alzubi, A., Khadem, A., & Iyiola, K. (2025). Exploring the Impact of Workplace Hazing on Deviant Behavior in the Hospitality Sector: The Roles of Emotional Exhaustion and Hope and Optimism. *Behavioral Sciences*, *15*(2), 129.

Allen, D. G., Bryant, P. C., & Vardaman, J. M. (2010). Retaining talent: Replacing misconceptions with evidence-based strategies. Academy of Management Perspectives, 24(2), 48–64. https://doi.org/10.5465/amp.24.2.48

Ananny, M., & Crawford, K. (2018). Seeing without knowing: Limitations of the transparency ideal and its application to algorithmic accountability. *New Media & Society*, 20(3), 973–989. https://doi.org/10.1177/1461444816676645

Argyris, C. (1960). Understanding organizational behavior. Dorsey Press.

Autor, D., Mindell, D., & Reynolds, E. (2022). *The work of the future: Building better jobs in an age of intelligent machines*. MIT Press.

Babakus, E., Yavas, U., & Karatepe, O. M. (2008). The effects of job demands, job resources and intrinsic motivation on emotional exhaustion and turnover intentions: A study in the Turkish hotel industry. I*nternational Journal of Hospitality and Tourism Administration*, 9(4), 384–404. https://doi.org/10.1080/15256480802427339

Baber, M. M., Durrani, D. K., & Lateef, F. (2022). The Relationship between Psychological Contract Breach and Psychological Contract Violation: The interactive effects of Tenure, *Pakistan Languages and Humanities Review* (PLHR), 6(3), 272-288.

Bai, S., Zhang, X., Yu, D., & Yao, J. (2024). Assist me or replace me? Uncovering the influence of AI awareness on employees' counterproductive work behaviors. *Front Public Health*.12:1449561. https://doi.org/ 10.3389/fpubh.2024.1449561

Bail, C., Harth, V., & Mache, S. (2023). Digitalization in Urology-A Multimethod Study of the Relationships between Physicians' Technostress, Burnout, Work Engagement and Job Satisfaction. Healthcare (Basel).11(16):2255. https://doi.org/ 10.3390/healthcare11162255.

Bakker, A. B., & Demerouti, E. (2007). The Job Demands-Resources Model: State of the Art. *Journal of Managerial Psychology*, 22(3), 309–328. HTTPS://DOI.ORG/ 10.1108/02683940710733115

Bal, P. M., & de Lange, A. H. (2022). Flexible Work Arrangements and Psychological Contract Breach: The Role of Idiosyncratic Deals. Human Resource Management, 61(2), 231–247. https://doi.org/10.1002/hrm.22112

Baquero, A., Khairy, H. A., & Al-Romeedy, B. S. (2025). Workplace Stressors and the Intention to Quit: The Role of Psychological Distress and Psychological Flexibility Among Hospitality Employees. *Tourism and Hospitality*, *6*(2), 72. https://doi.org/10.3390/tourhosp6020072

Bankins, S., & Formosa, P. (2020). When AI meets PC: Exploring the implications of workplace social robots and a human-robot psychological contract. *European Journal of Work and Organizational Psychology*, *29*(2), 215-229. https://doi.org/10.1080/1359432x.2019.1620328

Baquero, A. (2023). Hotel employees' burnout and intention to quit: the role of psychological distress and financial well-being in a moderation mediation model. *Behavioral Sciences*, *13*(2), 84. https://doi.org/10.3390/bs13020084

Bhargava, A., Bester, M., & Bolton, L. (2021). Employees' perceptions of the implementation of robotics, artificial intelligence, and automation (RAIA) on job satisfaction, job security, and employability. *Journal of Technology in Behavioral Science*, *6*(1), 106-113. https://doi.org/10.1007/s41347-020-00153-8

Boscardin, C. K., Gin, B., Golde P. B., & Hauer, K. E. (2024). Chatgpt and generative artificial intelligence for medical education: potential impact and opportunity. Acad Med. (2024) 99:22–7. https://doi.org/10.1097/acm.0000000000005439

Braganza, A., Chen, W., Canhoto, A., & Sap, S. (2021). Productive employment and decent work: The impact of AI adoption on psychological contracts, job engagement and employee trust. *Journal of Business Research*, 131, 485–494. https://doi.org/ 10.1016/j.jbusres.2020.08.018

Brougham, D., & Haar, J. (2018). Smart technology, artificial intelligence, robotics, and algorithms (STARA): Employees' perceptions of our future workplace. *Journal of Management & Organization*, *24*(2), 239-257. https://doi.org/10.1017/jmo.2016.55

Brundage, M., Avin, S., Clark, J., Toner, H., Eckersley, P., Garfinkel, B., & Amodei, D. (2018). The malicious use of artificial intelligence: Forecasting, prevention, and mitigation. arXiv preprint arXiv:1802.07228. https://arxiv.org/abs/1802.07228

Brynjolfsson, E. (2022). The Turing Trap: The Promise & Peril of Human-Like Artificial Intelligence. *Daedalus* 2022; 151 (2): 272–287. https://doi.org/10.1162/daed_a_01915

Brynjolfsson, E., & McAfee, A. (2023). *The Turing Trap: The promise & peril of human-like artificial intelligence*. *Daedalus, 151*(2), 272–287. https://doi.org/10.1162/daed_a_01915

Buolamwini, J., & Gebru, T. (2018). *Gender Shades: Intersectional Accuracy Disparities in Commercial Gender Classification*. Proceedings of Machine Learning Research, 81, 1–15. http://proceedings.mlr.press/v81/buolamwini18a.html

Caporusso, N. (2023). Generative artificial intelligence and the emergence of creative displacement anxiety. *Research Directs in Psychology and Behavior, 3*(1). https://doi.org/10.53520/rdpb2023.10795

Cassar, V., & Briner, R. B. (2011). The Relationship Between Psychological Contract Breach And Organizational Commitment: Exchange Imbalance As A Moderator Of The Mediating Role Of Violation. *Journal Of Vocational Behavior*, 78, 283-289.

Conway, N., & Briner, R. B. (2005). Understanding psychological contracts at work: A critical evaluation of theory and research. *Oxford University Press.*

Conway, Neil, & Rob, B. (2011). Briner, *Understanding Psychological Contracts at Work: A Critical Evaluation of Theory and Research* (Oxford, 2005; online edn, Oxford Academic. https://doi.org/10.1093/acprof:oso/9780199280643.001.0001

Dignum, V. (2019). *Responsible Artificial Intelligence: How to Develop and Use AI in a Responsible Way*. Cham: Springer. https://doi.org/10.1007/978-3-030-30371-6

Farhan, A. (2023). The Impact of Artificial Intelligence on Human Workers. *Journal Of Communication Education*, *17*(2), 93-104.

Floridi, L., Cowls, J., Beltrametti, M., Chatila, R., Chazerand, P., Dignum, V., & Vayena, E. (2018). AI4People—An ethical framework for a good AI society. *Minds and Machines*, 28(4), 689–707. https://doi.org/10.1007/s11023-018-9482-5

García-Madurga, M. Á., Gil-Lacruz, A. I., Saz-Gil, I., & Gil-Lacruz, M. (2024). The Role of Artificial Intelligence in Improving Workplace Well-Being: A Systematic Review. *Businesses* , *4*, 389-410. https://doi.org/10.3390/businesses4030024

Gharib, R., & Khairy, H. A. (2019). An examination of the relationships among organizational cynicism, organizational commitment, and psychological contract in the hotel industry. *International Journal of Heritage, Tourism and Hospitality*, *13*(2), 85-104. http://dx.doi.org/10.21608/ijhth.2019.92755

Gong, B., & Sims, R. L. (2023). Psychological contract breach during the pandemic: How an abrupt transition to a work from home schedule impacted the employment relationship. *J Bus Res*. 154:113259. https://doi.org/ 10.1016/j.jbusres.2022.08.023

Griffeth, R. W., Hom, P. W., & Gaertner, S. (2000). A Meta-Analysis of Antecedents and Correlates of Employee Turnover. *Journal of Management*, 26(3), 463–488. https://doi.org/ 10.1177/014920630002600305

Güveyi, E., Elvin, G., Kennedy, A., Kurt, Z., Sice, P., Patel, P., Dubruel, A., & Heckels, D. (2025). Understanding emotional and health indicators underlying the burnout risk of healthcare workers. *PLOS ONE, 20*(1), e0302604. https://doi.org/10.1371/journal.pone.0302604

Hair, J. F., Black, W. C., Balin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis*: Maxwell Macmillan International Editions. https://link.springer.com/chapter/10.1007/978-3-030-06031-2_16

Hassan, A. H., Baquero, A., Salama, W. M., & Ahmed Khairy, H. (2024). Engaging Hotel Employees in the Era of Artificial Intelligence: The Interplay of Artificial Intelligence Awareness, Job Insecurity, and Technical Self-Efficacy. *Journal of Logistics, Informatics and Service Science*, 11(5), 522-539. https://doi.org/10.33168/JLISS.2024.0530

Hom, P. W., Lee, T. W., Shaw, J. D., & Hausknecht, J. P. (2017). One hundred years of employee turnover theory and research. *Journal of Applied Psy*chology, 102(3), 530–545.

Irfan, M., Khalid, R. A., Kaka Khel, S. S. U. H., Maqsoom, A., & Sherani, I. K. (2023). Impact of work–life balance with the role of organizational support and job burnout on project performance. *Engineering, Construction and Architectural Management*, *30*(1), 154-171. http://dx.doi.org/10.1108/ECAM-04-2021-0316

Ivana, P. R., Marumpe, D. P., Daud, I., & Yakin, I. (2025). Impact of psychological contract breach and ethical leadership on turnover intention: Emotional exhaustion as mediator. *Journal of Management Science (JMAS)*, *8*(1), 243-253. https://doi.org/10.35335/jmas.v8i1.601

Jasim, T. A., Moneim, A. A., El-Sayed, S. F., Khairy, H. A., & Fayyad, S. (2024). Understanding The Nexus Between Abusive Supervision, Knowledge Hiding Behavior, Work Disengagement, And Perceived Organizational Support In Tourism And Hospitality Industry. *Geo Journal of Tourism and Geosites*, *55*(3), 1039-1054. https://doi.org/10.30892/gtg.55306-1278

Jiang, L., & Lavaysse, L. M. (2018). Cognitive and Affective Job Insecurity: A Meta-Analysis and a Primary Study. *Journal of Management*, 44(6), 2307–2342.

Jobin, A., Ienca, M., & Vayena, E. (2019). The global landscape of AI ethics guidelines. *Nat Mach Intell* 1, 1(9), 389–399. https://doi.org/10.1038/s42256-019-0088-2

Kaya, B., & Karatepe, O. M. (2020). Attitudinal and behavioral outcomes of work-life balance among hotel employees: The mediating role of psychological contract breach. *Journal of Hospitality and Tourism Management*, 42, 199–209. https://doi.org/10.1016/j.jhtm.2020.01.003

Khairy, H. A., Ahmed, M., Asiri, A., Gazzawe, F., Abdel Fatah, M. A., Ahmad, N., & Agina, M. F. (2024). Catalyzing green work engagement in hotel businesses: Leveraging artificial intelligence. *Sustainability*, *16*(16), 7102. https://doi.org/10.3390/su16167102

Khairy, H. A., Agina, M. F., Ahmad, M. S., & Fayyad, S. (2025). Distributive injustice effect on employee's innovative behavior in hotels: Roles of workplace envy and workplace spirituality. *Journal of Human Resources in Hospitality & Tourism*, 1-28. https://doi.org/10.1080/15332845.2025.2484949

Khogali, H. O., & Mekid, S. (2023). The blended future of automation and AI: Examining some long-term societal and ethical impact features. *Technology in Society*, *73*, 102232. https://dx.doi.org/10.2139/ssrn.4239580

Kim, B. J., & Lee, J. (2024). The mental health implications of artificial intelligence adoption: the crucial role of self-efficacy. *Humanit Soc Sci Commun* 11, 1561. https://doi.org/10.1057/s41599-024-04018-w

Kiron, D., Altman, E. J., & Riedl, C. (2023). Workforce ecosystems and AI. Brookings Institution.

Kock, N. (2021). WarpPLS User Manual: Version 7.0. Laredo, TX: ScriptWarp Systems. Available at https://www.scriptwarp.com/

Kong, H., Yuan, Y., Baruch, Y., Bu, N., Jiang, X., & Wang, K. (2021). Influences of artificial intelligence (AI) awareness on career competency and job burnout. *International Journal of Contemporary Hospitality Management*, *33*(2), 717-734. https://doi.org/10.1108/IJCHM-07-2020-0789

Kwon, J. E. (2022). The Impact of Career Plateau on Job Burnout in the COVID-19 Pandemic: A Moderating Role of Regulatory Focus. *International Journal of Environmental Research and Public Health*, 19(3), 1087. https://doi.org/10.3390/ijerph19031087

Kyaw, H. H. Y. (2023). The Effect of AI Awareness, Perceived Job Security, Employee Engagement, and Self-efficacy on Turnover Intention among Thai Employees in Hotel Business. Master Thesis. Bangkok University. http://dspace.bu.ac. th/jspui/handle/123456789/5482

Li, J., Bonn, M. A., & Ye, B. H. (2019). Hotel employee's artificial intelligence and robotics awareness and its impact on turnover intention: the moderating roles of perceived organizational support and competitive psychological climate. *Tour Manag*. 73:172–81. https://doi.org/ 10.1016/j.tourman.2019.02.006.

Liang, X., Guo, G., Shu, L., Gong, Q., & Luo, P. (2022). Investigating the double-edged sword effect of AI awareness on employee's service innovative behavior. *Tourism Management*, *92*, 104564. https://doi.org/10.1016/j.tourman.2022.104564

Mahapatra, M., & Pati, S. (2018). Technostress Creators and Burnout: A Job Demands-Resources Perspective, Association for Computing Machinery, 70-77, https://doi.org/10.1145/3209626.3209711

Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Occupational Behavior*, 2(2), 99-113. https://doi.org/10.1002/job.4030020205

Maslach, C., & Leiter, M. P. (2016). *Understanding the burnout experience: Recent research and its implications for psychiatry.* World Psychiatry, 15(2), 103-111. https://doi.org/10.1002/wps.20311

Maslach, C., Jackson, S. E., & Leiter, M. P. (1997). *Maslach burnout inventory*. Scarecrow Education. Available at https://www.mindgarden.com/117-maslach-burnout-inventory-mbi

Mat Rifin, H., & Danaee, M. (2022). Association between Burnout, Job Dissatisfaction and Intention to Leave among Medical Researchers in a Research Organisation in Malaysia during the COVID-19 Pandemic. *International Journal of Environmental Research and Public Health*, 19(16), 10017. https://doi.org/10.3390/ijerph191610017

McKinsey Global Institute. (2023). Generative AI and the future of work in America. McKinsey & Company.

Meier, S. T., & Kim, S. (2022). Meta-regression analyses of relationships between burnout and depression with sampling and measurement methodological moderators. *Journal of Occupational Health Psychology*, 27(2), 195–206. https://doi.org/10.1037/ocp0000273

Mittelstadt, B. D., Allo, P., Taddeo, M., Wachter, S., & Floridi, L. (2016). The ethics of algorithms: Mapping the debate. *Big Data & Society*, *3*(2), 1–21. https://doi.org/10.1177/2053951716679679

Morrison, E. W. (1993). Newcomer information seeking: Exploring types, modes, sources, and outcomes. *Academy of management Journal*, *36*(3), 557-589. https://doi.org/10.5465/256592

Nápoles, J. (2022). Burnout: A review of the literature. *Update: Applications of Research in Music Education*, *40*(2), 19-26. https://doi.org/10.1177/87551233211037669

Nazareno, L., & Schiff, D. S. (2021). The impact of automation and artificial intelligence on worker well-being. *Technology in Society*, *67*, 101679. https://doi.org/10.1016/j.techsoc.2021.101679

Nomura, T., Kanda, T., Suzuki, T., & Yamada, S. (2020). Do people with social anxiety feel anxious about interacting with a robot? *AI & SOCIETY* (2020) 35:381–390. https://doi.org/10.1007/s00146-019-00889-9

Parker, S., & Grote, G. (2022). Automation, Algorithms, and Beyond: Why Work Design Matters More Than Ever in Digital World. *Applied Psychology*. 2022;71:1171–1204.

Pavuluri, S., Sangal, R., & Sather, J. (2024). Taylor RA. Balancing act: the complex role of artificial intelligence in addressing burnout and healthcare workforce dynamics. *BMJ Health Care Inform*. 2024 Aug 24, 31(1), e101120. https://doi.org/ 10.1136/bmjhci-2024-101120

Poku, C. A., Bayuo, J., Agyare, V. A. Sarkodie, N. K., & Bam, V.(2025). Work engagement, resilience and turnover intentions among nurses: a mediation analysis. *BMC Health Serv Res* 25, 71 (2025). https://doi.org/10.1186/s12913-025-12242-6

Potter, B. A. (2009). *Overcoming job burnout: How to renew enthusiasm for work*. Ronin Publishing.

Qadri, S. U., Li, M., Ma, Z., Qadri, S., Ye, C., & Usman, M. (2022). Unpaid leave on COVID-19: the impact of psychological breach contract on emotional exhaustion: the mediating role of job distrust and insecurity. *Frontiers in psychology*, *13*, 953454.

Rahwan, I. (2018). Society-in-the-Loop: Programming the Algorithmic Social Contract. *Ethics and Information Technology*, 20(1), 5–14. https://doi.org/10.1007/s10676-017-9430-8

Robinson, S. L., & Wolfe Morrison, E. (2000). The development of psychological contract breach and violation: A longitudinal study. *Journal of organizational Behavior*, *21*(5), 525-546. https://doi.org/10.1002/1099-1379(200008)21:5%3C525::AID-JOB40%3E3.0.CO;2-T

Rotenstein, L. S., Brown, R., Sinsky, C., & Linzer, M. (2023). The Association of Work Overload with Burnout and Intent to Leave the Job Across the Healthcare Workforce During COVID-19. *Journal of General Internal Medicine*, *38*(1), 89–96. https://doi.org/10.1007/s11606-023-08153-z

Rousseau, D. M. (1989). Psychological and implied contracts in organizations. *Employee Responsibilities and Rights Journal*, 2(2), 121–139. https://doi.org/10.1007/BF01384942

Rousseau, D. M. (1995). Psychological contracts in organizations: Understanding written and unwritten agreements. *Sage Publications, Inc.*

Ryan, E., Hore, K., Power, J., & Jackson, T. (2023). The relationship between physician burnout and depression, anxiety, suicidality and substance abuse: A mixed methods systematic review. *Front Public Health*. 11:1133484. https://doi.org/ 10.3389/fpubh.2023.1133484

Said, H., Ali, L., Ali, F., & Chen, X. (2021). COVID-19 and unpaid leave: Impacts of psychological contract breach on organizational distrust and turnover intention: Mediating role of emotional exhaustion. *Tourism management perspectives*, *39*, 100854. https://doi.org/10.1016/j.tmp.2021.100854

Salama, W., Abdou, A. H., Mohamed, S. A. K., & Shehata, H. S. (2022). Impact of work stress and job burnout on turnover intentions among hotel employees. *International Journal of Environmental Research and Public Health*, *19*(15), 9724. https://doi.org/10.3390/ijerph19159724

Salama, W. M., Khairy, H. A., Badwy, H. E., Afify, S. M., Alrefae, W. M. M., & Soliman, S. A. E. M. (2025). How abusive leadership could harm employee job engagement in hotel businesses? The roles of perceived organizational politics and presenteeism. *Intangible Capital*, *21*(1), 168-192. https://doi.org/10.3926/ic.3104

Salvagioni, D. A. J., Melanda, F. N., Mesas, A. E., González, A. D., Gabani, F. L., & Andrade, S. M. d. (2017). Physical, psychological and occupational consequences of job burnout: A systematic review of prospective studies. *PLoS ONE*, 12(10), e0185781. https://doi.org/10.1371/journal.pone.0185781

Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior*, 25(3), 293-315. https://doi.org/10.1002/job.248

Selenko, E., Bankins, S., Shoss, M., Warburton, J., & Restubog, S. L. D. (2022). Artificial Intelligence and the Future of Work: A Functional-Identity Perspective. *Current Directions in Psychological Science*, *31*(3), 272-279.

Shneiderman, B. (2022). *Human-centered AI: Ensuring human control in critical decision-making*. Oxford University Press.

Shneiderman, B. (2020). Bridging the gap between ethics and practice: Guidelines for trustworthy AI systems. A*CM Transactions on Interactive Intelligent Systems,* 10(4), 1–31. https://doi.org/ 10.1145/3419764

Singh, S., & Dhan, S. A., (2023). A theoretical Review on Psychological Contract, *Social Science and Humanities Journal*, 7(8), 3137-3142. https://doi.org/10.18535/sshj.v7i08.866

Sturges, J., Conway, N., Guest, D., & Liefooghe, A. (2005). Managing the career deal: The psychological contract as a framework for understanding career management, organizational commitment and work behavior. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, *26*(7), 821-838. https://doi.org/10.1002/job.335

Suseno, Y., Standing, C., Gengatharen, D., & Nguyen, D. (2022). *Artificial intelligence (AI) awareness: Its impact on job burnout and turnover intentions*. Journal of Organizational Behavior, 43(5), 731-750. https://doi.org/10.1002/job.2635

Taddeo, M., & Floridi, L. (2018). *How AI Can Be a Force for Good. Science*. 361(6404), 751–752. https://doi.org/10.1126/science.aat5991

Teng, R., Zhou, S., Zheng, W., & Ma, C. (2023). Artificial intelligence (AI) awareness and work withdrawal: Evaluating chained mediation through negative work-related rumination and emotional exhaustion. *International Journal of Contemporary Hospitality Management*, 35(7), 2311-2326. https://doi.org/10.1108/ijchm-02-2023-0240

Tett, R. P., & Meyer, J. P. (1993). Job Satisfaction, Organizational Commitment, Turnover Intention, and Turnover: Path Analyses Based on Meta-Analytic Findings. *Personnel Psychology*, 46(2), 259–293. https://doi.org/10.1111/j.1744-6570.1993.tb00874.x.

The Egyptian Ministry of Tourism and Antiquities. (2022). *Hotel and tourism companies and establishments.* Directory of hotel establishments and tourism companies, the Ministry of Tourism: Egypt. Retrieved from: https://mota.gov.eg/ar/

Topa, G. Aranda-Carmena, M., & De-Maria, B. (2022). Psychological Contract Breach and Outcomes: A Systematic Review of Reviews. *Int J Environ Res Public Health,* 19(23), 15527. https://doi.org/ 0.3390/ijerph192315527.

Wang, H., Ding, H., & Kong, X. (2023). Understanding technostress and employee well-being in digital work: the roles of work exhaustion and workplace knowledge diversity. *International Journal of Manpower*, 44 (2), 334-353. https://doi. org/10.1108/IJM-08-2021-0480

West, C. P., & Dyrbye, L. N. (2016). Erwin PJ, Shanafelt TD. Interventions to prevent and reduce physician burnout: a systematic review and meta-analysis. *Lancet*. 388(10057):2272-2281. https://doi. org/10.1016/S0140-6736(16)31279

Xie, X., Liu, H., & Deng, H. (2015). Psychological contract breach and turnover intention: The intermediary role of job satisfaction. *Open Journal of Business and Management*, 03(04), 371. https://doi. org/10.4236/ojbm.2015.34036

Xu, G., Xue, M., & Zhao, J. (2023). The association between artificial intelligence awareness and employee depression: the mediating role of emotional exhaustion and the moderating role of perceived organizational support. *International Journal of Environmental Research and Public Health*, *20*(6), 5147. https://doi.org/10.3390/ijerph20065147

Yon, H. W., & Amiri, M. (2024). *The effects of artificial intelligence on occupational stress among IT employee*s (Project). Department of Accounting & Management, SKM Institution.

Yu, D., Yang, K., Zhao, X., Liu, Y., Wang, S., D'Agostino, M. T., & Russo, G. (2022). Psychological contract breach and job performance of new generation of employees: Considering the mediating effect of job burnout and the moderating effect of past breach experience. *Front. Psychol.* 13:985604. https://doi.org/ 10.3389/fpsyg.2022.985604

Zaza, S., Armstrong, D. J., & Riemenschneider, C. K. (2022). The influence of psychological contracts and burnout on it professionals' turnover and turnaway intention. *Communications of the Association for Information Systems*, 50. https://doi.org/10.17705/1CAIS.05023

Zhao, H., Wayne, S. J., Glibkowski, B. C., & Bravo, J. (2018). The impact of psychological contract breach on work-related outcomes: A meta-analysis. *Personnel Psychology*, 60(3), 647. https://doi. org/10.1111/j.1744-6570.2007.00087.x

Zhao, H., Wayne, S., Glibkowski, B., & Jesus, B. (2007). The Impact of Psychological Contract Breach on Work-Related Outcomes: A Meta-Analysis, *Personnel Psychology* 60(3):647-680. https://doi.org/10.1111/j.1744-6570.2007.00087

Article history: Received: 19.02.2025 Revised: 19.05.2025 Accepted: 10.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1221-1230
DOI 10.30892/gtg.602spl19-1495

WOMEN'S SENSE OF BELONGING: MODERATING ECONOMIC, SOCIOCULTURAL, AND ENVIRONMENTAL IMPACTS ON COMMUNITY-BASED TOURISM DEVELOPMENT

Omar DURRAH [1*], Ahmed Mohamed ELBAZ [2], Lujain El-MAGHRABY [3], Mohammad IRFAN [4]

[1] Dhofar University, College of Commerce and Business Administration, Department of Management, Salaalah, Oman; odurrah@du.edu.om (O.D.)
[2] University of Technology and Applied Sciences-Salalah, College of Economics and Business Administration, Department of Economics and Business Administration; University of Sadat City, Faculty of Tourism and Hotels, Sadat City, Egypt; ahmed.elbaz@utas.edu.om (A.M.E.)
[3] Majan University College, Faculty of Business Management, Department of Management, Muscat, Oman, lujain.elmaghraby@majancollege.edu.om (L.E.M.)
[4] Christ University, School of Business and Management, Bengaluru, India; drmohdirfan31@gmail.com (M.I.)

Citation: Durrah, O., Elbaz, A.M., El-Maghraby, L., & Irfan, M. (2025). Women's sense of belonging: Moderating economic, sociocultural, and environmental impacts on community-based tourism development. *Geojournal of Tourism and Geosites*, 60(2spl), 1221–1230. https://doi.org/10.30892/gtg.602spl19-1495

Abstract: Despite the tremendous development in the literature on sustainable tourism, the focus remains especially on government regulation and international cooperation. As will be seen, the present study is rare in adopting a bottom-up approach that focuses on the perceptions, attitudes, and beliefs of the communities. Therefore, this study aims to explore the positive impacts of community-based tourism, including economic, sociocultural, and environmental factors, on sustainable tourism development. Furthermore, it investigates the moderating role of women's sense of belonging in such relationships. Partial Least Squares Structural Equation Modelling (PLS-SEM) was adopted to analyze the survey results from 183 Omani women. The participants were selected via convenience sampling, therefore facilitating efficient data gathering over the course of the investigation. Convenience sampling was approved given the exploratory nature of the study and the need to gain understanding from a particular demographic group - Omani women - who significantly participate in community and tourism-related activities in Oman. Data gathering ran from January 21 to the end of February 2024. The authors and research assistants distributed the questionnaires to local markets, cultural institutions, university students and community gatherings, among other places, in order to get a diverse sample of Omani women. The study findings illustrate that economic and environmental variables significantly influence sustainable tourism development within the community-based tourism framework; however, sociocultural aspects show a lesser association. Interestingly, women's sense of belonging functions as a crucial moderating factor, amplifying the positive outcomes of economic and environmental factors on tourism sustainability. The results of the study considerably progress the theoretical knowledge of community-based tourism (CBT) by defining the complex connections between economic, social, and environmental components as well as the moderating function of a feeling of belonging (PS). This research delivers important practical uses to policymakers and tourist planners as well as community leaders in Oman who aim to develop community-based tourism. Environmental stewardship holds significant importance because its positive moderation effects strengthen the connection between ENV and STD, according to study findings.

Keywords: community-based tourism, sustainable tourism development, sense of belonging, economic, sociocultural, and environmental impacts, PLS-SEM

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INTRODUCTION

ALL CHANGES SHOULD BE MARKED IN RED

Community-based tourism (CBT) has become even more important for advancing sustainable tourist development (STD) (Zamzami et al., 2025; Sapkota et al., 2024) in the framework of the modern tendencies of the evolution of the post-industrial society, where economic growth, environmental protection, and social integration are major and sometimes contradictory goals. Emphasising the participation and management of the local stakeholders helps CBT not only to improve the quality of life of host communities but also to solve global issues such as the homogenisation of culture and environmental damage (Vu et al., 2020). The advantages of CBT - economic development, social enfranchisement, and ecological efficiency - are accepted (Elbaz et al., 2023; Khizar et al., 2023). Scholars still debate, nevertheless, their combined influence on the growth of sustainable tourism (Okpa et al., 2025). Moreover, community belonging is another unexplored element that can be the essential element improving the advantages of CBT for sustainable development. This paper seeks to explore these dynamics as a way of providing new insights into how CBT can be used to foster sustainable tourism.

Previous studies have mainly centred their discussions on the positive impacts of community-based tourism (Wani et al., 2024; Lee & Jan, 2019). The conducted studies also show that CBT programs result in the enhancement of household income and support enterprises and employment to contribute to local economic development (Mokabe et al., 2024). On the

[*] Corresponding author

environmental management aspect, CBT improves the policy in sustainable use and conservation of natural resources, while on the social aspect, it promotes unity, pride, and participation in the community decision-making process (Ghosh et al., 2025; Zielinski et al., 2020). These papers effectively demonstrate the special benefits of CBT, but they can also obscure a fuller picture of the joint impact of these factors on the development of sustainable tourism.

Furthermore, the complicated nature of the role of the sense of belonging or community attachment as one of the moderators of these relationships has been given very little attention despite the general recognition of the importance of community participation. This is unfortunate, especially in literature where such knowledge is lacking to the extent that the potential to use the full capabilities of CBT in designing treatments and policies is restricted.

Furthermore, despite the tremendous development in the literature on sustainable tourism, the focus remains especially on government regulation and international cooperation. As will be seen, the present study is rare in adopting a bottom-up approach that focuses on the perceptions, attitudes, and beliefs of the communities. This is particularly important for research that includes psychological variables in the evaluation of CBT outcomes, including the sense of belonging (Kumar &Nayak, 2019). Thus, the current research does not consider how enacted characteristics of a community may help or hinder sustainable development projects. This research fills these gaps by examining the direct consequences of CBT's benefits: economic, social, and sustainable tourism development. More importantly, it explores how a community-level sense of belonging moderates these relationships. This dual focus brings several important benefits: First, it extends the theory by proposing a conceptual model that synthesises the multidimensional effects of CBT with the psychological concept of belongingness. Second, it addresses the empirical void by investigating these relationships in practice, using sound methods to provide practical recommendations. Last but not least, it provides policy insights and recommendations for policymakers, tourism developers, and community stakeholders by outlining factors for improving the effectiveness of CBT programs.

In order to achieve these objectives of the study, this research employs a conceptual model that is based on theoretical and empirical findings. By the same token, the present study proposes that various aspects can influence the development of sustainable tourism, namely economic, sociocultural, and environmental factors.

Moreover, it is assumed that belonging mediates these interactions, which, therefore, enhances the positive effect that CBT has on their outcomes for sustainability. To test these assumptions, the study uses complex statistical analysis that makes the results reliable and valid. In addition, it offers a broad understanding of how CBT could be enhanced in order to achieve sustained benefits in favour of the communities and stakeholders.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

This research uses the Sustainable Livelihoods Framework (SLF) to offer an all-inclusive view of how CBT, STD, and belongingness in a community interact (Kunjuraman, 2023; Elbaz &Abou-Shouk, 2016). SLF focuses on the social interface of natural, financial, human, and physical forms of capital to build sustainable livelihoods. These closely align with the sociocultural, environmental, and financial impact of CBT that have been studied in this paper (Elbaz, 2013). By so doing, SLF lays a good background for exploring the manner in which CBT projects contribute to the general objectives of STDs. Furthermore, the focus of the framework on the communities' engagement and empowerment is appropriate to the objective of the study, which is to assess the weak effect of sense of belonging, as the construct matches the notion of social capital in SLF. Furthermore, SLF uses multidimensional and bottom-up approaches for sustainability, which makes it especially pertinent in the framework of this work. While many theories concentrate on a particular facet of development, SLF's all-encompassing perspective helps one to grasp the linked sociocultural, economic, and environmental consequences of CBT in reaching sustainable results (Natarajan et al., 2022). This method emphasizes the need for local action and participation, as they help one understand the moderate influence of a sense of belonging. By using SLF, the study fixes some theoretical problems with sustainable tourism research. Specifically, it looks into the link between psychological factors like belongingness and real, long-lasting results. The study guarantees theoretical strength and useful insights for legislators and community stakeholders seeking to enhance CBT operations for long-term sustainability through the use of SLF (Figure 1).

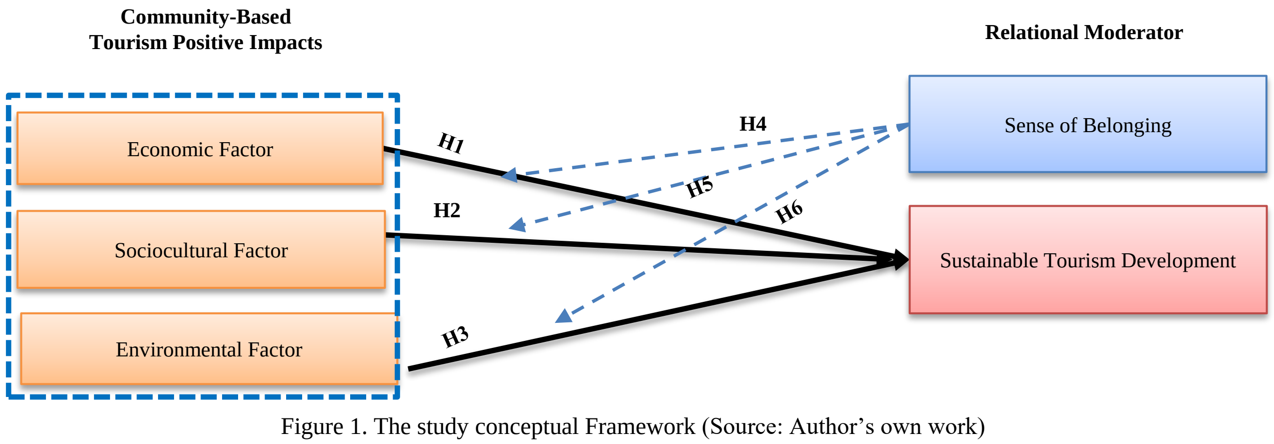

Figure 1. The study conceptual Framework (Source: Author's own work)

1. Community-based tourism's economic impacts on sustainable tourism development

Sapkota et al. (2024) define CBT as a participatory tourism development technique wherein local people actively manage tourist operations to guarantee equitable benefit distribution in accordance with their socio-economic and environmental concerns. In this context, CBT aims to empower local communities, allowing them to leverage their natural and cultural resources for sustainable development. This tourist model is essential for attaining sustainable tourism development (STD), since it concurrently tackles economic, sociocultural, and environmental aspects in a balanced and inclusive manner (Hariyadi et al., 2024). Based on Mia et al.'s (2024) research findings, the economic impact of CBT on sustainable tourism development is profound and multifaceted. First, by creating jobs in several sectors, including hotels, transportation, and cultural industries—CBT directly supports local economic development. Many times, this employment supports diversity by giving underprivileged groups—women and young people especially—income possibilities. Second, by helping locally owned companies—such as eco-lodges, cultural tours, and handcrafted goods—which meet visitor demands while thus honouring local customs, CBT promotes entrepreneurship within the community. CBT also strengthens economic vitality in a similar way that revenue generated remains within the community and does not rely on outsiders (Juma & Khademi-Vidra, 2019).

These profits further other, more general sustainable development goals and are often recirculated into sectors such as infrastructure, health, and education. CBT is a major component of the strategy for building sustainable tourism because, apart from eradicating poverty, this model creates an environment for long-term economic sustainability (Abreu et al., 2024). Thus, we propose the following theory:

H1. Community-based tourism's economic impacts positively influence sustainable tourist development.

2. Community-based tourism's sociocultural impacts on sustainable tourism development

CBT is crucial for sustainable tourism development due to the massive social impact it is likely to have. CBT empowers the local people in the planning and implementing of tourist activities, and therefore participants have an input in the tourism sector. Through this strategy, social integration is created because the people are able to pool the benefits from the earnings and activities of the tourist (Dobre et al., 2025). Additionally, Ngo et al. (2024) stated that CBT enhances local culture products, traditions, and ceremonies, thus preserving, developing, and displaying them to visitors, boosting cultural self-assertiveness. The biggest strength of CBT is that it benefits society by enhancing the well-being of local people (Elbaz et al., 2023). Through creating employment, enabling skills, and thereby enabling resource access, CBT also brings about poverty alleviation and economic equality in these communities (Wani et al., 2024). Furthermore, since people observe that there are real benefits deriving from travel, it leads to pride and responsibility (Mokabe et al., 2024). Since CBT focuses on community benefits instead of strict economic revenues, it complies with sustainable practices not to enslave or endanger the people it depends on (Lo & Janta, 2020). Indeed, based on a comprehensive review of the literature and analysing a case study, Abreu et al. (2024) established that, if well implemented, CBT can align the tourist and resident stakeholders and create a sustainable model of tourism that respects cultural integrity, promotes social equity, and sustains long-term development. Therefore, we recommend the following:

H2. Community-based tourism sociocultural initiative positively influences sustainable tourist development.

3. Community-based tourism's environmental impacts on sustainable tourism development

As a powerful tool for promoting sustainable tourist development, CBT puts a lot of emphasis on environmental stewardship. CBT management of tourism directly engages local people in the management of the tourism sector to ensure that they are responsible for the conservation of ecosystems and natural resources (Bagus et al., 2019). Shekhar (2024) argues that citizens of their environment choose the long-term sustainability of the ecosystem over its short-term profitability. Individuals practice waste minimisation, resource conservation, protection of species, and other processes that are required in the development process for sustainability (Dangi & Jamal, 2016). CBT projects may be of benefit to environmental sustainability within tourism, which includes nature walks, wildlife conservation efforts, and the development of environmentally friendly facilities. These initiatives give the guests true and least intrusive experiences, helping in decreasing the effects of tourism on the environment (Samal & Dash, 2023). These projects help tourists get real village experiences without harming the environment of tourism (Samal & Dash, 2023). Furthermore, CBT creates revenues to support environmental conservation activities, including land and wildlife rehabilitation, tree planting, and protection of threatened species. Being closely connected with travel, CBT reduces the adverse impact of improper mass tourism, for example, contamination and local environment degradation (Elbaz et al., 2023). In this respect, by aligning the supply-side pressures with tourist and community preferences, CBT enhances sustainable tourism enhancement overall. Not only does it conserve resources, but it also makes the visitors or residents' environment friendly, ensuring the sustainability and durability of tourism systems (Abreu et al., 2024). We propose that:

H3. Community-based tourism environmental impacts positively influence sustainable tourist development.

4. The Moderating role of sense of belongings

Social inclusion and acceptance are measured by people's attachment to the group using values, support, and identity (Haim-Litevsky et al., 2023). This sense of belonging is critically necessary for the improvement of the positive effects of CBT on sociocultural, financial, environmental, and sustainable development. Perceived obligation to their town makes locals willing to cooperate, participate actively, and ensure that tourist projects are successful (Mendes et al., 2020). Economically, for example, the feeling of belonging fosters unity and collective responsibility, hence the benefits of tourism (Behr & Nix, 2024). Tightly connected and cooperative communities are going to support local businesses, pool money, and spend it on activities that would be useful for all of them with money spent on travelling. In addition, these communities are more likely to integrate their resources. So, through the harmonisation of sustainable development goals with the said inclusive economic involvement, living circumstances are enhanced and inequality minimised (Quaye et al., 2024).

Chauhan (2022) found that a positive CBT feeling of belonging leads to trust and cooperation, which are crucial in protecting cultural heritage and increasing local pride and thus make CBT rather effective. Residents promote cultural tourism development and are more willing to participate in the decision-making process; thus, they contribute to the preservation of traditions and the development of close-knit relationships with tourists. The feeling of community pride enhances the friendliness of the place, which in turn makes visitors have satisfactory experiences.

Elbaz & Abou-Shouk, in their 2016 study, argue that such individuals are likely to protect natural environments because they define them as part of themselves. Therefore, it is posited that those communities with positive attitudes towards tourism and emotional attachment towards the environment will support sustainable measures such as conservation, waste management, and resource conservation (Sukran et al., 2025; Sholeha & Sumarmi, 2025; Seidualin et al., 2025; Hassan et al., 2024; Rashwan et al., 2024; Ziari & Mosleh, 2025). In general, therefore, a community's sense of belonging plays an important moderate role in the enhancement of the positive effects of CBT. That is why it contributes to building a sustainable model of tourism that is beneficial for both locals and tourists and promotes economic equality, social inclusion, and environmental care for the future. Therefore, we suggest the following hypotheses:

H4: A sense of belonging positively moderates the relationship between community-based tourism's economic impacts and sustainable tourism development.

H5: A sense of belonging positively moderates the relationship between community-based tourism's sociocultural impacts and sustainable tourism development.

H6: A sense of belonging positively moderates the relationship between community-based tourism's environmental impacts and sustainable tourism development.

MATERIALS AND METHODS

1. Participants

In the current study, 183 Omani women selected to explore their views on community-based tourism (CBT) in Oman made up the poll. The participants were selected via convenience sampling, therefore facilitating efficient data gathering over the course of the investigation. Convenience sampling was approved given the exploratory nature of the study and the need to gain understanding from a particular demographic group - Omani women - who significantly participate in community and tourism-related activities in Oman. Enough sample size would ensure the sustainability of data gathering inside the constraints of the research and support major statistical analysis.

2. Data Collection

Data gathering ran from January 21 to the end of February 2024. Two research assistants employed and equipped to help with questionnaire collecting and delivery. The tools of the survey sought to gather data on important factors, including economic elements (ECO), sociocultural components (SCI), environmental concerns (ENV), a sense of belonging (PS), and sustainable tourist development (STD). To gather both quantitative and qualitative information, the poll consisted of closed-ended Likert-scale questions as well as open-ended ones. To guarantee that ethical standards were followed, the participants were given comprehensive knowledge on the goals, methods, and rights related to the study. Before they could start taking part—that is, by responding to the first question they approved to answer, every person had to complete an informed consent form. Throughout the trial, confidentiality and secrecy were respected; information that may be used to identify specific people was not gathered.

3. Procedure

The authors and research assistants distributed the questionnaires to local markets, cultural institutions, university students and community gatherings, among other places, in order to get a diverse sample of Omani women. Participants might decide to bring the survey home and later return it or finish it on-site. This flexibility allowed adequate time for responders to provide thoughtful responses, hence optimising participation rates. The research assistants were ready to respond to any questions or concerns participants raised during the data-gathering process.

4. Measures

Sense of belonging was the first latent variable chosen from Han et al. (2019), therefore guaranteeing a strong theoretical basis for the suggested model. Furthermore, derived from Ko & Stewart (2002), which are extensively acknowledged in tourism sustainability research, were the aspects of tourist effects, economic impacts, sociocultural impacts, and environmental impacts. Furthermore, the adopted variable on sustainable development from Abou-Shouk et al. (2021) captures the present perspective on environmentally friendly travel choices. To investigate these elements, a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree was applied on a standardised questionnaire. Combining these approved principles with a validated survey instrument increases the validity and reliability of the study, therefore ensuring a correct assessment of the linkages among the key components.

RESULTS AND DISCUSSION

1. Data Analysis

The current study employed PLS-SEM, the statistical tool to examine the gathered data in order to probe the relationships between the variables (Elbaz et al., 2022; Ghazi et al., 2024). Descriptive statistics were used to give a brief overview of the demographic traits of the sample together with the distribution of responses. Table 1 shows the respondents' demographic profile (N = 183), therefore exposing several noteworthy trends. In this sense, the age distribution shows that 25.1% of respondents fall between the 26–35 age range, whereas 53% of respondents are between the 18–25 age range.

Table 1. Demographic data (N= 183) (Source: Author's own work)

Item		**Frequencies**	**Percent**
Age	18-25 Years	97	53
	26-35 Years	46	25.1
	36 to 45 Years	35	19.1
	46-55 Years	5	2.7
	More than 55 Years	-	-
Marital status	Single	106	57.9
	Married	77	42.1
Occupation	Student	87	47.5
	Employee	75	41.0
	Other	21	11.5
Benefits from tourism industry	Yes	132	72.1
	No	51	27.9

With no responders beyond 55 years of age, the 36–45 age group represents 19.1%; the 46–55 age group accounts for 2.7%. Of the responders, 42.1% said they were married; 57.9% said they were single. Occupationally, of the respondents, 47.5% are students, 41% are workers, and 11.5% fall into other occupations. While 27.9% of respondents said they had no such benefits from the tourism industry, a vast majority of respondents, 72.1%, said they do. These results provide a complete study of demographic elements together with their correlation with advantages connected to tourism (Figure 2).

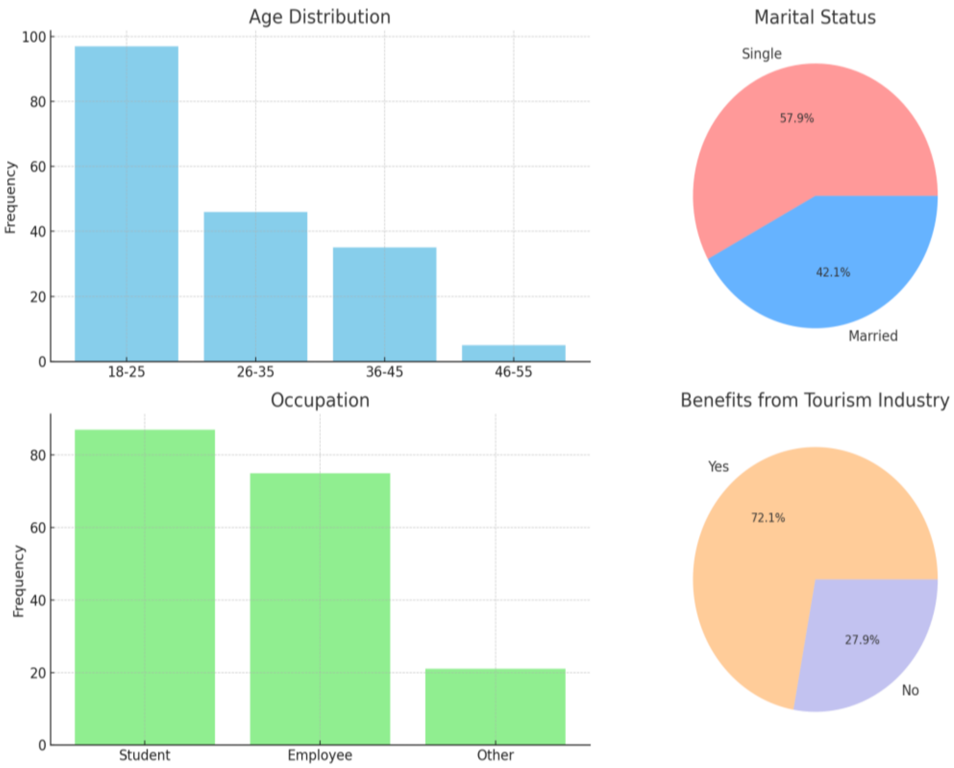

Figure 2. Visual representation of demographic data (Source: Author's own work)

2. Measurement Model

The quality of the measurement model, which evaluates the latent variables used in the study, was assessed through an examination of both validity and reliability. Internal reliability of the constructs was evaluated using composite reliability and Cronbach's alpha (Table 2).

Table 2. Validity and Reliability Statistics (Source: Author's own work)

Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)	Full Collinearity VIFs
ECO	0.736	0.851	0.655	1.802
SCI	0.963	0.976	0.932	6.291
ENV	0.958	0.967	0.855	5.942
STD	0.829	0.898	0.745	1.461
PS	0.972	0.982	0.947	4.991

Validity, on the other hand, was assessed by analyzing the item loadings (Appendix 1) and the Average Variance Extracted (AVE) for convergent validity (Table 2). Discriminant validity was evaluated using the square roots of the AVE values. Additionally, potential co-workers were checked through the Variance Inflation Factor (VIF) for all latent variables (Table 2).The validity and reliability of the constructs were evaluated using Cronbach’s alpha, composite reliability, average variance extracted (AVE), and full collinearity variance inflation factors (VIFs). All latent variables demonstrate satisfactory reliability, with Cronbach’s alpha values exceeding the acceptable threshold of 0.7, ranging from 0.736 (ECO) to 0.972 (PS), and composite reliability values ranging from 0.851 (ECO) to 0.982 (PS). Likewise, convergent validity was validated as the AVE values for all latent variables above the advised threshold of 0.5, with values ranging from 0.655 (ECO) to 0.947 (PS), as well as factor loadings having been satisfied (see Table 3). For several constructions, especially SCI (6.291), ENV (5.942), and PS (4.991), the whole collinearity VIFs suggested possible multicollinearity problems, though, as these values are beyond the generally acknowledged threshold of 3.3. Nevertheless, the results guarantee the robustness of the measurement model by providing substantial proof for the validity and dependability of the latent variables. To solve the noted multicollinearity problems, more study might be needed.

As the table below shows, the Heterotrait-Monotrait ratio (HTMT2) was used to evaluate the construct's discriminant validity. Table 4 shows that the HTMT2 values for most construct pairs are below the advised threshold of 0.85, therefore showing adequate discriminant validity. Some construct pairings, though, especially those involving SCI and ENV as well as SCI and PS, approach or exceed this threshold and call for more thought. Moreover, the table below shows the square roots of the Average Variance Extracted (AVE), thereby evaluating the constructural discriminant validity once more. The square roots of AVE are denoted in parentheses for every construct; these values were then matched against the construct-based correlations (Table 5). If discriminant validity is to be shown, the square root of the AVE for each construct should be larger than the correlations between that construct and every other construct.

Table 3. Factor loading (Source: Author’s own work)

Variable	Item	Loading	Sig.
Economic factors (ECO)	ECO1	(0.826)	0.000
	ECO2	(0.844)	0.000
	ECO3	(0.756)	0.000
Social factor (SCI)	SCI1	(0.960)	0.000
	SCI2	(0.965)	0.000
	SCI3	(0.971)	0.000
Environmental factor (ENV)	ENV1	(0.913)	0.000
	ENV2	(0.919)	0.000
	ENV3	(0.929)	0.000
	ENV4	(0.930)	0.000
	ENV5	(0.931)	0.000
Sense of belonging (PS)	PS1	(0.875)	0.000
	PS2	(0.872)	0.000
	PS3	(0.842)	0.000
Sustainable tourism development (STD)	STD1	(0.972)	0.000
	STD2	(0.979)	0.000
	STD3	(0.968)	0.000

Table 4. Discriminant validity by heterotraitmonotrait (HTMT2) Values (Source: Author’s own work)

Construct	ECO	SCI	ENV	STD	PS
ECO	-				
SCI	0.166				
ENV	0.092	0.907			
STD	0.508	0.045	0.049		
PS	0.106	0.879	0.907	0.039	-

Table 5. Correlations among Latent Variables with Square Roots of AVEs (Source: Author’s own work)

Construct	ECO	SCI	ENV	STD	PS
ECO	(0.810)				
SCI	0.140	(0.965)			
ENV	0.065	0.871	(0.925)		
STD	0.398	0.019	0.008	(0.863)	
PS	0.088	0.850	0.875	0.022	(0.973)

3. The structural model

In our study we examined the direct and moderating factors affecting community-based tourism (CBT) in Oman; the structural model looked at Figure 3. The findings showed that CBT ($\beta = 0.18$, $P < 0.01$) had a notable positive direct effect from economic factors (ECO), meaning that the success of community-based tourism projects is mostly dependent on financial considerations, including income generation, job creation, and economic benefits for local communities. This is consistent with research stressing that local populations must actively support tourist operations by means of economic sustainability, as it immediately guarantees long-term involvement and directly enhances their livelihoods.

Moreover, we found that sociocultural elements (SCI) showed a notable direct influence on CBT ($\beta = 0.15$, $P < 0.01$), thereby underlining the need for social conventions, cultural legacy, and community engagement in forming travel behaviour. Hence, in the context of the sultanate of Oman, where cultural identity and customs are highly prized, community-based tourism is flourishing when it fits local conventions and helps locals to feel pride and ownership. Research shows that effective community-based tourism approaches mostly rely on social cohesiveness, and cultural preservation supports this result. The present research additionally illustrated that CBT ($\beta = 0.19$, $P < 0.01$) had a notable favourable direct effect from environmental influences (ENV). This implied that, to increase community-based tourism, this demonstrates the need to know the surroundings, engage in conservation activities, and handle resources in a way that does not damage them. One prominent example of Oman's environmental preservation—where natural surroundings like deserts, mountains, and coastal areas are significant attractions—will help to retain the attractiveness of tourism sites and guarantee their long-term profitability. This outcome reveals increasing awareness of the reciprocal reliance between environmental sustainability and increasing tourist count. These findings usually indicate how environmental, social, and economic factors taken together define Omani community-based tourism (CBT). Local people travel for financial purposes; sociocultural elements ensure adherence with their values and practices; and environmental issues highlight the importance of using sustainable approaches to preserve natural resources. Oman's strong and inclusive community-based tourism depends on this integrated strategy, as it addresses the related areas of environmental preservation, cultural preservation, and economic growth. Studies of community-based tourism models provide references stressing the need of balancing these three pillars to generate fair and sustainable travel systems.

4. The moderating role of sense of belonging

The findings indicated substantial and intricate impacts of a sense of belonging (PS) on community-based tourism (CBT) in Oman. Initially, PS was identified as a significant negative moderator of the association between sociocultural characteristics (SCI) and sustainable tourist development (STD) ($\beta = -0.14$, $P = 0.03$). Remarkably, this research indicates that in communities with a robust feeling of belonging, the impact of social norms, peer behaviour, or cultural expectations on sustainable tourism practices may lessen. This may be due to the fact that cohesive groups in Oman, with a profound sense of identification and belonging, would choose their traditional beliefs and traditions over external societal pressures.

Consequently, external social forces may exert diminished influence on their acceptance of sustainable tourism projects, since they depend more on internal community cohesiveness and collective ideals. Conversely, PS greatly and favourably moderates the connection between environmental variables (ENV) and STD ($\beta = 0.21$, $P < 0.01$). This suggests that environmental awareness and sustainability commitment of community members are enhanced when they experience a great feeling of belonging. In the sultanate of Oman, where a feeling of community identity and livelihoods depends on natural surroundings like deserts, mountains, and coastal areas, a sense of belonging helps one to develop a closer relationship to the surroundings. This link inspires communities to actively participate in sustainable practices like resource conservation and ecosystem protection in order to maintain their legacy and guarantee the long-term survival of tourism. Not surprisingly, PS ($\beta = 0.09$, $P = 0.11$) had no appreciable effect on the link between economic effects (ECO) and sustainable development (STD). This implies that the influence of economic aspects, like the creation of money or the supply of financial incentives, on the evolution of sustainable tourism that is sustainable does not much depend on a feeling of belonging.

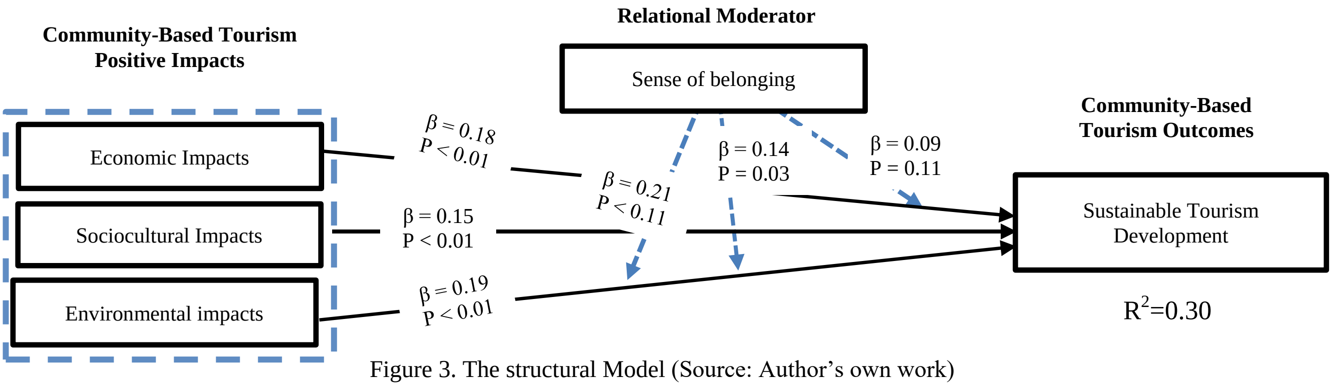

Figure 3. The structural Model (Source: Author's own work)

5. Theoretical implications

The results of the study considerably progress the theoretical knowledge of community-based tourism (CBT) in Oman by defining the complex connections between economic, social, and environmental components as well as the moderating function of a feeling of belonging (PS). First, the study blends social influence theories, including Ajzen's Theory of Planned Behaviour, with environmental psychology to explain how sociocultural aspects (SCI) and environmental variables (ENV) interact with a sense of belonging to effect sustainable tourism development (STD). Particularly in Oman, which is ecologically sensitive and culturally varied, this integration provides a more complete basis for understanding CBT. Hence, the current research stresses the significance of considering both internal community dynamics and exterior impacts in tourism research by connecting two theoretical areas. In addition, by exposing the dual function of a sense of belonging (PS) in modulating relationships inside CBT, the research extends the literature on place attachment and community psychology. PS reduces the impact of outside social conventions even as it enhances the relationship between environmental knowledge and sustainable behaviour. This result fits Stedman's (2002) research on place attachment, which holds that emotional ties to a place can influence activities in ways that give local values first priority over outside demands. This complex knowledge of PS enhances theoretical debates on how the growth of tourism is influenced by community identification and belonging. The fact that PS does not have a strong moderate influence on the link between economic variables (ECO) and STD is a fundamental theoretical insight that may be gleaned from this observation. For the purpose of conclusion, this finding is offered. It argues that economic impulses act as pragmatic concerns rather than being deeply tied to identities and that they operate independently of emotional or cultural attachments at the same time. On the other hand, this stands in opposition to the idea that economic forces are significantly linked to the identity of the community. As a consequence of this research, the argument made by Sharpley (2014), which asserts that financial motivations in tourism typically work as practical requirements, is given more weight than it would have been otherwise. In addition to this, it highlights the need of addressing the economic parts of tourism frameworks in a manner that is distinct from the method in which the sociocultural aspects are treated.

6. Practical implications

This research delivers important practical uses to policymakers and tourist planners as well as community leaders in Oman who aim to develop community-based tourism. Environmental stewardship holds significant importance because its positive moderation effects strengthen the connection between ENV and STD, according to study findings. Strategies need to build community members' bond with nature by delivering educational content and cultural heritage-awareness programs regarding the essential connection between environmental stewardship and cultural heritage. Community involvement represents a crucial element for sustainable practice development, according to Pretty et al. (2009), in order to maintain the permanence of tourism destinations. The relationship between SCI and STD receives opposition from PS, which indicates external social norms struggle to affect communities that maintain close social bonds. Tourism planners need to work together with local leaders and influencers to develop sustainable practices that both preserve traditional community values and promote tourism. The approach adheres to Murphy’s (1985) recommendations about community-led tourism planning because it requires local participation and cultural sensitivity to make tourism initiatives successful.

Third, the absence of PS moderation indicates that financial incentives should be created to satisfy practical needs independently from emotional or cultural ties despite their importance in CBT. Tourism development through microfinance options and training programs and infrastructure improvements enables local communities to participate in tourism activities alongside economic sustainability objectives. Economic empowerment stands as an essential factor according to Scheyvens’ (1999) research in community-based tourism because it provides sustainable benefits needed to maintain local participation. The implementation of participatory planning alongside co-management programs for tourism resources creates the best conditions for enhancing PS and promoting community ownership. Every community member becomes more dedicated to sustainable practices when they participate in tourism management decisions through local ownership schemes. Research by Tosun (2000) demonstrates that participatory approaches represent a key factor for attaining sustainable tourism development. Communities involved in tourism planning and implementation help stakeholders create initiatives that suit cultural norms while preserving economic stability and environmental sustainability.

7. Limitations and further research

The new research provides important insights about CBT elements in Oman while analysing sustainable development for Omani women but faces certain boundaries. The geographic focus on Oman in this study hinders broader result generalisation to different regions or cultural environments. The distinctive social and environmental aspects, along with the strong community values of Oman, limit how well its CBT dynamics represent international tourism dynamics. Additional research should analyse different geographic areas because this expansion would boost the general applicability of the research outcomes. The research applies quantitative analytical methods to explore how environmental factors relate to social aspects and financial elements in sustainable tourist development (STD). Although providing statistical precision, this method might not demonstrate the full spectrum of community understandings and experiences of the topic. Local populations involved in CBT benefit from qualitative approaches through interviews and focus groups because these methods deliver deeper understanding of their motivations and goals and their identified problems. The study points out PS as a moderating variable but omits the investigation of alternative possible mediators or moderators affecting the analyzed connections. The results of CBT assessments heavily depend on government institutions together with resource availability and community empowerment levels. Future research should incorporate additional elements to develop better knowledge of both supportive and obstructive factors that affect sustainable tourism development. A study design that uses a cross-sectional approach restricts researchers from showing the relationship between variables that lead to cause and effect. Research built on longitudinal methodologies tracking community changes in attitudes and behaviors alongside tourism effects through time would enhance the understanding of CBT program benefits while proving causality. Self-reported data dependence generates biases within studies since participants tend to report responses that match their desired public image instead of genuine thoughts.

CONCLUSION

Community-based tourism stands as a fundamental mechanism for sustainable development because positive transformation occurs mainly through economic growth and environmental management. The research confirms the need for economic and environmental approaches as fundamental elements to boost sustainability initiatives in local communities, even though sociocultural aspects bind less strongly to the results. Women's sense of belonging modifies the positive effects of these factors to benefit sustainable tourism practices.

Policymakers and stakeholders should develop inclusive tourism strategies that build women's engagement and community social bonds to address these findings. Additional studies should expand their focus on the long-term effects of these relationships while studying other cultural factors that guide community-based tourism development.

Author Contributions: Conceptualization, O.D. and A.M.E.; methodology, O.D. and L.E.; software, R.I. and M.I.; validation, O.D. and A.M.E. and L.E.; formal analysis, O.D. and YA.M.E.; investigation, L.E. and R.I. and M.I.; data curation, O.D. and A.M.E.; writing - original draft preparation, A.M.E and O.D.; writing - review and editing, O.D. and L.E. and A.M.E. and M.I.; visualization, O.D. and A.M.E. and R.I. and L.E. and M.I.; supervision, O.D. and A.M.E.; project administration, O.D. and A.M.E. All authors have read and agreed to the published version of the manuscript.

Funding: This work was funded by the research council, Ministry of Higher Education, Research and Innovation, Oman.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Abou-Shouk, M. A., Mannaa, M. T., & Elbaz, A. M. (2021). Women's empowerment and tourism development: A cross-country study. *Tourism management perspectives*, *37*, (2021), 100782. https://doi.org/10.1016/j.tmp.2020.100782

Abreu, L. A. D., Walkowski, M. D. C., Perinotto, A. R. C., & Fonseca, J. F. D. (2024). Community-Based Tourism and Best Practices with the Sustainable Development Goals. *Administrative Sciences*, 14(2), 36. https://doi.org/10.3390/admsci14020036

Bagus, S. I., Imade, S. U., Nyoman, S. I. A., & Putu, W. S. N. (2019). Community based tourism as sustainable tourism support. *Russian Journal of Agricultural and Socio-Economic Sciences*, *94*(10), 70-78. https://doi.org/10.18551/rjoas.2019-10.09

Behr, M. M., & Nix, T. K. M. (2024). Exploring Sense of Place Through Local Tourism Actors' Embeddedness in Rural Tourism Place-Making: Insights from Local Rural Tourism Actors in Southern Sweden (Dissertation). Accessed on [23/11/2024]. https://urn.kb.se/resolve?urn=urn: nbn:se:lnu:diva-131326

Chauhan, E. (2022). Residents' motivations to participate in decision-making for cultural heritage tourism: Case study of New Delhi. *Sustainability*, *14*(14), 8406. https://doi.org/10.3390/su14148406

Dangi, T. B., & Jamal, T. (2016). An integrated approach to "Sustainable community-based tourism". *Sustainability*, *8*(5), 475. https://doi.org/10.3390/su8050475

Dobre, R. I., Lixandrescu, G., & Cazacu, C. (2025). Evaluation and valorization of geomorphosites in sustainable tourism activities, Făgăraș Massif (Southern Carpathians, România). *GeoJournal of Tourism and Geosites*, *58*(1), 354-363. https://doi.org/10.30892/gtg.58132-1417

Elbaz, A. (2013). Actor-network theory, tourism organizations and the development of sustainable community livelihoods. *Unpublished PhD thesis submitted to the Plymouth University, UK*.

Elbaz, A. M., & Abou-Shouk, M. A. (2016). The role of tourism-related organisation networks in developing sustainable community livelihoods. *Journal of Basic and Environmental Sciences*, *3*(2016), 112-122. 10.21608/jbes.2016.369619

Elbaz, A. M., Salem, I. E., Al-alawi, A., Alkathiri, N. A., & Ramkissoon, H. (2023). Tourist behaviour and poverty reduction. In *Handbook on Tourism and Behaviour Change* (pp. 235-249). Edward Elgar Publishing. https://doi.org/10.4337/9781800372498.00024

Elbaz, A. M., Salem, I. E., Onjewu, A. K., & Shaaban, M. N. (2022). Hearing employee voice and handling grievance: Views from frontline hotel and travel agency employees. *International Journal of Hospitality Management*, 107, 103311. https://doi.org/10.1016/j.ijhm.2022.103311

Giampiccoli, A., & Saayman, M. (2018). Community-based tourism development model and community participation. *African Journal of Hospitality, Tourism and Leisure*, *7*(4), 1-27. Accessed on [30/12/2024]. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/ https://www.ajhtl.com/uploads/7/1/6/3/7163688/article_16_vol_7_4__2018.pdf

Ghosh, P., Jha, S. S., & Bowal, S. (2025). Heritage value dimensions and tourist intention towards sustainable heritage conservation: A mediating role of destination attachment. *GeoJournal of Tourism and Geosites*, *58*(1), 296-305. https://doi.org/10.30892/gtg.58126-1411

Shekhar, C. (2024). Sustainable Tourism Development: Balancing Economic Growth and Environmental Conservation. *Migration Letters*, *21*(S7), 1240-1253. http://dx.doi.org/10.2139/ssrn.4901174

Haim-Litevsky, D., Komemi, R., & Lipskaya-Velikovsky, L. (2023). Sense of belonging, meaningful daily life participation, and well-being: Integrated investigation. *International journal of environmental research and public health*, *20*(5), 4121. https://doi.org/10.3390/ijerph20054121

Han, H., Eom, T., Al-Ansi, A., Ryu, H. B., & Kim, W. (2019). Community-based tourism as a sustainable direction in destination development: An empirical examination of visitor behaviors. *Sustainability*, *11*(10), 2864. https://doi.org/10.3390/su11102864

Hariyadi, B. R., Rokhman, A., Rosyadi, S., Yamin, M., & Runtiko, A. G. (2024). The Role of Community-Based Tourism in Sustainable Tourism Village in Indonesia. *Revista de Gestão Social e Ambiental*, *18*(7), e05466-e05466. https://doi.org/10.24857/rgsa.v18n7-038

Hassan, T. H., Fazia, C., Abdelmoaty, M. A., Bekzot, J., Gozner, M., Almakhayitah, M. Y., & Salem, A. E. (2024). Sustainable pathways: understanding the interplay of environmental behavior, personal values, and tourist outcomes in farm tourism. *Discover Sustainability*, *5*(1), 153. https://doi.org/10.1007/s43621-024-00354-8

Juma, L. O., & Khademi-Vidra, A. (2019). Community-based tourism and sustainable development of rural regions in Kenya; Perceptions of the citizenry. *Sustainability*, *11*(17), 4733. https://doi.org/10.3390/su11174733

Ghazi, K. M., Salem, I. E., Dar, H., & Elbaz, A. M. (2024). Leveraging strategic leadership for boosting operational resilience in hotels: the role of crisis response strategies and e-readiness. *International Journal of Contemporary Hospitality Management*, *36*(10), 3300-3323. https://doi.org/10.1108/IJCHM-05-2023-0650

Khizar, H. M. U., Younas, A., Kumar, S., Akbar, A., & Poulova, P. (2023). The progression of sustainable development goals in tourism: A systematic literature review of past achievements and future promises. *Journal of Innovation & Knowledge*, *8*(4), 100442. https://doi.org/10.1016/j.jik.2023.100442

Ko, D. W., & Stewart, W. P. (2002). A structural equation model of residents' attitudes for tourism development. *Tourism management*, *23*(5), 521-530. https://doi.org/10.1016/S0261-5177(02)00006-7

Kumar, J., & Nayak, J. K. (2019). Exploring destination psychological ownership among tourists: Antecedents and outcomes. *Journal of Hospitality and Tourism Management*, *39*, 30-39. https://doi.org/10.1016/j.jhtm.2019.01.006

Kunjuraman, V. (2023). A revised sustainable livelihood framework for community-based tourism projects in developing countries. Current Issues in Tourism, 26(4), 540-546. https://doi.org/10.1080/13683500.2022.211656

Lee, T. H., & Jan, F. H. (2019). Can community-based tourism contribute to sustainable development? Evidence from residents' perceptions of the sustainability. *Tourism Management*, *70*, 368-380. https://doi.org/10.1016/j.tourman.2018.09.003

Lo, Y. C., & Janta, P. (2020). Resident's perspective on developing community-based tourism–a qualitative study of Muen Ngoen Kong Community, Chiang Mai, Thailand. *Frontiers in Psychology*, *11*, 1493. https://doi.org/10.3389/fpsyg.2020.01493

Mendes, B. D. C., Cavenaghi, A. J., & Wada, E. K. (2020). Sense of belonging and the appropriation of a touristic city by local students (Brazil). *Journal of Teaching in Travel & Tourism*, *20*(1), 41-58. https://doi.org/10.1080/15313220.2019.1622481

Mia, M. N., Mani, L., Rahman, M. M., Milon, M. N. U., & Hossain, R. (2024). Gravitating towards Community Based Tourism (CBT): Community Empowerment and Reducing Poverty in Tourism Sector Development in Bangladesh. *International Journal of Religion*, *5*(6), 848-864. https://doi.org/10.61707/e1zchv24

Mokabe, M., Setokoe, T. J. & Ramukumba, T. (2024). The Leadership Role in Sustainable Community-Based Tourism Development Within a Rural Setting. African Journal of Hospitality, Tourism and Leisure, 13(2):342-350. https://doi.org/10.46222/ajhtl.19770720.515

Murphy, P. E. (1985). *Tourism: A Community Approach*. Routledge.

Natarajan, N., Newsham, A., Rigg, J., & Suhardiman, D. (2022). A sustainable livelihoods framework for the 21st century. *World Development*, *155*, 105898. https://doi.org/10.1016/j.worlddev.2022.105898

Ngo, T. H., & Creutz, S. (2022). Assessing the sustainability of community-based tourism: a case study in rural areas of Hoi An, Vietnam. *Cogent Social Sciences*, *8*(1), 2116812. https://doi.org/10.1080/23311886.2022.2116812

Ngo, T. H., Tournois, N., Dinh, T. L. T., Chu, M. T., & Phan, C. S. (2024). Sustainable Community-Based Tourism Development: Capacity Building for Community; The Case Study in Cam Kim, Hoi An, Vietnam. *Journal of Sustainability Research*, *6*. https://doi.org/10.20900/jsr20240022

Okazaki, E. (2008). A community-based tourism model: Its conception and use. *Journal of sustainable tourism*, *16*(5), 511-529. http://dx.doi.org/10.1080/09669580802159594

Okpa, U. J., Okoro, L. A., Arrey, M. E. V., Mbum, P. A., Umo, U. A., Inah, G. M., & Iwara, E. E. (2025). Role of social media as a catalyst for sustainable tourism development in Calabar Metropolis, Nigeria. *Geojournal of Tourism and Geosites*, *58*(1), 412-421. https://doi.org/10.30892/gtg.58138-1423

Pretty, J., Adams, B., Berkes, F., de Athayde, S., Dudley, N., Hunn, E., & Pilgrim, S. (2009). The intersections of biological diversity and cultural diversity: Towards integration. *Conservation and Society*, 7(2), 100-112. https://doi.org/10.4103/0972-4923.58642

Quaye, J. N. A., Halsall, J. P., Winful, E. C., Snowden, M., Opuni, F. F., Hyams-Ssekasi, D., & Fairhurst, B. (2024). Social enterprises and the Sustainable Development Goals (SDGs): a means to an end. *Environment, Development and Sustainability*, 1-30. https://doi.org/10.1007/s10668-024-05359-x

Rashwan, K. A., Mathew, V., Akef, R., & Elbaz, A. M. (2024). bridging empowerment and entrepreneurship: how NGOS foster women's success in Egypt's tourism industry. *Geojournal of Tourism and Geosites*, *57*, 1991-1998. https://doi.org/10.30892/gtg.574spl13-1366

Samal, R., & Dash, M. (2023). Ecotourism, biodiversity conservation and livelihoods: Understanding the convergence and divergence. *International Journal of Geoheritage and Parks*, *11*(1), 1-20. https://doi.org/10.1016/j.ijgeop.2022.11.001

Sapkota, K. P., Palamanit, A., Techato, K., Gyawali, S., Ghimire, H. P., & Khatiwada, B. (2024). The Role of Local Community in Enhancing Sustainable Community Based Tourism. *Journal of Electrical Systems*, *20*(7s), 558-571. https://doi.org/10.52783/jes.3360

Scheyvens, R. (1999). Ecotourism and the empowerment of local communities. *Tourism Management*, 20(2), 245-249. https://doi.org/10.1016/S0261-5177(98)00069-7

Seidualin, D., Mussina, K., & Mukanov, A. (2025). Leveraging territorial branding for sustainable development and tourist attraction: Case of Ulytau, Kazakhstan. *Geojournal of Tourism and Geosites*, *58*(1), 61-77. https://doi.org/10.30892/gtg.58106-1391

Sharpley, R. (2014). Host perceptions of tourism: A review of the research. *Tourism Management*, 42, 37-49. https://doi.org/10.1016/j.tourman.2013.10.007

Sholeha, A. W., & Sumarmi, S. (2025). Managing sustainable tourism of perawan beach, east Java, Indonesia based on the coastal ecosystem service (ces) approach. *GeoJournal of Tourism and Geosites*, *58*(1), 78-88. https://doi.org/10.30892/gtg.58107-1392

Stedman, R. C. (2002). Toward a social psychology of place: Predicting behavior from place-based cognitions, attitude, and identity. *Environment and Behavior*, 34(5), 561-581. https://doi.org/10.1177/0013916502034005001

Sukran, M. A., Kurniawan, T., Basri, H., & Furqan, A. (2025). Exploring marine tourism on sustainable development segment in Indonesia: SPAR-4-SLR. *GeoJournal of Tourism and Geosites*, *58*(1), 243-256. https://doi.org/10.30892/gtg.58121-1406

Tosun, C. (2000). Limits to community participation in the tourism development process in developing countries. *Tourism Management*, 21(6), 613-633. https://doi.org/10.1016/S0261-5177(00)00009-1

Vu, D. V., Tran, G. N., Nguyen, H. T. T., & Nguyen, C. V. (2020). Factors affecting sustainable tourism development in Ba Ria-Vung tau, Vietnam. *The Journal of Asian Finance, Economics and Business*, *7*(9), 561-572. https://doi.org/10.13106/jafeb.2020.vol7.no9.561

Wani, M. D., Batool, N., Dada, Z. A., & Shah, S. A. (2024). Investigating the impact of community-based tourism on the residents' quality of life and their support for tourism. *Community Development*, *55*(1), 138-159. https://doi.org/10.1080/15575330.2023.2272271

Zamzami, L., Hasmira, M. H., Harahap, J., & Aliman, M. (2025). Empowering of coastal community ecotourism: The role of cultural entrepreneurship among fishermen in west Sumatra Indonesia. *Geojournal of Tourism and Geosites*, *58*(1), 396-404. https://doi.org/10.30892/gtg.58136-1421

Ziari, K., & Mosleh, L. (2025). Enhancing environmental sustainability through the sustainable urban tourism: Case study of Northern Tehran, Iran. *Geojournal of Tourism and Geosites*, *58*(1), 492-500. https://doi.org/10.30892/gtg.58146-1431

Zielinski, S., Kim, S. I., Botero, C., & Yanes, A. (2020). Factors that facilitate and inhibit community-based tourism initiatives in developing countries. *Current Issues in Tourism*, *23*(6), 723-739. https://doi.org/10.1080/13683500.2018.1543254

Article history: Received: 20.02.2025 Revised: 20.05.2025 Accepted: 11.06.2025 Available online: 30.06.2025

Year XVIII, vol. 60, no. 2spl, 2025, p.1231-1242
DOI 10.30892/gtg.602spl20-1496

ASSESSING THE SOCIO-ECOLOGICAL FEASIBILITY OF DAM CONSTRUCTION PROJECTS ON CRITICAL LANDS: A STUDY ON THE ANALYSIS OF THE BENEFITS AND DESIGN CONCEPT OF RIVERSCAPE AS A TOURIST DESTINATION

Ramli AKHMAD [1*], SUMARMI [1], I Komang ASTINA [1], Satti WAGISTINA [1], Hasan BASRI [2]

[1] Universitas Negeri Malang, Faculty of Social Science, Department of Geography, Malang, Indonesia; ramli.ak@hamzanwadi.ac.id (R.A.); sumarmi.fis@um.ac.id (S.); komang.astina.fis@um.ac.id (I.K.A.); satti.wagistina.fis@um.ac.id (S.W.)
[2] Universitas Hamzanwadi, Faculty of Language, Arts and Humanities, Department of Tourism, East Lombok, Indonesia; hasanbasri@hamzanwadi.ac.id (H.B.)

Citation: Akhmad, R., Sumarmi., Astina, I.K., Wagistina, S., & Basri, H. (2025). Assessing the socio-ecological feasibility of dam construction projects on critical lands: A study on the analysis of the benefits and design concept of riverscape as a tourist destination. *Geojournal of Tourism and Geosites*, 60(2spl), 1231–1242. https://doi.org/10.30892/gtg.602spl20-1496

Abstract: The construction of dams on critical lands presents a strategic solution to water scarcity, agricultural degradation, and land productivity decline. However, such infrastructure projects often trigger adverse socio-ecological impacts, including forced displacement, cultural disruption, and ecosystem imbalances. In response, there is growing interest in integrating riverscape-based tourism concepts into dam projects to enhance environmental sustainability and community welfare. This study aims to assess the socio-ecological feasibility of developing riverscape tourism in the context of dam construction, focusing on the Mujur Dam project in Central Lombok, Indonesia—a region affected by drought and land degradation. The research adopts a qualitative case study approach, employing data collection methods such as in-depth interviews, focus group discussions (FGDs), document analysis, and participatory field observations. Informants include residents, farmers, policymakers, tourism actors, indigenous leaders, environmentalists, and project planners. The results reveal that riverscape-based landscape design fosters multifunctional land use, promotes local economic activities, and restores riparian ecosystems. It also facilitates inclusive public spaces, cultural preservation, and environmental education, crucial for sustainable tourism and disaster resilience. Moreover, integrating tourism elements into dam planning encourages participatory governance and strengthens social cohesion. The study highlights the importance of aligning infrastructure development with ecological sensitivity and local aspirations. Findings provide a framework for combining dam engineering, eco-tourism, and landscape design into a unified socio-ecological model. This research also provides practical implications for decision-makers, emphasizing that riverscape tourism can be a bridging concept to harmonize environmental, social, and economic goals. Future research should explore the longitudinal impacts of riverscape tourism on community resilience and biodiversity conservation. Such inquiry is essential to determine whether the observed socio-ecological benefits are sustainable and adaptable to changing environmental and social conditions. Comparative studies across different dam regions could further validate the transferability of this model. Understanding its scalability and context-specific outcomes would inform the development of flexible frameworks suitable for diverse ecological and cultural settings. Additionally, more empirical work is needed to sustain future integrated dam-tourism projects.

Keywords: tourist destinations, riverscape design, dam construction, critical land, socio-ecology

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INTRODUCTION

The water crisis is worsening in many parts of Indonesia, especially in areas prone to drought and agricultural land becoming unproductive. Coupled with anthropogenic pressures, increased pressure on water resources due to climate change, and land-use change have made water resource management difficult (Isukuru et al., 2024; Jahura et al., 2024; Kanownik et al., 2024; Madomguia et al., 2025; Snizhko et al., 2024). Certain areas with low rainfall intensity or uneven water distribution patterns face an increasing risk of water scarcity, ecosystem degradation, and social conflicts in water use (Naderi et al., 2024; Tan et al., 2024). Especially in areas that experience water deficits, such as the southern part of Lombok Island, water resources managers [Inf.3], when interviewed, revealed that on Lombok Island, the annual rainfall is limited to only around 1,087 mm (02/11/2022). As a result, critical land in this region needs quick and appropriate solutions to overcome serious threats to food security and the social life of the community (Fanta et al., 2024).

The government's efforts to build water infrastructure, such as the Mujur Dam in Central Lombok Regency, are one of the strategic options to overcome the water deficit. In addition, the construction of this dam is also targeted to provide raw water sources for developing areas, including the Mandalika Special Economic Zone, in order to support socio-ecological sustainability at the local and national levels (Bustami et al., 2023). In various countries, research on the socio-ecological feasibility of dam construction projects highlights the importance of a thorough analysis of social and ecological impacts. Studies in Zimbabwe show that small dams provide irrigation benefits but also trigger declining fish populations and land-use conflicts (Gwazani et al., 2012). In Thailand, the social impacts of small dams are uneven, including reduced fish populations

* Corresponding author

and flood mitigation benefits (Fung et al., 2019). In addition, the design of river border landscapes as tourist destinations has also been applied to improve environmental quality and community welfare, such as riverbank restoration in Xining, China, which improves the city-river system (Shang, 2018). Including in France, where landscape transformation due to dam removal encourages stakeholder engagement (Germaine & Gonin, 2024). Despite numerous studies on dam construction, in-depth studies related to the socio-ecological feasibility, especially on critical lands, are still rare. Previous research has focused more on technical aspects, such as hydrological design and water use optimization, without exploring the balance between the needs of local communities, creative economy development, and tourism. This research offers innovations in the form of benefit analysis and design concepts of river border landscapes as tourist destinations, which provide policy recommendations for local governments to build water-based tourism. This study answers three main questions, namely: [RQ1] How does the concept of river border landscape support dam tourism? [RQ2] What are the socio-ecological benefits? and [RQ3] How does tourism development improve the sustainability of unproductive land? This study contributes to providing a new perspective on water resources management that focuses not only on technical aspects but also on socio-ecological integration and tourism. Its goal is to be a conceptual design model for similar infrastructure projects in other regions experiencing water deficits.

LITERATURE REVIEW

Socio-ecological feasibility of dam projects

Socio-ecological feasibility refers to the evaluation of the sustainability of a project based on the integration of social and ecological aspects. Studies on this feasibility are often used to assess impacts on local communities and ecosystems (Ujuagu et al., 2025). According to Tan et al., (2024), an effective socio-ecological system requires a balance between human needs and environmental conservation. In many countries, the development of large infrastructure such as dams indicates the need to consider social dimensions, such as community relocation and ecological dimensions. These include changes in river flow patterns and their impact on biodiversity (Burrier & Hultquist, 2019). In the Indonesian context, the integration of socio-ecological aspects is a challenge due to cultural diversity, traditional land tenure systems, and conflicts of interest between stakeholders (Kusters, 2015).

The urgency of dam construction in overcoming the water deficit

Dam construction projects are a strategic solution to overcome water deficits, improve irrigation, and support energy needs in many countries. However, the impact is often controversial. For example, in India, the Narmada Dam project succeeded in increasing agricultural productivity but also led to social conflicts related to evictions (Molden et al., 2010; Seijger et al., 2025). In Indonesia, the construction of large dams, such as the Jatigede Dam in West Java, shows the importance of a multidisciplinary approach, including social impact management and environmental protection (Amalia & Malihah, 2016). In the context of Lombok Island, the main challenge is to ensure equitable water distribution in downstream areas that often lack water, as well as to manage community protests due to environmental and social changes (Prasetyo, 2022; Akhmad et al., 2025)

Critical land of west nusa tenggara and other provinces in Indonesia

Critical lands in Indonesia, such as dry and less fertile areas, have great potential to be developed into strategic projects, including dam construction. According to BPS-Statistics Indonesia Data (Machdi et al., 2024), around 14% of Indonesian land is classified as critical, especially in eastern regions such as Nusa Tenggara.

Table 1. The province with the largest critical land area in Indonesia (Source: Indonesia's critical land (Machdi et al., 2024)

No	Province	Critical Land (ha)	Very Critical	Total
1	West Java	397.516	432.040	829.556
2	Central Kalimantan	734.524	85.159	819.682
3	North Sumatra	486.713	291.229	777.942
4	West Kalimantan	735.421	8.363	743.784
5	South Sumatra	509.126	198.043	707.169
6	West Sumatra	371.489	314.601	686.091
7	East Nusa Tenggara	471.395	109.336	580.731
8	West Nusa Tenggara	324.783	165.531	490.314
9	Maluku	260.013	227.235	487.248
10	North Maluku	83.607	399.660	483.268

From Table 1, the latest data from BPS-Statistics Indonesia Data (Machdi et al., 2024) shows that there are around 10 out of 38 provinces with the largest total critical land in Indonesia. These ten provinces include West Java (829.556 ha), Central Kalimantan (819,682 ha), and North Sumatra (777.942 ha). West Java, despite being one of the most populous provinces, has great challenges in managing critical land, especially in a very critical area of 432.040 ha. Central Kalimantan and West Kalimantan also have a total of 819,682 ha and 743.784 ha of critical land, respectively, with most of the land being degraded due to deforestation and unsustainable agricultural activities.

In the Sumatra region, North Sumatra (777.942 ha), South Sumatra (707.169 ha), and West Sumatra (686.091 ha) face similar challenges, with a combination of high critical and highly critical land, resulting in a decrease in soil fertility and agricultural productivity. Eastern Indonesia, such as East Nusa Tenggara (580.731 ha), West Nusa Tenggara (490.314 ha), Maluku (487.248 ha), and North Maluku (483.268 ha), also showed significant numbers for critical land. West Nusa Tenggara, for example, has 324.783 ha of critical land and 165.531 ha of critically ill land, most of which are in hilly topographic areas with limited water access.According to Lv et al., (2023), critical land use requires an ecologically based approach and community participation to ensure long-term sustainability. Studies show that careful planning in maximizing the potential of critical land can provide economic benefits while minimizing environmental impacts (Alyani et al., 2024). To address these challenges, an integrative strategy that combines critical land rehabilitation, ecological design, and community-based economic development is urgently needed.

Analysis of the function and design of tourism concept

Function analysis is often used in infrastructure planning to evaluate the contribution of each element in supporting project objectives. In dam construction, functional analysis helps ensure that benefits such as raw water supply, irrigation, and electrical energy can be effectively achieved (Munyai et al., 2024; Park & Kim, 2014). In addition, the concept of tourism design is increasingly involved in increasing the added value of the project through the development of dam-based tourist areas. For example, the Jatiluhur Dam project in West Java, which successfully combines infrastructure functions with tourism, has resulted in a significant contribution to the local economy (Wulandari et al., 2021). For river border areas, a sustainability-based design approach involving local communities can provide long-term benefits (Lara-Valencia et al., 2023).

River landscape (riverscape) in the dam area

Riverscape, or river boundary view, refers to the transition area between the land and aquatic ecosystems that have important ecological, social, and economic functions of a dam (Dunham et al., 2018). The management of river boundary areas plays an important role in supporting the ecological functions of dams, including water quality management, erosion control, and natural habitat conservation (Bian et al., 2024; Lisetskii & Buryak, 2023). Studies show that effective management in this area can reduce sedimentation, improve water quality, and increase biodiversity around dams (Chukwuka et al., 2023). However, in Indonesia, river border areas are often not managed optimally, triggering environmental degradation and reducing their ecological benefits (Khairina et al., 2020).

RESEARCH METHODS

This study adopts a qualitative approach with a case study design to evaluate the socio-ecological viability of dam construction on essential land (Emmanuel et al., 2020; Creswell, 2018). Data were collected through field observations, in-depth interviews, document analysis, and focus group discussions (Akyıldız & Ahmed, 2021). The lead author directly participated as part of the environmental social survey team involved in the Mujur Dam pre-construction phase, contributing to data collection on environmental and social aspects, also aligned with the author's dissertation.

Observations focused on the physical and ecological characteristics of the dam site, including soil, vegetation, and hydrological conditions. Interviews were conducted with key stakeholders - affected communities, planners, and ecologists—to explore perspectives and concerns. The document analysis encompasses thorough design studies, project planning documents, and water governance policies. Certain data, represented as maps derived from Landsat imagery and geographic information systems, were obtained from the regional planning report with authorization from the consultant - PT. Massuka Pratama. FGDs captured community needs and aspirations for ecological tourism design in the riparian buffer zones.

Participants were purposively selected based on relevance to the study, including indigenous leaders and technical experts (Table 2 for detailed participants). Data were analyzed thematically to identify patterns related to social-ecological dynamics and tourism design (Gates et al., 2023; Johnson et al., 2022). Methodological triangulation and researcher reflection were employed to ensure data credibility and reduce bias (Donkoh, 2023). The findings support recommendations for sustainable, community-based tourism development in the dam border region, contributing both practically and theoretically to water resource planning and inclusive infrastructure development (Woldu, 2018).

Table 2. Informant categories and data obtained (Source: survey results, 2023)

Informant code	Position/ Profession	Number of participants	Field	Data obtained
Inf.1	Affected communities	15	Socio-economic	Perception of the impact of dam construction, community needs, and aspirations related to ecotourism design.
Inf.2	Project planner	3	Tourism development	Technical plans for tourism development, dam design, and potential tourism impacts.
Inf.3	Water resource managers	2	Water management	Water management policies, river discharge data, and dam water distribution plans.
Inf.4	Ecologist	2	Ecological tourism	Analysis of border Riverscape ecosystems, biodiversity, and potential environmental impacts.
Inf.5	Traditional leaders and local leaders	4	Culture and Social	Local wisdom in the management of resources, community traditions, and cultural values that need to be maintained.
Inf.6	Academy	3	Geography and Social Education	Academic perspectives related to ecotourism site design and socio-ecological integration of the project.

RESULT

Administrative and land characteristics of the dam project location

This research was carried out around the border area of the Mujur Watershed which is the location of the Mujur Dam project. Administratively, the Mujur dam project is located between Prako Village and Lelong Village, Janepria District, Central Lombok Regency-West Nusa Tenggara Province. This area is in strategic coordinates in the central part of Lombok Island, with quite good accessibility from the sub-district city and the district capital. The Mujur Dam project is part of the strategic project for the arrangement of the Eastern Indonesia region, which is handled directly by the Nusa Tenggara I River Regional Center, based on the Regulation of the Minister of Public Works and Public Housing No. 04/PRT/M/2015 concerning the determination of the governance status of the river area.

The catchment area that supports this dam has diverse land use characteristics. Land cover conditions in this area are dominated by critical land, shrubs, and a small number of rainfed rice fields that depend on seasonal rainfall. In addition, there is the potential for land cover in the form of mixed garden areas managed by local communities for palm oil and tobacco crops. Table 3 presents further information about the distribution of land use in the catchment area.

Table 3. Land use in catchment areas supporting the Mujur Dam project (Source: Landscape image analysis, 2021)

Land use	**Areas (Km^2)**	**Percentage (%)**
Forest	13.85	17.91
Garden	27.94	36.13
Settlement	13.86	17.92
Rice Fields	13.09	16.93
Fields	8.6	11.12
Total	77	100

Based on Table 3, it shows that the land use pattern reflects the balance between agrarian activities, environmental protection, and the need for space for settlements. Structuring and managing dominant land uses, such as plantations, forests, and settlements, is essential to ensure the sustainability of the hydrological function of dams and minimize potential negative impacts such as erosion, sedimentation, and uncontrolled land conversion. An analysis of land use reveals that plantations dominate the catchment area, with a coverage of approximately 27 km².

The coverage of all land use from the catchment area is presented in Figure 1. This presents the spatial distribution of land use in the Mujur watershed catchment area, expressed in square kilometres (km²). Garden land constitutes the dominant land use type, accounting for approximately 27.94 km² or 36% of the total catchment area. Forest land occupies an area of approximately 13.85 km², contributing around 18% to the total water catchment area. Similarly, settlement areas cover about 13.86 km², nearly equivalent to the forest land.

Meanwhile, rice fields and dryland farms (fields) span approximately 13.09 km² and 8.6 km², respectively. Overall, the total area of the water catchment region amounts to 77 km².

Figure 1. Distribution of Land Use in the Mujur Catchment Area (Source: Landscape Image Analysis, 2023)

In terms of soil characteristics, the area is predominantly composed of sandy clay textured soils, with relatively poor drainage conditions in several locations, rendering it susceptible to erosion. Geologically, the region is dominated by old volcanic rock formations with thin surface soil layers, posing significant challenges for water retention and vegetation growth. The topography ranges from flat to gently sloping, with gradients between 0–15%, offering opportunities for the development of ecotourism sites and dryland agriculture initiatives.

Social characteristics of communities at the dam project site

Based on survey and mapping results, three sub-districts are located in close proximity to the projected inundation area, namely Central Praya, East Praya, and Janapria. The population affected by the dam construction is primarily concentrated in these three sub-districts. According to the recapitulated statistical data, both the total population and the population density of each village within these sub-districts have been identified and analyzed. The spatial distribution of population density in the villages surrounding the dam site is illustrated in Figure 2.

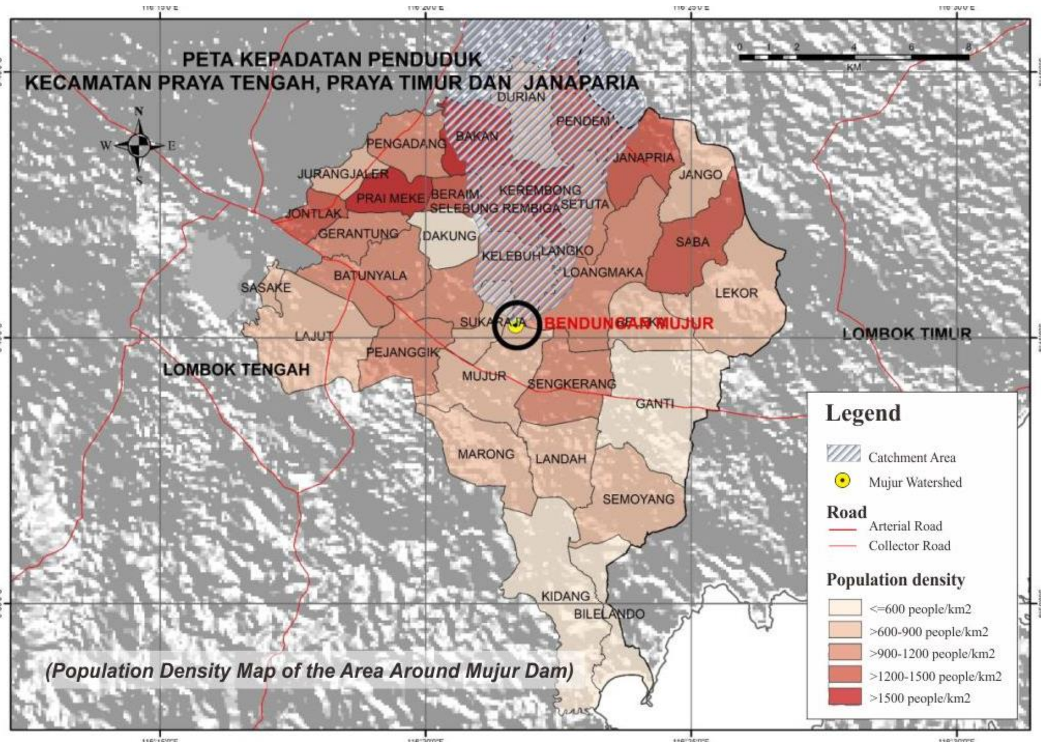

Figure 2. Map of population density levels around the dam (Source: BPS Data Processing, 2024)

In terms of population, the villages around the study site have populations that mostly work as farmers and farm laborers, with income levels dependent on the growing season. The tradition of mutual cooperation and the use of local resources is still strong, and they are important social capital in the management of the dam border area. Village infrastructure, such as access roads and public facilities, is still developing and needs to be upgraded to support economic and tourism activities. The source of population data in the Catchment Area comes from statistical data in numbers (BPS-Statistics Indonesia); the number of people per village in the Catchment Area is calculated based on the proportion of the area of each village that enters the Catchment Area. The results of the analysis show that the total population in the Catchment Area area is estimated to be 114 people spread across 3 sub-districts. Residents can play a role as subjects or objects of planning. The characteristics of the community in the study area show social and cultural characteristics that are important factors in supporting development activities. The values of kinship and togetherness still dominate the social character of the community. The principle of strong cooperation makes people tend to be more collaborative than individualists, creating a solid foundation for community-based development. The role of community leaders and government officials is very significant in social life. These figures function as role models, provide direction, and become a bridge between the community and the government in various development programs. Trust in community leaders strengthens social ties and motivates community participation in various development activities.

Ecological feasibility analysis of dam project sites

Morphometry and coverage of catchment areas of dam project sites

Based on the results of manual digitization using the Geographic Information System with basic data in the form of a map of the Indonesian Terrain (RBI) of Lombok Island on a scale of 1:25,000, information was obtained that the total area of the Catchment Area planned for the Mujur dam reached 77.39 km². This Catchment Area covers the area that serves as the primary source of water supply for the dam, which includes various types of land use, such as agricultural land, shrubs, residential areas, and secondary forests. The process of delimitation of the catchment area is carried out by considering topography, surface water flow patterns, and natural boundaries such as ridges.

A complete visualization of the scope and boundaries of the Catchment Area can be seen in Figure 3, which provides a comprehensive spatial overview to support the planning and management of this area.

The Catchment Area morphometry shows that the region has relatively varied topographic characteristics, ranging from flat areas to sloping and steep slopes, which affect the pattern of water flow towards the dam. Morphometry indices such as the length of the main flow, the density of the flow, and the elongation ratio indicate the potential of this area to hold and drain surface water optimally. The analysis also shows that this catchment area plays an important role in controlling sedimentation entering dams, especially from areas with high erosion levels due to suboptimal land cover.

In addition, the scope of this catchment area also shows great potential to support the hydrological function of the dam, both as a source of water supply for irrigation, domestic needs, and planned water tourism activities. Thus, catchment area management based on sustainability principles is very important to maintain the capacity and quality of water resources in the Mujur Dam area. Based on the results of GIS analysis with the basic data of the RBI Map of Lombok Island on a scale of 1:25,000, the catchment area of the Mujur Dam has the following morphometry.

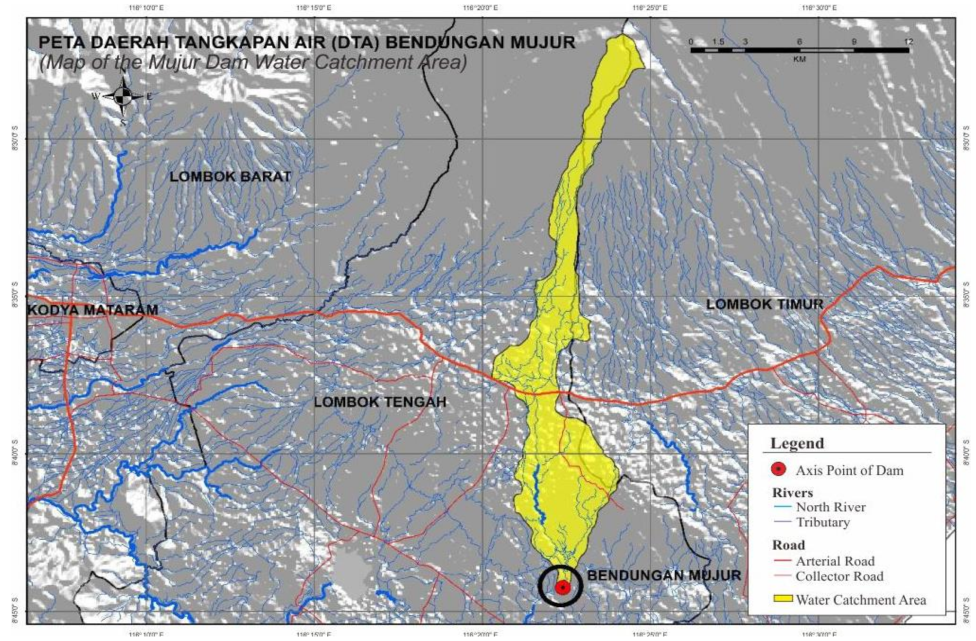

Figure 3. Catchment Area of the Mujur Dam (Source: consultant analysis, 2022)

Table 4 provides detailed information about the physical characteristics of the catchment area of the Mujur Dam. The area of the catchment area reaches 77.39 km² with the length of the main river as far as 43.76 km, and the total length of the river network reaches 204.81 km. The elevation of the catchment area varies significantly, from 122 meters above sea level (masl) at the lowest point to 2937.50 meters above sea level at the highest point, resulting in a height difference of 2815.50 meters. The length of the watershed reaches 33.60 km with an average width of 0.99 km, and the circumference of the watershed reaches 78.34 km. The density of the river in the catchment area is quite high, namely 2.65 km/km², indicating a dense river network and potentially supporting surface water collection. A meandering index value of 0.77 indicates that rivers in this region tend to turn or wind, which can affect flow patterns and erosion. This data is an important basis for understanding the hydrological capacity, flow patterns, and potential for sustainable management of the water catchment area.

Table 4. WCA Morphometry of the Mujur Dam (Source: Consultant Analysis 2022)

Information	Value	Unit
Water Catchment Area	77.39	Km^2
Length of the main river	43.76	Km
Total river length	204.81	Mdpl
Highest elevation	2937.50	Mdpl
Lowest elevation	122.00	Mdpl
Elevation difference	2815.50	Meter
Watershed length	33.60	Km
River density	2.65	Km/ km^2

Table 5. Data on the slope of the water catchment area (Source: Consultant Analysis in 2023)

Slope Gradient	Areas (Km^2)	Percentage (%)
0-8%	59.86	77.35
8-15%	8.29	10.71
>15-25%	2.43	3.14
>25-45%	3.06	3.95
>45%	3.75	4.85
Sum	77.39	100.00

Study of the slope of the catchment area of the dam project location

The slope conditions in the catchment area of the Mujur Dam show significant variations, ranging from areas with a flat slope (<8%) to areas with a very steep slope (>45%). Land that has a relatively flat slope is generally located in the downstream part of the water catchment, which is adjacent to the dam inundation area and is more suitable for land use such as settlements, agriculture, and plantations. In contrast, lands with steep slopes are in the upstream part of the catchment area, which has greater challenges in terms of land management and conservation and is vulnerable to soil erosion and degradation. This slope distribution pattern is important for designing and implementing appropriate area management policies to minimize negative impacts on ecosystem sustainability and dam function. More detailed information about the condition of the slope in the water catchment area can be seen in Table 5.

Based on the presentation of Table 5, the distribution of slopes in the Water Catchment Area (DTA) of the Mujur Dam is shown based on the slope class. Most of the water catchment area, which is 77.35% or 59.86 km², has a slope between 0-

8%, which generally covers flat and slightly sloping areas suitable for land use such as plantations and settlements. The 8-15% slope class covers an area of 8.29 km² (10.71%), which is often used for agriculture and gardens. Areas with steeper slopes, between 15-25% and 25-45%, cover 2.43 km² (3.14%) and 3.06 km² (3.95%), respectively. Areas with very steep slopes of more than 45% cover 3.75 km² (4.85%) of the total catchment area, which usually have greater management challenges and are prone to erosion. Overall, the total area of the catchment area is 77.39 km².

Table 6. Recapitulation of average rainfall at 4 Nearby Stations (Source: DD Mujur Dam in 2023)

Station	Average monthly rainfall (mm)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Kopang	279	231	293	211	63	74	31	8	59	123	231	256
Pengadang	265	213	201	143	58	28	12	8	32	67	222	251
Loang Maka	194	160	125	77	37	23	16	4	19	32	129	185
Perian	310	256	306	182	91	57	36	22	63	177	303	284
Average	262	215	231.3	153.3	62	46	24	11	43	100	221.3	244

Climatology and water supply study on critical lands around dam areas

Based on an interview with a geology expert from the consulting firm PT Massuka, it was explained that the location of the site plan of the Mujur Dam is located in the Kalibabak Formation with lithology in the form of breccia and lava. This Kalibabak formation covers the Kalipalung Formation, where the strategic positions of the formation are mutually exclusive. The climatological condition in the area around the location of the Mujur Dam is influenced by two tropical climates, namely the rainy season and the dry season. The rainy season starts from November to April, while the dry season is from May to October. The data that affect the climate in the Renggung watershed are 1). The average monthly temperature is around 26°C, 2). The average annual relative air humidity at Keruang and Kopak Climatology Stations is 75%, 3). Average evaporation of 4.5 mm/day, 4). The average solar irradiation is 55%. 5). The average daily wind speed is 60 km/day. Based on the results of previous investigations, the bedrock at the dam location is lava deposits and lake sediments. Lahars are in the form of coarse soil deposits or breccia, while silt and sand matrices dominate lake deposits of fine-sized rocks. The sediments found are not uniform, with both vertical and horizontal spreads. Generally, the spread changes only a few meters. Changes occur in grain size, composition, and degree of consolidation. Generally, it is in the form of sandwich lens interspersed hoses. Because the deposits mentioned above are young and not layers of weathered rock cover all, the process of consolidation and cementation is not perfect. As for the rainfall aspect, based on the monthly average rainfall of Kopang, Pengadang Loang Make and perian rain stations, an average rainfall recapitulation was obtained (Table 6). Meanwhile, judging from the water supply at the location of the Mujur Dam located in the Renggung watershed on the eastern island of Lombok, where the rainfall conditions in this area are relatively smaller when compared to the western island of Lombok. The Renggung watershed itself is a small watershed whose discharge is very minimal, even non-existent during the dry season (Figure 5). Based on these data, the source of irrigation for this dam is planned to utilize the existing interconnection system from the High-Level Diversion Babak system, Jurang State Canal, and excess water from the Jangkok—Babak system with the construction plan of the Meninting dam.

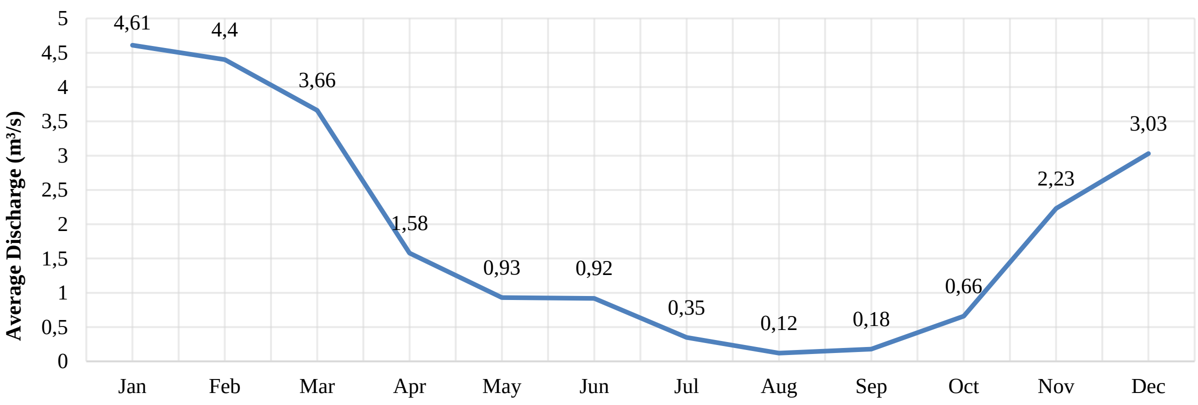

Figure 5. Average Monthly Discharge of Sungai Renggung (Source: FS DAM of Mujur, 2021)

Concept design of dam reverscape as a tourist destination

The Catchment Area of the Mujur Dam has great potential to be developed into a border landscape-based tourist destination that combines environmental conservation with tourism activities. Based on data, land use in this area is dominated by gardens (36.13%) and forests (17.91%), which provide opportunities to create green spaces as well as nature-based tourist attractions (Figure 7). With an area of 77.39 km² water catchment, the site planning of the river border area integrates natural elements such as local vegetation (teak trees, mahogany, and shrubs) with contour arrangements that support the ecological and aesthetic functions of the area. Border landscape design prioritizes adaptation to natural conditions. For example, areas with a flat land slope (<8%) covering 77.35% of the total the Catchment Area are used for the location of public facilities such as bicycle paths, picnic areas, and water tourism rides around the dam inundation (Figure 6). This approach aims to minimize the cut-and-fill process that can damage soil structures and disrupt local ecosystems.

Figure 6. Map of the site plan of the eastern dam boundary area (Source: mapping report document for Mujur Dam Project Consultants, 2024)

A B C D

Figure 7. Riverscape design concept for the Mujur dam area: (A) Fishing spot and jogging track landscape, (B) Children's playground landscape, (C) Education and souvenir center, (D) Recreation and sports area (Source: designed by a consultant, with the concept and layout developed by the author)

The main concept of the design of this area is "Building as Nature Tourism," which emphasizes the optimization of nature as an integral part of the design. The structures and facilities in the river border area are designed in harmony with the environment, both in terms of spatial planning and building shape. This aims to maintain a balance between environmental conservation and land use for tourism. For example, the vegetation at the site is still maintained as part of the design, thus creating a beautiful atmosphere that supports nature-based tourist attractions. In addition to ecological functions, this design also pays attention to social and economic sustainability aspects. By integrating tourism activities with the empowerment of local communities, the river border area is expected to create new economic opportunities for local residents. For example, the concept of agrotourism that utilizes gardens and fields in the Catchment Area can provide an educational experience for visitors while increasing community income through the marketing of local agricultural products such as tobacco and crops. Overall, the concept of designing the Mujur Dam border area site not only supports the sustainability of the ecosystem but also serves as a model for multifunctional tourist destinations that contribute to improving the quality of life of local communities. With this approach, river border areas can catalyze sustainable environmental conservation-based development in Indonesia. In addition, the site planning in the boundary area of the Mujur Dam is designed to take advantage of the natural conditions of the area, such as the contours and vegetation that already exist.

The main building is planned on low-slope land to minimize the cut-and-fill process that can damage the soil structure and reduce ecological stability. This is in line with the sustainability principles that are the basis for the management of this area, where adaptive design is used to preserve existing natural elements. Local vegetation, such as teak and mahogany trees, is utilized as part of the design elements to create a natural and beautiful atmosphere that supports the tourist attraction. Figure 7 shows that the circulation of the parking area around the dam is specially designed for pedestrians, with a parking area placed near the main gate. This ensures that the parking area becomes a vehicle-free zone, providing a safe and comfortable recreational experience for visitors. The circulation concept applied is circular circulation, which connects each main activity area in the park, such as water tourism spots, agro-tourism, and sports spots. This approach not only makes it easier for visitors to access various facilities but also supports efficient space management. Adaptation to the contours of the land is also applied to maintain soil stability, especially in areas with higher slopes. This circulation pattern supports connectivity between areas while paying attention to the safety and comfort of visitors. In addition, this concept allows for the development of flexible public spaces to support various recreational activities, ranging from educational activities to commercial activities. With a sustainability-focused approach, this border landscape planning is expected to provide social, economic, and ecological benefits for the local community. This strategic circulation arrangement also supports the optimization of the area's function as a multifunctional tourist destination that combines environmental conservation with local community empowerment.

Target groups and economic impacts of riverscape tourism objects

The groups of users and visitors of the tourist area around the Mujur Dam can be categorized into three main groups: visitors, tenants/ retail fillers, and cleaning and security officers. Visitors include people from various walks of life and ages, both from the area around the dam and from urban areas. This group is a key element in utilizing tourist facilities such as culinary areas, selfie spots, and water tourism. In addition to making an economic contribution through entrance tickets and purchasing local products, the presence of visitors also strengthens awareness of the importance of environmental sustainability through direct interaction with education-based tourism and nature. Tenants or retail fillers play a central role in supporting economic activities in tourist areas. They manage various commercial facilities, including culinary establishments, souvenir shops, tourist attractions, and the sale of locally cultivated products. These tenants can come from local communities or outside investors who want to contribute to the development of the area. Tenant activities not only open up business opportunities but also help create an inclusive economic ecosystem. Renting stalls, selling crops, and managing tourist attractions provide additional opportunities for local communities to increase their income.

In addition, collaboration with tenants from outside the area expands the marketing network and increases the attractiveness of tourist areas at the regional level. Cleaning and security officers, including parking attendants, have an important role in maintaining the comfort and safety of tourist areas. They are tasked with ensuring environmental cleanliness, maintaining public facilities, and maintaining order during area operations. With working hours set before and after operational hours, this group plays a strategic role in maintaining the sustainability and comfort of the tourist area. The involvement of local communities as officers not only reduces the unemployment rate but also strengthens the sense of ownership of the area, which ultimately supports sustainable management of the area. The existence of these three groups creates synergies that support the ecological, social, and economic functions of tourist areas. Visitors benefit from recreation and education, tenants gain economic opportunities, and local officers gain jobs that support their livelihoods. This combination supports the development of the border area of the Mujur Dam as a tourist destination that not only has a positive impact on visitors but also empowers people affected by inundation. This cross-sectoral collaboration strategy is aligned with the region's sustainability goals through the integration of social, economic, and ecological functions.

DISCUSSION

Socio-ecological feasibility analysis of dam projects

The existence of the Mujur Dam project and the surrounding river border area provide significant benefits for the local community and the surrounding environment. Socially, the development of this area can improve the quality of life of the community by opening new economic opportunities, such as tourism management, culinary services, and the provision of local products. Activities such as renting fishing equipment, managing water tourism spots, and selling handicrafts or agricultural products are additional sources of income for the community. Social values rooted in cooperation and kinship are strong social capital to encourage active community participation in the management of this tourist area. On the other hand, the role of strong and respected community leaders can be used to motivate local communities to be involved in environmental conservation programs and sustainable management of the area. Ecologically, the border area has an important role in maintaining environmental stability and hydrological functions in the DTA of the Mujur Dam. With an area of 77.39 km², this area has a high river density (2.65 km/km²), which supports the capacity of surface water management and sedimentation control. Local vegetation in the river border area helps stabilize the slopes, especially in areas with a slope of more than 45%, which are prone to erosion. Efforts to organize the area by minimizing the cut-and-fill process and maintaining natural vegetation at the site also contribute to maintaining biodiversity in this area. In addition, the border landscape also has the potential as an environmental education area. The arrangement of the area that combines tourism and conservation functions provides a direct experience for visitors regarding the importance of maintaining river ecosystems and water resources. This eco-friendly design concept supports sustainability not only from an ecological but also a social perspective by involving the community in the management and preservation of the area. This creates a synergy between social and ecological benefits, making the border area of the Mujur Dam a model of sustainable development.

Evaluation of riverscape potential for tourism

The riverscape area or border landscape around the Mujur Dam has great potential to be developed as an ecological-based tourist destination. The results of the analysis show that the dam catchment area covers an area of 77.39 km², covering various types of land use, such as agricultural land, shrubs, residential areas, and secondary forests. This diversity of land use provides opportunities to create diverse tourist attractions, including nature tourism, environmental education, and community-based ecotourism. In addition, the existence of natural elements such as streams, hills, and native vegetation can be leveraged to create a unique and immersive tourist experience. However, this potential must be evaluated based on a sociocultural and ecological approach. The development of tourism in the riverscape area requires a design that is not only aesthetic but also adaptive to the needs of local communities and environmental conditions.

In this study, a community participation-based approach through FGD has shown that the surrounding community aspires to utilize the border area as a tourist destination while still protecting its ecological function. This aspiration can be realized by integrating ecological landscape design, such as eco-friendly walking trails, habitat conservation zones, and recreational areas that support local activities such as fishing and picnics. In addition, the evaluation of the potential of the riverscape for tourism needs to consider economic and environmental sustainability. For example, secondary forest areas and shrubs can be preserved as conservation zones that are also tourist attractions. With proper planning, this riverscape area can function as the main support for water-based ecotourism, increase people's economic income, and support the conservation of local ecosystems. Efforts like this have proven effective in several countries, such as China and Thailand, where river border landscapes have been successfully developed into environmentally friendly tourist destinations (Fung et al., 2019; Shang, 2018).

Comparative study with other case studies

In evaluating the potential for dam construction on critical land around Das Mujur, case studies from various countries provide valuable insights into the challenges and opportunities in the management of riverscape areas. Research in Zimbabwe, for example, shows that small dams can provide significant benefits for irrigation and food security. However, negative impacts on ecosystems, such as declining fish populations and land-use conflicts, are often consequences that must be managed properly (Gwazani et al., 2012). This condition is relevant to the potential for conflicts between users in the Mujur Dam area, especially related to the use of borderland for tourism and conservation activities. In Thailand, research on the impact of small dams shows that although this infrastructure contributes to flood mitigation, its impact on the socio-economy of communities is not always even (Fung et al., 2019). This is an important lesson for the development of the Mujur Dam border area so that the benefits produced can be felt inclusively by all community groups, including local farmers, tourism actors, and vulnerable groups. Compared to other experiences in managing river border areas for tourism, it can also inspire the Mujur Dam project. A river restoration project in Xining, China, has succeeded in improving the quality of the urban environment and socio-ecological system by utilizing the river border as a public space and nature-based tourist destination (Shang, 2018). This approach is relevant to the Mujur Dam, where the border area can be designed as a multi-functional space that supports tourism, conservation, and local community activities. In addition, in France, landscape transformation due to the removal of dams shows that stakeholder engagement is essential in managing new landscape configurations that emerge. The project has succeeded in increasing the involvement of local communities in redesigning the function of the border area, ultimately strengthening the social and environmental sustainability of the area (Germaine & Gonin, 2024). This concept can be adapted in the Mujur Dam through a participatory approach that involves the community in every stage of planning and management of the border area. From this comparative study, the success of riverscape management is highly dependent on the integration of ecological, social, and economic aspects. The Mujur Dam has a great opportunity to adopt best practices from various case studies, such as ecological restoration, environmental quality improvement, and community empowerment. Thus, the development of this area is expected not only to increase tourism potential but also to become a model for sustainable dam management at the local and national levels.

Challenges and opportunities for sustainable development of Dam Tourism Areas

The critical land use in the Water Catchment Area (DTA) of the Mujur Dam, which is dominated by fields, has great potential to be optimized through the integration of tourism and agricultural functions. The concept of education-based tourism is the main foundation in the development of this area, aiming to increase public awareness about the importance of maintaining the balance of nature for the sustainability of the ecosystem. One approach that can be done is through the development of agrotourism, which takes advantage of the potential of local agriculture such as tobacco cultivation and harvesting—the main commodity in Lombok. This not only increases farmers' income but also strengthens local identity as an agrarian tourism destination. The park area around the dam is designed to support a variety of tourist activities, including nature tourism, culinary, sports, performing arts, and commercial activities. Various planned tourist spots provide economic, social, and ecological benefits. Fishing spots, for example, offer opportunities for local communities to provide services such as fishing tackle rentals, which can increase local income. Selfie spots and water tourism, such as duck boats, canoes, or speedboats, not only add to tourist attraction but also expand the earning potential of the nature-based tourism sector.

In addition, this area is equipped with culinary spots and souvenir spots that support micro and small businesses in the surrounding community. This facility provides a platform for the community to market regional products, such as traditional foods, garden products, and handicrafts. This approach not only strengthens the local economy but also increases community involvement in the management of tourist areas. In an effort to improve the quality of life of the local community, sports and recreation spots, such as running tracks and bicycle paths, are also designed, which create healthy and inclusive public spaces. Meanwhile, the performing arts spot provides a space to display Lombok's typical art and culture, as well as opening opportunities for collaboration with artists from outside the region. The successful development of this river border area requires a multidisciplinary approach that integrates landscape design, environmental conservation, and local community empowerment. The arrangement of this area not only provides recreational benefits for visitors but also supports environmental conservation, increases social interaction, and creates new jobs. By combining ecological, social, and economic functions, the management of this area is able to answer the economic needs of communities affected by inundation, strengthen Lombok's tourist attraction, and become an important model for sustainable management of critical land in Indonesia.

CONCLUSION

The construction of dams on vital land, particularly in river border regions, necessitates a more efficient and sustainable strategy to address the water crisis. The development of the river border area as a water-resource-based tourist attraction is a pertinent solution that can yield immediate economic advantages for the local community. This research significantly enhances the comprehension of the configuration of dam boundary areas, emphasizing the advancement of recreational and ecotourism purposes. The analytical results indicate that leveraging the river border area as a tourist destination can significantly enhance the welfare of individuals impacted by flooding. Utilizing boundary space for sustainability-oriented tourism activities can enhance the revenue of the local population and bolster the socio-ecological sustainability of dam construction initiatives.

This strategy anticipates that dam management will evolve from only supplying water services to stimulating the local economy. This is crucial for fostering synergy among the technical requirements, environmental conservation, and social welfare of the community, particularly for those residing near the dam. This study underscores the necessity of reconciling social and ecological advantages in significant infrastructure development projects, such as dams, to achieve a balance among technical considerations, environmental sustainability, and the economic welfare of impacted populations.

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Author Contributions: Conceptualization, R.A.; methodology, S.S. and S.W.; validation, I.K.A. and S.S; formal analysis, R.A. and S.S. and H.B.; investigation, R.A. and H.B.; data curation, R.A. and S.S. and I.K.A.; writing - original draft preparation, R.A.; writing - review and editing, R.A. and S.S. and I.K.A. and S.W.; visualization, R.A.; supervision, S.S. and I.K.A. and S.W.; project administration, R.A. and S.W. All authors have read and agreed to the published version of the manuscript.

Funding: This article is fully funded by the Indonesian Education Scholarship (BPI), the Center for Higher Education Funding and Assessment - Ministry of Higher Education, Science and Technology, Republic of Indonesia, and the Education Fund Management Institution (LPDP), Ministry of Finance, Republic of Indonesia.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgements: We would like to thank (1) Beasiswa Pendidikan Indonesia (BPI), the Center for Higher Education Funding and Assessment - Ministry of Higher Education, Science and Technology, Republic of Indonesia, and (2) the Education Fund Management Institution (LPDP), Ministry of Finance, Republic of Indonesia, for providing scholarships to the first and fifth authors (BPI number: 202101121002/202329113124/202329113124). In addition, we greatly appreciate the assistance of the Academic Publication Centre (PUBLIKA); Research Ethics Commission, State University of Malang, for ethical clearance assistance and manuscript editing services.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Akhmad, R., Sumarmi, S., Astina, I. K., Wagistina, S., Malang, U. N., & Timur, J. (2025). A sustainability trilogy approach for drought risk prevention : Case study in Indonesia. *Jàmbá - Journal of Disaster Risk Studies*, *17*(1), 1–12. https://doi.org/10.4102/jamba.v17i1.1811

Akyıldız, S. T., & Ahmed, K. H. (2021). An Overview of Qualitative Research and Focus Group Discussion. *International Journal of Academic Research in Education*, *7*(1), 1–15. https://doi.org/10.17985/ijare.866762

Alyani, F., Putri, I., Mulyati, S., Nur, W., Putri, S., & Irpan, A. (2024). Management of Non-Productive Land and Development of Educational Tourism to Improve the Welfare of Farming Communities: Case Study of Jalatrang Village. *Jatimas : Jurnal Pertanian Dan Pengabdian Masyarakat*, *4*(2), 121–130. https://doi.org/https://doi.org/10.30737/jatimas.v4i2.6068

Amalia, M., & Malihah, E. (2016). Land Acquisition Conflict for Jatigede Dam Construction in Wado Village. *Sosietas*, *6*(2). https://doi.org/10.17509/sosietas.v6i2.4248

Bian, H., Li, M., Deng, Y., Zhang, Y., Liu, Y., Wang, Q., Xie, S., Wang, S., Zhang, Z., & Wang, N. (2024). Identification of ecological restoration areas based on the ecological safety security assessment of wetland-hydrological ecological corridors: A case study of the Han River Basin in China. *Ecological Indicators*, *160*(December 2023), 111780. https://doi.org/10.1016/j.ecolind.2024.111780

Burrier, G. A., & Hultquist, P. (2019). Temples, travesties, or something else? The developmental state, ecological modernization, and hydroelectric dam construction in India. *World Development*, *124*, 104642. https://doi.org/10.1016/j.worlddev.2019.104642

Bustami, S. Y., Hidayat, A., Rizki, K. Z., Makhroja, M. N., Studi, P., Internasional, H., Hukum, F., Mataram, U., & Barat, N. T. (2023). Sustainable Investment Literacy Enhancement Workshop in Mandalika Special Economic Zone. *National Seminar on Community Service 2023 LPPM University of Mataram*, *5*, 1–10. https://proceeding.unram.ac.id/index.php/pepadu/article/view/668

Chukwuka, A. V., Nwabuisiaku, C., Adegboyegun, A. D., Sharafadeen, O., & Shukwunweizu, M. M. (2023). Remotely Sensed Assessment of Mining Severity Within Buffer Zones of Osun River: Implications for Drinking Water Quality, Biodiversity Protection, and Status as UNESCO World Heritage Site. *Water, Air, and Soil Pollution*, *234*(11), 1–19. https://doi.org/10.1007/s11270-023-06694-x

Creswell, J. W. (2018). *Research Design Qualitative, Quantitative, and Mixed Methods Approaches* (Helen Salmon Content (ed.); Fifth Edit, 4(1). SAGE Publications, Inc. https://extranet.ogs.edu/ogsdial/upload/OXFORD/2024/2643/resources/Creswell_2018.pdf

Donkoh, S. (2023). Application of triangulation in qualitative research. *Journal of Applied Biotechnology & Bioengineering*, *10*(1), 6–9. https://doi.org/10.15406/jabb.2023.10.00319

Dunham, J. B., Angermeier, P. L., Crausbay, S. D., Cravens, A. E., Gosnell, H., McEvoy, J., Moritz, M. A., Raheem, N., & Sanford, T. (2018). Rivers are social–ecological systems: Time to integrate human dimensions into riverscape ecology and management. *Wiley Interdisciplinary Reviews: Water*, *5*(4), 1–10. https://doi.org/10.1002/WAT2.1291

Emmanuel, A., Edward, A., & Thomas, A.-D. (2020). Socioeconomic Impact of Development Projects on the Livelihood of Farmers: A Case Study of the Bui Dam Hydroelectric Project. *Journal of Geography, Environment and Earth Science International*, *24*(1), 34–44. https://doi.org/10.9734/jgeesi/2020/v24i130192

Fanta, B., Zemarku, Z., & Bojago, E. (2024). Adoption of community-based land rehabilitation programs (CBLRP) and its effect on livelihoods in Offa district, south Ethiopia. *Journal of Agriculture and Food Research*, *16*(February), 101104. https://doi.org/10.1016/j.jafr.2024.101104

Fung, Z., Pomun, T., Charles, K. J., & Kirchherr, J. (2019). Mapping the social impacts of small dams: The case of Thailand's Ing River basin. *Ambio*, *48*(2), 180–191. https://doi.org/10.1007/s13280-018-1062-7

Gates, E. F., Page, G., Crespo, J. M., Oporto, M. N., & Bohórquez, J. (2023). Ethics of evaluation for socio-ecological transformation: Case-based critical systems analysis of motivation, power, expertise, and legitimacy. *Evaluation*, *29*(1), 23–49. https://doi.org/10.1177/13563890221129640

Germaine, M. A., & Gonin, A. (2024). Experiencing the landscape: landscape agency in a multifunctional valley after dam removal on the Sélune River, France. *Ecology and Society*, *29*(1). https://doi.org/10.5751/ES-14868-290123

Gwazani, R., Gandiwa, E., Gandiwa, P., Mhaka, V., Hungwe, T., & Muza, M. (2012). The socio-ecological impacts of small dams: A case study of Mushandike Sanctuary, Zimbabwe. *Journal of Sustainable Development in Africa*, *14*(February 2021), 184–194.

Isukuru, E. J., Opha, J. O., Isaiah, O. W., Orovwighose, B., & Emmanuel, S. S. (2024). Nigeria's water crisis: Abundant water, polluted reality. *Cleaner Water*, *2*(July), 100026. https://doi.org/10.1016/j.clwat.2024.100026

Jahura, S., Islam, M. S., & Mostafa, M. G. (2024). Impact of water scarcity on rural livelihood in the drought-prone region: A review of global perspectives. *Indonesian Journal of Social Sciences*, *16*(1), 1–13. https://doi.org/10.20473/ijss.v16i1.49143

Johnson, D. N., van Riper, C. J., Stewart, W. P., Metzger, M. J., Oteros-Rozas, E., & Ruiz-Mallén, I. (2022). Elucidating social-ecological perceptions of a protected area system in Interior Alaska: a fuzzy cognitive mapping approach. *Ecology and Society*, *27*(3). https://doi.org/10.5751/ES-13424-270334

Kanownik, W., Policht-Latawiec, A., Możdżeń, M., & Dąbrowska, J. (2024). Deciphering anthropogenic impact: A multifaceted statistical analysis of physico-chemical parameters in a catchment with limited water quality data. *Desalination and Water Treatment*, *320*(August), 100689. https://doi.org/10.1016/j.dwt.2024.100689

Khairina, E., Purnomo, E. P., & Malawnai, A. D. (2020). Sustainable Development Goals: Environmentally Conscious Policies to Maintain Environmental Resilience in Bantul Regency, Special Region of Yogyakarta. *Jurnal Ketahanan Nasional*, *26*(2), 155. https://doi.org/10.22146/jkn.52969

Kusters, K. (2015). *Climate-Smart Landscapes and Approaches: an exploration of the concept and its practical applications*.

Lara-Valencia, F., Coronado, I., Mumme, S., Brown, C., Ganster, P., García-Pérez, H., Lybecker, D., Megdal, S. B., Sanchez, R., Sweedler, A., Varady, R. G., & Zuniga-Teran, A. (2023). Water Management on the U.S.-Mexico Border: Achieving Water Sustainability and Resilience through Cross-Border Cooperation. *Journal of Borderlands Studies*, *38*(2), 323–334. https://doi.org/10.1080/08865655.2023.2168294

Lisetskii, F. N., & Buryak, Z. A. (2023). Runoff of Water and Its Quality under the Combined Impact of Agricultural Activities and Urban Development in a Small River Basin. *Water (Switzerland)*, *15*(13). https://doi.org/10.3390/w15132443

Lv, T., Zeng, C., Lin, C., Liu, W., Cheng, Y., & Li, Y. (2023). Towards an integrated approach for land spatial ecological restoration zoning based on ecosystem health assessment. *Ecological Indicators*, *147*(February), 110016. https://doi.org/10.1016/j.ecolind.2023.110016

Machdi, I., Utami, D. R. W. W., Romzi, M., Rorayyan, P. H., Kurniawan, P. A., Sarpono, & Efliza. (2024). Statistical Yearbook of Indonesia 2024. In B. Muslim, M. R. Syafrizal, R. Ghaniswati, C. A. Ardania, M. Burhan, & D. Wijayanti (Eds.), *BPS-Statistics Indonesia* (Vol. 52). BPS-Statistics Indonesia. https://www.bps.go.id/publication/2020/04/29/e9011b3155d45d70823c141f/statistik-indonesia-2020.html

Madomguia, D., Nya, E. L., Njomou-Ngounou, E. L., Gatcha-Bandjun, N., Mwamila, T. B., Balna, J., Halimassia, E., Metsebo, J., Letah Nzouebet, W. A., Tchoumbe, R. R., Bon, A. F., Gwenzi, W., & Noubactep, C. (2025). Revisiting water resources management in the Mandara Mountains. *Heliyon*, *11*(1). https://doi.org/10.1016/j.heliyon.2025.e41692

Molden, D., Oweis, T., Steduto, P., Bindraban, P., Hanjra, M. A., & Kijne, J. (2010). Improving agricultural water productivity: Between optimism and caution. *Agricultural Water Management*, *97*(4), 528–535. https://doi.org/10.1016/j.agwat.2009.03.023

Munyai, R., Ogola, H. J. O., Wambui Kimani, V., & Modise, D. M. (2024). Unlocking water potential in drylands: Quicklime and fly ash enhance soil microbiome structure, ecological networks and function in acid mine drainage water-irrigated agriculture. *Heliyon*, *10*(6). https://doi.org/10.1016/j.heliyon.2024.e27985

Naderi, L., Karamidehkordi, E., Badsar, M., & Moghadas, M. (2024). Impact of climate change on water crisis and conflicts: Farmers' perceptions at the ZayandehRud Basin in Iran. *Journal of Hydrology: Regional Studies*, *54*(June), 101878. https://doi.org/10.1016/j.ejrh.2024.101878

Park, J. Y., & Kim, S. J. (2014). Potential impacts of climate change on the reliability of water and hydropower supply from a multipurpose dam in south korea. *Journal of the American Water Resources Association*, *50*(5), 1273–1288. https://doi.org/10.1111/jawr.12190

Prasetyo, H. (2022). Privatization of Clean Water in The Perspektive of Islamic Economics. *Journal Competency of Business*, *9*(2), 356–363.

Seijger, C., Urfels, A., Christoforidou, M., Hellegers, P., Borghuis, G., Langan, S., & van Halsema, G. (2025). More food, but less land and water for nature: Why agricultural productivity gains did not materialize. *Agricultural Water Management*, *307*(September 2024), 109229. https://doi.org/10.1016/j.agwat.2024.109229

Shang, J. (2018). Riverfront Landscape Based on the Idea of River Restoration: A Case Study of the Riverfront Landscape of Duoba New District in Xining City. *Journal of Building Construction and Planning Research*, *06*(03), 151–161. https://doi.org/10.4236/jbcpr.2018.63011

Snizhko, S., Didovets, I., & Bronstert, A. (2024). Ukraine's water security under pressure: Climate change and wartime. *Water Security*, *23*(October), 100182. https://doi.org/10.1016/j.wasec.2024.100182

Tan, J., Peng, L., Wu, W., Zhang, H., & Tang, C. (2024). Exploring the evolution and trade-off within a socio-ecological system in karst regions: A case study of Huanjiang County, China. In *Geography and Sustainability*. Elsevier B.V. https://doi.org/10.1016/j.geosus.2024.100256

Tan, X., Liu, B., Tan, X., Huang, Z., & Fu, J. (2024). Projected climate change impacts on the availability of blue and green water in a watershed of intensive human water usage. *Journal of Hydrology: Regional Studies*, *53*(January), 101827. https://doi.org/10.1016/j.ejrh.2024.101827

Ujuagu, G. I., Ejeromedoghene, O., Enwemiwe, V., Mgbechidinma, C. L., Omoniyi, A. O., Oladipo, A., & Gu, J. (2025). Exploring the toxicology, socio-ecological impacts and biodegradation of microplastics in Africa: Potentials for resource conservation. *Toxicology Reports*, *14*(November 2024), 101873. https://doi.org/10.1016/j.toxrep.2024.101873

Woldu, M. G. (2018). Community based tourism in Lake Tana growth corridor of the Amhara region of Ethiopia: The missing link among stakeholders and implications to tourism industry. *Cogent Social Sciences*, *4*(1). https://doi.org/10.1080/23311886.2018.1450335

Wulandari, D. P., Trihayuningtyas, E., & Wulandari, W. (2021). Development of Jatiluhur Reservoir as an Integrated Tourism Area in Purwakarta Regency. *Rang Teknik Journal*, *4*(2), 383–397. https://doi.org/10.31869/rtj.v4i2.2658

Article history: Received: 21.02.2025 Revised: 21.05.2025 Accepted: 12.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1243-1253
DOI 10.30892/gtg.602spl21-1497

HOSPITALITY LEADING GREEN FOR A SUSTAINABLE SCENE: THE MEDIATING ROLE OF GREEN ORGANIZATIONAL CULTURE IN THE RELATIONSHIP BETWEEN GREEN SERVANT LEADERSHIP AND ENVIRONMENTAL PERFORMANCE

Ahmed HASANEIN[1*], Abdelmoneim METWALLY[2]

[1] King Faisal University, Management Department, College of Business Administration, Al-Ahsaa, Saudi Arabia; aabdelrazek@kfu.edu.sa (A.H.)
[2] King Faisal University, Accounting Department, College of Business Administration, Al-Ahsaa, Saudi Arabia; abmetwally@kfu.edu.sa (A.M.)

Citation: Hasanein, A., & Metwally, A. (2025). Hospitality leading green for a sustainable scene: The mediating role of green organizational culture in the relationship between green servant leadership and environmental performance. *Geojournal of Tourism and Geosites*, 60(2spl), 1243–1253. https://doi.org/10.30892/gtg.602spl21-1497

Abstract: Amidist the increasingly pressing environmental issues confronting hospitality businesses, there arises an urging demand for the adoption of sustainable leadership paradigms. This study seeks to explore the influence of green servant leadership (GSL) on environmental performance (ENVP) within the Saudi Arabian hospitality sector, with a keen focus on the mediating function of green organizational culture (GOC). This study deployed on a purposive sampling technique with the engagement of 420 employees from the hospitality industry in the Eastern Region of Saudi Arabia. Further, the data analysis was conducted through using the partial least squares structural equation modeling to scrutinize the intricate connections among GSL, GOC, and ENVP. The study results revealed that GSL significantly bolsters both GOC and ENVP, underscoring its pivotal role in advancing sustainability within the sector. Furthermore, the study identified GOC as a crucial mediator in the nexus between GSL and ENVP, accentuating its significance in fostering environmentally conscious practices within organizational settings. By addressing these questions, this research seeks to contribute to the broader discourse on sustainable leadership by offering empirical insights into the role of GSL in encouraging environmental responsibility and supporting sustainable tourism development. Additionally, the research posits that GSL could serve as a catalyst for promoting environmental stewardship in the realm of hotel management, thereby enriching the ongoing dialogue on sustainable leadership methodologies. Beyond theoretical implications, this research furnishes practical recommendations for managerial tactics and policy formulation, aiming to bridge the gap between theory and application. Furthermore, it beckons for future investigations that should be deeper into the nuances of sustainable leadership dynamics concerning environmental performance in the hospitality domain. By shedding light on the intricate interplay among GSL, GOC, and ENVP, this study not only expands the scholarly understanding but also offers valuable insights into effective leadership strategies for fostering sustainability in the hospitality industry.

Keywords: green servant leadership, green organizational culture, environmental performance, hospitality industry, hospitality industry, Saudi Arabia

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INTRODUCTION

The globe is experiencing a sharp rise in ecological issues, driven by overuse of resources and the expansion of industrial activities (Aljoghaiman et al., 2024; Cai & Li, 2018; Yu et al., 2020; Ayad & Hasanein, 2024; Ayad et al., 2024). Companies face growing demands from stakeholders to handle hazardous waste responsibly and engage actively in conservation initiatives, as staying competitive increasingly depends on ecological accountability (Tang et al., 2018; AL-Khatib & Shuhaiber, 2021; Asiaei et al., 2022b). The growth of industrial operations has significantly worsened problems such as air and water contamination, along with increasing global temperatures (Singh et al., 2020). Producers are under heightened pressure to integrate ecological concerns into their operations to prevent losing stakeholder trust and market position (Alnaim & Metwally, 2024a; Buhaya & Metwally, 2024). Neglecting to adopt sustainable practices not only risks estranging clients and financiers but also endangers the long-term viability of the enterprise (Alnaim & Metwally, 2024b; Kassim et al., 2022; Cheng et al., 2023; Gunarathne et al., 2021; Asiaei et al., 2022a).

While financial hurdles may arise, studies emphasize the importance of focusing on sustainable resource use and strengthening organizational adaptability (Bassey et al., 2013; Begum et al., 2022; Kang et al., 2021). This encourages production firms to engage in Corporate Social Responsibility (CSR) efforts and explore new approaches in product design to address the increasing call for environmentally conscious practices from stakeholders (Channa et al., 2021). Due to the above pressures companies are now moving to more eco-friendly innovations, aiming to improve their environmental footprint (Alnaim & Metwally, 2024a; Ali et al., 2024; Buhaya & Metwally, 2024; Hanif et al., 2023; Metwally et al., 2024).

The growing attention towards Corporate Social Responsibility program and their effect on environmental achievement have caught researchers attention in recent years. Organizations faces unique challenge in maintaining accountability while

[*] Corresponding author

pursuing green initiatives, which sparked debates among industry expert. Various research projects demonstrate how disclosure of eco-friendly programs influences company outcomes through different mechanisms (Metwally et al., 2022).

Within emerging economies, CSR programs create beneficial transformations in multiple areas. These include enhancement of CSR activities (Diab & Metwally, 2020), better financial performance (Sial et al., 2018), and higher levels of creativity (Abdelmotaleb et al., 2018). CSR initiatives serve as powerful tool for companies facing sociopolitical complexities, as it helps those companies to adapt to new management approaches (Diab & Metwally, 2020). Nevertheless, scholarly analysis suggests that CSR documentation occasionally prioritizes image management over authentic environmental dedication. It was reported that sustainability reporting might disguise reduction in operational expenses instead of genuine ecological commitments (Metwally et al., 2022).

In the hospitality and tourism industry, the focus on sustainability has increased recently, and became a central part of the discourse in the industry (Ayad et al., 2023; Hasanein, 2024; Saxuna et al., 2020; Sobaih et al., 2022a;2022b). While early studies on sustainability concentrated on organizational tactics, recent studies have more concentration on the vital role played by employees in successfully enhancing and embedding sustainable practices. Research has shown that having engaged employees who exhibit pro-environmental behavior is crucial for the success of effective environmental programs (Khan et al., 2020; Omarova & Jo, 2022). From these studies in the hospitality sector, it is now apparent that sustainable improvements are not only shaped by corporate policies but also are heavily influenced by the actions of individual employees (Luu, 2023). This shift in thinking from merely highlighting organizational accomplishments to valuing individual contributions provides a richer insight into the factors that drive sustainability and how organizations can foster eco-friendly behaviors among their staff (Darvishmotevali & Altinay, 2022; Tosun et al., 2022).

Another area of research that is related to employees and their actions that had great importance recently in literature is leadership style. As leadership has influence on how employees engage with environmental practices. Various leadership styles have been studied, including transformational leadership which was proved to motivate eco-friendly behaviors through an inspiring vision (Mittal & Dhar, 2016; Riva et al., 2021; Robertson & Barling, 2017), and ethical leadership, which emphasizes ethical decision-making and a commitment to sustainability (Ahmad et al., 2022; Xuecheng & Iqbal, 2022). However, servant leadership which is characterized by its focus on empathy, stewardship, and community has not been extensively studied within the hospitality sector (Afridi et al., 2024; Luu, 2019; Tuan, 2020).

Servant leadership could offer valuable insights into how to better encourage environmentally responsible behaviors among employees in this industry. Servant leadership has demonstrated potential in cultivating a positive organizational culture within hospitality businesses, fostering a work environment that promotes service-oriented behavior and innovation. Research has shown that servant leadership is associated with higher levels of organizational citizenship behavior (Bavik, 2020; Newman et al., 2017), inspiring employees to go beyond their basic job responsibilities (Wang et al., 2018).

Additionally, evidence suggests that this approach encourages innovation in the workplace and the adoption of forward-thinking management practices (Karatepe et al., 2020). Building on this, the concept of Green Servant Leadership (GSL) has emerged, which integrates the principles of servant leadership with a strong emphasis on environmental sustainability. GSL encourages employees to take on ecological responsibility, motivating them to adopt sustainable practices, such as conserving resources and minimizing waste (Afsar et al., 2018; Newman et al., 2017; Dey et al., 2022). The relationship between GSL and environmental performance can be explained by Self-Determination Theory (Deci & Ryan, 2012), which suggests that employees are more likely to engage in sustainable behaviors when they are intrinsically motivated, have a high sense of autonomy, competence, and belonging to the organization and its improvement. By creating a workplace that aligns personal values with larger environmental objectives, GSL empowers employees to take charge of sustainability initiatives, ultimately leading to improved environmental performance. However, there are many studies that concentrated on sustainability in the hospitality industry, and the role of leadership in encouraging pro-environmental behaviors and achieving positive environmental, and financial outcomes (Ahmed et al., 2022; Mittal & Dhar, 2016). There is still a lack of empirical research examining how GSL specifically impacts ENVP (Afridi et al., 2024; Patwary et al., 2023; Sun et al., 2021). Traditional leadership models often do not adequately address the unique environmental challenges faced by the hospitality industry (Ying et al., 2020). In contrast, GSL incorporates sustainability into its leadership practices, fostering a culture that actively promotes environmental stewardship (Patwary, 2023; Tuan, 2020). To fill part of this gap in literature the current study will explore the impact of GSL on ENVP, further it will examine the role of Green Organizational Culture (GOC) as a mediator in this relationship. By investigating how GOC enhances the effectiveness of GSL in promoting sustainability, the research aims to clarify the relationship between different leadership styles and organizational culture.

This focus is particularly important given the limited existing research on how GOC affects the connection between leadership and environmental outcomes. This study is set within Saudi Arabia’s hospitality and tourism sector, a rapidly growing industry with substantial ecotourism potential and complex environmental challenges. Much of the current sustainability research has focused on developed countries, often neglecting the unique contextual factors that influence sustainability practices in emerging markets. As Saudi Arabia aligns its tourism strategy with global sustainability goals, it becomes increasingly crucial to understand the role of leadership in fostering environmental responsibility within the hospitality industry. Consequently, this study aims to answer the following research questions: (1) How does Green Servant Leadership Influence Environmental Performance? and (2) Does Green Organizational Culture mediate the relationship between GSL and Environmental Performance? By addressing these questions, this research seeks to contribute to the broader discourse on sustainable leadership by offering empirical insights into the role of GSL in encouraging environmental responsibility and supporting sustainable tourism development. The remainder of this paper is organized as follows: Section 2 provides a theoretical framework for GSL and GOC, synthesizing existing literature to formulate the hypotheses of the study.

Section 3 details the research methodology, including sample selection, data collection methods, measurement tools, and empirical models. Section 4 presents the study's findings and discusses their implications for theory and practice. Finally, Section 5 concludes with a summary of key insights, limitations of the study, and suggestions for future research.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

1. Green servant leadership and environmental performance

Pioneered by Greenleaf, servant leadership revolves around the core principles of prioritizing the welfare of others (Greenleaf, 2007; Faraz et al., 2021; Aboramadan et al., 2022) and embodying the traits of a responsible leader (Liden et al., 2014). This leadership approach is characterized by acts of selflessness and empathy directed towards the common good (Gandolfi & Stone, 2018). The scholarly community has increasingly recognized the capacity of servant leadership to advance environmental sustainability, as evidenced by studies conducted by Luu (2019) and Tripathi et al. (2020).

Servant leadership places a strong emphasis on the well-being of employees and underscores the importance of aligning team objectives with the overarching goals of the organization. Concurrently, it emphasizes the provision of unwavering support to team members, fostering a collaborative and nurturing work environment (Abdelmotaleb et al., 2021; Karatepe et al., 2020). Furthermore, servant leaders exhibit key qualities such as empathy, accountability, and a steadfast commitment to the success and prosperity of their teams. They lead by example, demonstrating these attributes through their actions and inspiring their team members to emulate these values (Whittington, 2017). By embodying these characteristics, servant leaders not only promote a positive team dynamic but also cultivate a culture of mutual respect, cooperation, and shared success within the organization (Li et al., 2025; Zafar et al., 2025). Having said this, GSL significantly improves organizational environmental performance through promoting ecological responsibility and motivating sustainable practices among employees (Wang et al., 2018). In that sense, GSL has been incorporating environmental responsibility into leadership practices, as numerous scholars suggest (Ahmed et al., 2025; Patwary et al., 2023; Tuan, 2020).

Leaders who embrace GSL shows dedication towards sustainability, resource preservation, and addressing environmental challenges within their organizations (Afridi et al., 2021a; Luu, 2019). This perspective emphasizes the environmental health over individual gains or temporary accomplishments (Gandolfi & Stone, 2018).Some studies in the literature revealed that GSL substantially enhances environmental outcomes (Afridi et al., 2024; Han et al., 2025; Hou et al., 2023). As leaders who genuinely value sustainability inspires their workforce to adopt environmentally conscious behaviors (Li et al., 2020; Li et al., 2025). Through exemplary leadership, they promote resource conservation and waste reduction initiatives (Luu, 2019; Tuan, 2020; Zafar et al., 2025). Moreover, GSL was connected to tangible environmental improvements, including reduced ecological footprints and enhanced energy efficiency (Luu, 2020). By embedding environmental responsibility into organizational culture, servant leaders motivate teams toward achieving sustainability objectives (Mittal & Dhar, 2016).The integration of sustainability in leadership practices ensures alignment between business objectives and environmental considerations. Leaders foster an environment valuing sustainability, which encourages employee engagement in eco-friendly initiatives (Darvishmotevali & Altinay, 2022). This shared commitment enhances both environmental performance and operational sustainability. Furthermore, when employees observe leadership prioritizing sustainability, they develop stronger organizational commitment (Wang et al., 2018). This enhanced sense of purpose strengthens dedication to environmental initiatives, leading to improved outcomes. Based on this, the following hypothesis is proposed:

H1: GSL positively and directly influences ENVP

2. Green servant leadership and green organizational culture

Green organizational culture represents an emerging field in sustainability research, with limited studies addressing this concept. Recent studies in the literature suggest understanding this newly introduced concept through existing organizational culture frameworks (Gürlek & Tuna, 2018). The traditional conception of organizational culture encompasses shared values and beliefs that guide appropriate behaviors (Schein, 1992), whereas green organizational culture reflects environmental values and principles that shape organizational responses. The impact of GSL on GOC is deeply rooted in the Servant Leadership Theory. As servant leaders are deploying a service-oriented approach that enhances community wellbeing (Abdelmotaleb et al., 2021). This way of leadership transforms the way of managing others from an authoritative disciplining way into service-focused type. Unlike conventional leadership approaches who prioritize individual success, servant leadership emphasis stakeholder needs and collective advancement (Abdelmotaleb et al., 2021; Pawar et al., 2020).

This leadership philosophy has relevance in contemporary organizational contexts where sustainable management practices gain importance. The theory promotes trust-building and collaboration, encouraging employee participation in achieving organizational objectives. Through stewardship concept, servant leaders develop enduring relationships that inspire beneficial behaviors for the entire organization (Kauppila et al., 2022). GOC represents shared environmental values and behavioral standards within organizations. Green organizational culture is developed in a better way when servant leaders actively promote environmental responsibility, motivating employees to adopt sustainable practices. Studies demonstrate that when leadership consistently exhibits eco-friendly behaviors, employees tend to embrace environmentalism as fundamental organizational value (Zafar et al., 2020; Bivona & Scirè, 2024). In that sense, instead of making authoritative orders to implement environmentally friendly activities, GSL makes this become a norm in the place culture without imposing any new routine in the place. Having said this, servant leaders foster green attitudes through organizing sustainability focused activities in the workplace. This initiative might include environmental conservation programs and energy efficiency measures. Such actions help embed sustainability into organizational framework, establishing systems that reward eco-conscious behaviors (Pirzada et al., 2023). Finally, Ying et al. (2020) explained that environmental stewardship and servant leadership naturally aligns, as leaders inspire employees to maintain both organizational and personal environmental responsibility. This approach creates a culture where employees independently pursue green initiatives. Based on this, the following hypothesis is proposed:

H2: GSL positively and directly influences GOC

2.3 Green organizational culture and environmental performance

Many studies in the literature have reported that companies that have strong green organizational culture have evolved and created more innovative approaches to face almost all challenges that may affect their performance. Manufacturing companies with strong green organizational culture in the literature were faced by increased pressure to maintain sustainable practices, these pressures have encouraging employee’s alignment with environmental objectives (Chang & Lin, 2015). This cultural framework guides employee behaviors supporting sustainability commitments and enhanced the ENVP (Abdelfattah & Elfeky, 2021; Imran & Jingzu, 2022). Moreover, companies that have GOC aim to maximize the positive impacts of their work while minimizing harm to the environment (Roscoe et al., 2019; Sobaih et al., 2022a; 2022b). GOC was referred to by some studies in the literature as pro-environmental culture, sustainability culture, green consciousness, or eco-friendly culture.

Many studies in the literature have concentrated on the impact of GOC on ENVP. Some studies suggest that GOC had an influence on how companies perceive their environmental responsibilities, with employees playing a critical role in driving this transformation (Ayad et al., 2023; Hysing & Olsson, 2018; Roscoe et al., 2019). Wang (2019) explained that companies are more likely to adopt GOC if they have strong management principles and a genuine concern for environmental protection (Leonidou et al., 2015; Hasanein, 2024). When a company’s culture is rooted in environmental values, it becomes easier to engage in eco-friendly practices and develop sustainable products (Qu et al., 2022; Wang, 2019). In this way, GOC can serve as a powerful tool for translating environmental goals into tangible outcomes (Pham et al., 2018). However, it may seem a direct positive relationship, but companies must make tradeoff between their green initiatives and financial performance when addressing environmental challenges. As companies on the one hand, strive to achieve optimal performance, even if it means sacrificing some profits. On the other hand, they aim to maximize efficiency to increase profitability (Levinthal & Workiewicz, 2018). Without strong GOC, companies may struggle to allocate sufficient resources to their environmental strategies, even though these resources are essential for supporting eco-friendly actions. In such cases, the focus on maximizing profits often takes precedence. But for companies with a strong GOC, the pressure to improve environmental performance can become a catalyst for growth and innovation. This leads us to propose the following hypotheses:

H3: GOC positively and directly influences ENVP

H4: GOC has an indirect influence between GSL and ENVP

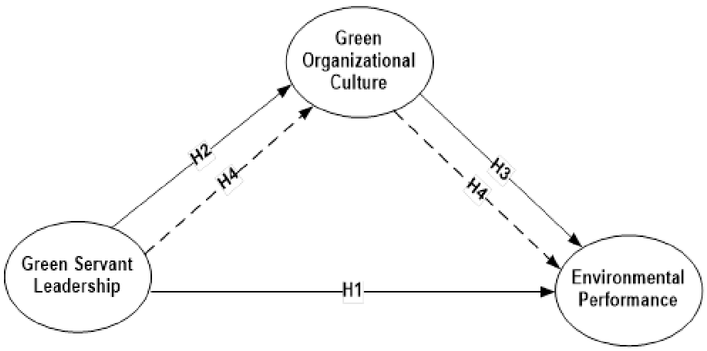

Figure 1. The Conceptual Framework of the Study

RESEARCH METHODOLOGY

The methodology of the study was conducted according to the following Figure 2.

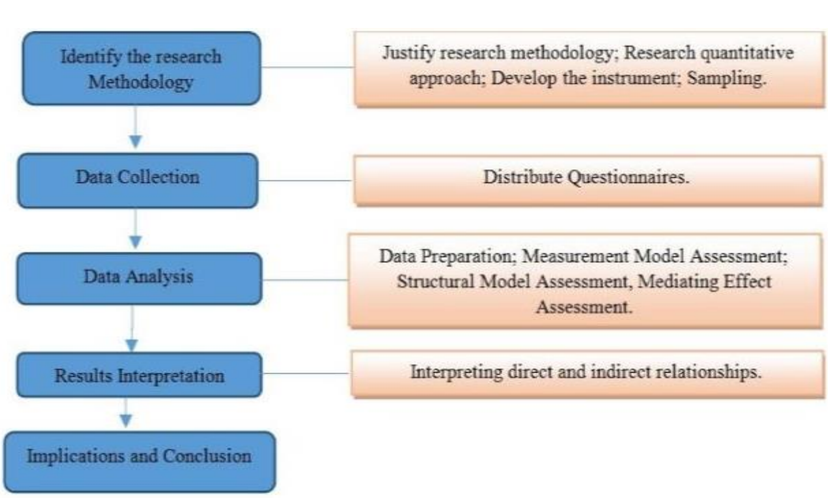

Figure 2. Research Methodology Flowchart

1. Development of measurement scales

The survey for the study was divided into three parts. The first portion included information about the study's objectives and survey completion instructions. Throughout the second section, information about the participants' demographic characteristics is given. In the third part of the research, other aspects were examined. A seven-point Likert scale was employed in the study, which 1 represents "strongly disagree" while 7 representing "strongly agree." Twelve items developed from Liden (2014) provided the green servant leadership (GSL) scale. Regarding green organizational culture (GOC) scale, five items were adopted from Marshall et al. (2015). Regarding environmental performance (ENVP) scale, five items were developed from Melnyk et al. (2003). Professionals in the hospitality enterprises (hotel experts and leaders) have reviewed the survey to make sure it is reliable and user-friendly. The survey's content validity was maintained by rewording and rearranging several statements in response to participant and academic feedback.

2. Procedures

This research mainly concentrates on the influence of GSL on GOC of employees as well as ENVP of Saudi Arabian hospitality enterprises. A purposive sampling technique was employed to target Saudi Arabian employees from the Eastern Region. Both Arabic and English versions of the study survey were accessible. The English translation of the survey was examined and confirmed by two bilingual experts. Twenty hospitality professionals were also asked to pilot the survey to ensure correct wording and pinpoint areas that needed improvement. After piloting, a few small language changes were made to better accommodate employees. The online survey was executed following the methodology of Hair et al. (2010).

After the instrument was developed, an online survey was created and carefully examined for accuracy and presentation before participants were given the link of e-survey. In addition to inviting employees to participate, the introduction described the study's purpose. Participants were briefed on the study's research goals and confidentiality. The introduction with the link of e-survey (English and Arabic) was distributed to employees who currently working in hotels located in Eastern Region via different social media accounts (LinkedIn, Facebook, X) . Every response was reviewed several times a day. In case anyone had any further questions, contact details (name, phone number, email address, and social media accounts) were provided to participants by the end of the introduction.

The objectives of the study were clearly disclosed to participants to guarantee the proper standards of ethical consideration. Participants were assured that their answers would remain anonymous, and they gave their verbal assent to the questionnaires utilized in the quantitative phase. The researchers leveraged networks, including relatives and coworkers, in identifying subjects. All of respondents agreed that gathering the data was done for research purposes and that their participation was completely voluntary. Data collection for the study took place over a duration of Three months, from December 2024 to February 2025. An overwhelming 84% of the 500 surveys that were distributed were successfully completed, with 420 of those surveys being finished. Furthermore, there was no missing data. The sample size of 420 valid responses was suitable considering Nunnally's (1994) requirements for maintaining a 1:10 item-to-sample ratio. It was discovered that 325 employees, or 77.3% of the 420 valid responses, identified as male, while 95 employees, or 22.7% of the employees, recognized as female. employees who were between the ages of 26 and 35 made up the biggest percentage of responses (66.3%), also 88.2% of the employees were well-knowledgeable about hotel green practices.

The data was examined using PLS-SEM, a variance-based technique for route analysis. Hair et al. (2017) stated that PLS-SEM offers an alternative to the traditional covariance-based SEM (CB-SEM). Henseler et al. (2009) claim that PLS-SEM has become more well-liked because of its application in exploratory and prediction-focused research. According to Hair et al. (2017) and Do Valle & Assaker (2016), it is not constrained by normality assumptions in the sampling distribution and performs well with both small and large sample sizes. Using SmartPLS-4.01, the PLS analysis was completed (Ringle et al., 2020). Furthermore, a study using Har-man's test was performed to lower common-method variance (CMV) in accordance with Podsakoff et al. (2003).

RESULTS

An exploratory factor analysis (EFA) of all 22 items revealed that only 29.8% of the variation could be explained by the first component. CMV is therefore not a significant problem in the current investigation. Additionally, since every Variance Inflation Factor (VIF) value is less than 5 (Table 1), there are no issues with multicollinearity. The analysis of the outer model included a review of the psychometric properties of multiple scales through specific criteria including Cronbach's α, Composite Reliability (CR), and Average-Variance-Extracted (AVE) (Table 1). Strong convergent validity is indicated by standardized factor loadings "λ" for each scale item, which are displayed above 0.7.

Table 1. Measurements and variables parametric attributes

Scale Variables	Λ	VIF
Green Servant Leadership: (α = 0.791, CR = 0.781, AVE = 0.843)		
GSL1	0.811	1.144
GSL2	0.783	2.809
GSL3	0.883	2.691
GSL4	0.822	1.153
GSL5	0.752	1.661
GSL6	0.831	1.785
GSL7	0.885	1.780
GSL8	0.841	1.056

GSL9	0.752	1.241
GSL10	0.936	1.131
GSL11	0.753	1.048
GSL12	0.943	1.035
Green Organizational Culture: (α = 0.853, CR = 0.726, AVE = 0.771)		
GOC1	0.874	1.047
GOC2	0.731	1.246
GOC3	0.813	1.067
GOC4	0.975	1.266
GOC5	0.859	1.807
Environmental Performance: (α = 0.943, CR = 0.843, AVE = 0.862)		
ENVP1	0.804	2.654
ENVP2	0.757	2.485
ENVP3	0.925	1.448
ENVP4	0.889	2.489
ENVP5	0.793	1.756

According to results in Table (2), each variable in the suggested model more well 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, as confirmed by Chin (1998), is highly supported by these findings.

Table 2. Fornell and Larcker Discriminant validity (*Bold ratios show the square root of AVE)

	GSL	**GOC**	**ENVP**
GSL	**0.798**		
GOC	0.512	**0.853**	
ENVP	0.483	0.390	**0.896**

Table 3. Direct and Indirect Path Coefficient

Paths	**Path Coefficient**	**T Value**	**P values**
Direct Effect			
[H1] GSL → ENVP.	0.597	4.604	0.000***
[H2] GSL → GOC.	0.717	15.366	0.000***
[H3] GOC → ENVP.	0.361	3.465	0.001***
Indirect Effect			
[H4] GSL → GOC → ENVP.	0.259	3.496	0.000***

As shown in Table (3) and Figure (3), the major findings supported that green servant leadership (GSL) is a pivotal factor for environmental performance (ENVP) ($\beta = 0.597$, T = 4.604, $p < 0.000$) and green organizational culture (GOC) ($\beta = 0.717$, T = 15.366, $p < 0.000$) which supporting H1 and H2.

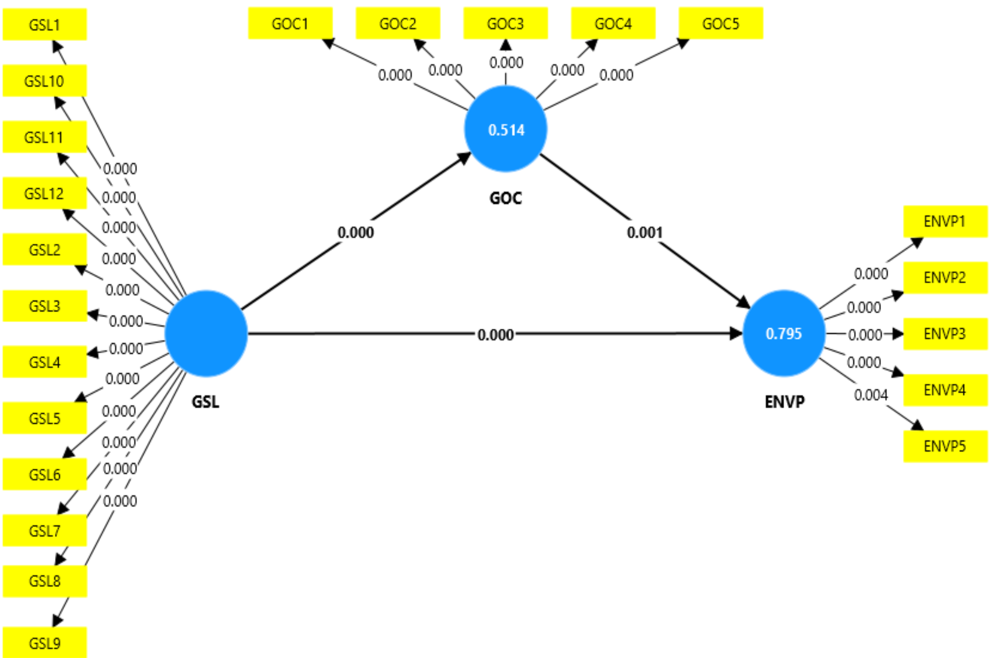

Figure 3. The Research final model

Moreover, GOC has a pivotal and significant influence on ENVP ($\beta = 0.361$, $T = 3.465$, $p < 0.001$) thus confirming H3. Examining the specific indirect effects that were bootstrapped revealed that GOC works as a partial mediator in the interactions between GSL and ENVP ($\beta = 0.259$, $T = 3.496$, $p < 0.000$) confirming H4. This partial mediation indicates that while GSL still has a direct influence on ENVP, this effect is at least partially justified by GOC. These findings emphasize the crucial function of GSL and GOC in verifying the ENVP in Saudi Arabian hospitality enterprises.

DISCUSSION AND CONCLUSION

The current study examined how GSL influences ENVP in Saudi Arabia's hospitality and tourism sector, paying particular attention to the role of GOC as a mediator. The findings confirmed a strong, positive relationship between GSL and ENVP, supporting the first hypothesis (H1). These results align with previous research (Afridi et al., 2024; Hou et al., 2023; Linuesa-Langreo et al., 2016; Vatankhah et al., 2024; Wang et al., 2018; Ying et al., 2020), reinforcing the idea that leadership approaches emphasizing environmental responsibility led to improved environmental outcomes. Leaders who adopt servant leadership qualities play a crucial role in fostering eco-conscious behaviors among employees, leading by example and driving sustainability initiatives such as resource conservation and waste reduction (Luu, 2019; 2020; Tuan, 2020). Additionally, the study supported the second hypothesis (H2), demonstrating that GSL has a significant positive effect on GOC. In the Saudi Arabian context, GSL emerged as a key factor in shaping an organizational culture centered around sustainability. These findings are consistent with earlier research showing that servant leaders drive environmentally responsible behavior by launching conservation initiatives, improving energy efficiency, and implementing waste reduction measures (Pirzada et al., 2023). By embedding sustainability into their organizational structures and cultivating an atmosphere where eco-friendly practices are both encouraged and rewarded, GSL helps establish long-term environmental values within companies (Ying et al., 2020).

The third hypothesis (H3) was also validated, with evidence confirming that GOC positively influences ENVP. This aligns with past studies emphasizing the importance of green organizational culture in promoting environmental collaboration and engagement with key stakeholders such as suppliers and customers (Hysing & Olsson, 2018; Roscoe et al., 2019). Research suggests that organizations with a well-established green culture are more likely to integrate sustainability into their operations, reinforcing eco-friendly behavior among employees and driving the development of sustainable products (Leonidou et al., 2015; Qu et al., 2022; Wang, 2019). When organizations foster a strong environmental ethos, they can effectively translate their sustainability goals into measurable outcomes (Pham et al., 2018). Furthermore, the study supported the fourth hypothesis (H4), showing that GOC serves as a partial mediator between GSL and ENVP. While GSL continues to have a direct impact on ENVP, part of this influence is channeled through the development of a strong green organizational culture. These results highlight the interconnected roles of leadership and culture in shaping environmental performance within Saudi Arabia's hospitality sector. The study also underscores the importance of considering contextual factors, as variations in cultural, regulatory, ethical, political, and behavioral environments across different regions can affect the success of sustainability efforts. Acknowledging these complexities is essential for designing leadership strategies that effectively enhance environmental performance.

Implications, limitations and future research directions

This study presents significant theoretical contributions through a framework discerning the interplay between GSL, GOC, and ENVP, specifically in the context of Saudi Arabia's hospitality and tourism industry. Finally, while the links that connect GSL with ENVP and GOC with ENVP have been studied in the past, this study extends these findings, demonstrating that GOC is part of what makes ENVP so vital. This study explores details related to both the direct effect of GOC and its moderating role, which helps towards a more comprehensive understanding of the role of leadership and organizational culture for sustainability. Practical implications for industry professionals — administrators, managers, and policymakers — can be drawn from the study's findings.

The results highlight the positive impact of GSL on ENVP, whereby leadership programs to enhance the ability of employees to improve the environmental performance of the organization is necessary. Companies should be built on policies that can create sustainability through having a system of environmental responsibility, through innovation, and execution. Additionally, the analysis shows that GOC acts as a mediator in the GSL–ENVP relationship, emphasizing the relevance of the incorporation of sustainability in organizational culture. Effective sustainability training informs employees about eco-friendly practices and involves them in a broader community commitment to environmental responsibility, translating into optimal results for all the stakeholders involved.

Despite these contributions, the study has some limitations. Since it relies on cross-sectional data, it cannot establish causality, making a strong case for future research to use longitudinal or panel data to capture how these relationships evolve over time. Cross-sectional research provides only a snapshot of variables at a given moment, which might not fully illustrate how GOC shapes organizational behavior in the long run. This limitation suggests that the true impact of GOC could be greater than what is currently observed. This research should be expanded on in new cultural and economic environments to improve the generalizability of these results. Using a mixed-methods approach — blending qualitative techniques like in-depth interviews with quantitative analysis — might yield a richer understanding of the causal dynamics at play between GSL, GOC, and ENVP. Also, exploring green innovation, regulatory influences, and sustainability HR management can further improve this conceptual model. A strong avenue of future research is possible within circular economic principles and sustainability challenges in SMEs, many aspects of which remain underexplored and could be discovered in relation to how environmental performance constructs itself in hospitality and tourism.

Author Contributions: Conceptualization, A.M., and A.H.; methodology, A.H; software, A.H; validation, A.H; formal analysis, A.M. and A.H; investigation, A.M. and A.H; data curation, A.M. and A.H; writing - original draft preparation, A.M. and A.H.; writing - review and editing, A.M. and A.H.; visualization, A.M. and A.H.; supervision, A.M.; project administration, A.H. All authors have read and agreed to the published version of the manuscript.

Funding: This work was funded by the Deanship of Scientific Research, Vice Presidency for Graduate Studies and Scientific Research, King Faisal University, Saudi Arabia [Project No. KFU250835].

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgements: This work was supported through the Deanship of Scientific Research, Vice Presidency for Graduate Studies and Scientific Research, King Faisal University, Saudi Arabia [Project No. KFU250835].

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Abdelfattah, T., & Elfeky, M. (2021). Earnings management, corporate social responsibility and governance structure: further evidence from Egypt. *International Journal of Accounting, Auditing and Performance Evaluation*, *17*(1-2), 173-201. https://doi.org/10.1504/IJAAPE.2021.117576

Abdelmotaleb, M., Metwally, A., & Saha, S. K. (2022). Servant leadership and nurses' upward voice behavior in an Egyptian hospital: Does prosocial motivation matter?. *Human Systems Management*, *41*(1), 47-58. https://doi.org/10.3233/HSM-201134

Abdelmotaleb, M., Mohamed Metwally, A. B. E., & Saha, S. K. (2018). Exploring the impact of being perceived as a socially responsible organization on employee creativity. *Management Decision*, *56*(11), 2325-2340. https://doi.org/10.1108/MD-06-2017-0552

Aboramadan, M., Hamid, Z., Kundi, Y. M., & El Hamalawi, E. (2022). The effect of servant leadership on employees' extra-role behaviors in NPOs: The role of work engagement. *Nonprofit Management and Leadership*, *33*(1), 109-129. https://doi.org/10.1002/nml.21505

Afolabi, H., Ram, R., Hussainey, K., Nandy, M., & Lodh, S. (2023). Exploration of small and medium entities' actions on sustainability practices and their implications for a greener economy. *Journal of Applied Accounting Research*, *24*(4), 655-681. https://doi.org/10.1108/JAAR-09-2022-0252

Afridi, S. A., Ali, S. Z., & Zahid, R. A. (2024). Nurturing environmental champions: Exploring the influence of environmental-specific servant leadership on environmental performance in the hospitality industry. *Environmental Science and Pollution Research*, *31*(34), 46281-46292. https://doi.org/10.1007/s11356-023-29690-4

Afsar, B., Cheema, S., & Javed, F. (2018). Activating employee's pro-environmental behaviors: The role of CSR, organizational identification, and environmentally specific servant leadership. *Corporate Social Responsibility and Environmental Management*, *25*(5), 904-911. https://doi.org/10.1002/csr.1506

Ahmad, I., Ullah, K., & Khan, A. (2022). The impact of green HRM on green creativity: mediating role of pro-environmental behaviors and moderating role of ethical leadership style. *The international journal of human resource management*, *33*(19), 3789-3821. https://doi.org/10.1080/09585192.2021.1931938

Ahmed, O., Javed, S., Azher, E., Jabbar, B., & Zafar, F. (2025). Leading the Green Revolution: How Transformational and Green Servant Leadership Drive Employee Sustainability in Hospitality and Tourism Industry. *Indus Journal of Social Sciences*, *3*(1), 420-445. https://doi.org/10.59075/ijss.

Ali, M. A. S., Aly, S. A. S., Abdelazim, S. I., & Metwally, A. B. M. (2024). Cash holdings, board governance characteristics, and Egyptian firms' performance. *Cogent Business & Management*, *11*(1), 2302205. https://doi.org/10.1080/23311975.2024.2302205

Aljoghaiman, A., Hasanein, A. M., Elshaer, I. A., & Sobaih, A. E. E. (2024). Does Environmental Performance Make Any Difference in the Relationship between Green Supply Chain Management and Hotel Competitiveness? *Logistics.* 2024; 8(3):70. https://doi.org/10.3390/logistics8030070

AL-Khatib, A. W., & Shuhaiber, A. (2022). Green intellectual capital and green supply chain performance: does big data analytics capabilities matter?. *Sustainability*, *14*(16), 10054. https://doi.org/10.3390/su141610054

Alnaim, M., & Metwally, A. B. M. (2024). Green Intellectual Capital and Corporate Environmental Performance: Does Environmental Management Accounting Matter?. *Administrative Sciences*, *14*(12), 311. https://doi.org/10.3390/admsci14120311

Alnaim, M., & Metwally, A. B. M. (2024). Institutional Pressures and Environmental Management Accounting Adoption: Do Environmental Strategy Matter?. *Sustainability*, *16*(7), 3020. https://doi.org/10.3390/su16073020

Asiaei, K., Bontis, N., Alizadeh, R., & Yaghoubi, M. (2022a). Green intellectual capital and environmental management accounting: Natural resource orchestration in favor of environmental performance. *Business Strategy and the Environment*, *31*(1), 76-93. https://doi.org/10.1002/bse.2875

Asiaei, K., Jusoh, R., Barani, O., & Asiaei, A. (2022b). How does green intellectual capital boost performance? The mediating role of environmental performance measurement systems. *Business Strategy and the Environment*, *31*(4), 1587-1606. https://doi.org/10.1002/bse.2971

Ayad, T. H., Hasanein, A., & Elsayed, R. M. (2023). The antecedence of pro-environmental behavior through green transformational leadership at hospitality sector: Organizational pride as a mediator. *African Journal of Hospitality, Tourism and Leisure*, *12*(4), 1512-1523. https://doi.org/10.46222/ajhtl.19770720.446.

Ayad, T., & Hasanein, A. M. (2024). How does spiritual leadership drive employee performance in the hospitality sector? Unraveling the role of affective commitment. *Geojournal of Tourism and Geosites*, *53*(2), 697-705.

Ayad, T., Hasanein, A., & Ghaly, M. (2024). The Antecedents Of Affective Commitment Through Cohesiveness Organizational Culture In The Hotel Industry: Job Satisfaction As A Mediator. *Geojournal of Tourism and Geosites*, *56*(4), 1773-1780.

Bassey, B. E., Effiok, S. O., & Eton, O. E. (2013). The impact of environmental accounting and reporting on organizational performance of selected oil and gas companies in Niger Delta Region of Nigeria. *Research Journal of finance and accounting*, *4*(3), 57-73.

Bavik, A. (2020). A systematic review of the servant leadership literature in management and hospitality. *International journal of contemporary Hospitality Management*, *32*(1), 347-382. https://doi.org/10.1108/IJCHM-10-2018-0788

Begum, S., Ashfaq, M., Xia, E., & Awan, U. (2022). Does green transformational leadership lead to green innovation? The role of green thinking and creative process engagement. *Business Strategy and the Environment*, *31*(1), 580-597. https://doi.org/10.1002/bse.2911

Bivona, E., & Scirè, G. (2024). Leveraging environmental, social and governance dimensions through the walking-to-talk pathway in SMEs: Findings from a longitudinal agri-food case study. *Piccola Impresa/Small Business*, (1). https://doi.org/10.14596/pisb.4192

Boso, R. K., Adusei, E., & Demah, E. (2022). How does green intellectual capital affect environmental performance? Evidence from manufacturing firms in Ghana. *Social Responsibility Journal*, *19*(7), 1178-1195. https://doi.org/10.1108/SRJ-12-2021-0503

Buhaya, M. I., & Metwally, A. B. M. (2024). Green intellectual capital and green supply chain performance: do external pressures matter?. *Cogent Business & Management*, *11*(1), 2349276. https://doi.org/10.1080/23311975.2024.2349276

Cai, W., & Li, G. (2018). The drivers of eco-innovation and its impact on performance: Evidence from China. *Journal of cleaner production*, *176*, 110-118. https://doi.org/10.1016/j.jclepro.2017.12.109

Chang, C. L. H., & Lin, T. C. (2015). The role of organizational culture in the knowledge management process. *Journal of Knowledge management*, *19*(3), 433-455. https://doi.org/10.1108/JKM-08-2014-0353

Channa, N. A., Hussain, T., Casali, G. L., Dakhan, S. A., & Aisha, R. (2021). Promoting environmental performance through corporate social responsibility in controversial industry sectors. *Environmental Science and Pollution Research*, *28*(18), 23273-23286. https://doi.org/10.1007/s11356-020-12326-2

Cheng, M. M., Perego, P., & Soderstrom, N. S. (2023). Sustainability and management accounting research. *Journal of Management Accounting Research*, *35*(3), 1-11. https://doi.org/10.2308/JMAR-2023-054

Chin, W. (1998). Commentary: Issues and opinion on structural equation modeling. JSTOR. https://www.jstor.org/stable/249674

Darvishmotevali, M., & Altinay, L. (2022). Toward pro-environmental performance in the hospitality industry: Empirical evidence on the mediating and interaction analysis. *Journal of Hospitality Marketing & Management*, *31*(4), 431-457. https://doi.org/10.1080/19368623.2022.2019650

Dey, M., Bhattacharjee, S., Mahmood, M., Uddin, M. A., & Biswas, S. R. (2022). Ethical leadership for better sustainable performance: Role of employee values, behavior and ethical climate. *Journal of Cleaner Production*, *337*, 130527. https://doi.org/10.1016/j.jclepro.2022.130527

Diab, A. A. A., & Mohamed Metwally, A. B. (2019). Institutional ambidexterity and management control: The role of religious, communal and political institutions. *Qualitative Research in Accounting & Management*, *16*(3), 373-402. https://doi.org/10.1108/QRAM-08-2017-0081

Diab, A., & Metwally, A. B. M. (2020). Institutional complexity and CSR practices: Evidence from a developing country. *Journal of Accounting in Emerging Economies*, *10*(4), 655-680. https://doi.org/10.1108/JAEE-11-2019-0214

Do Valle, P. O., & Assaker, G. (2016). Using Partial Least Squares Structural Equation Modeling in Tourism Research: A Review of Past Research and Recommendations for Future Applications. *Journal of Travel Research*, 55(6), 695–708. https://doi.org/10.1177/0047287515569779.

Faraz, N. A., Ahmed, F., Ying, M., & Mehmood, S. A. (2021). The interplay of green servant leadership, self‐efficacy, and intrinsic motivation in predicting employees' pro‐environmental behavior. *Corporate Social Responsibility and Environmental Management*, *28*(4), 1171-1184. https://doi.org/10.1002/csr.2115

Gandolfi, F., & Stone, S. (2018). Leadership, leadership styles, and servant leadership. *Journal of management research*, *18*(4), 261-269.

Greenleaf, R. (2007). The servant as leader. In *Corporate ethics and corporate governance*, 79-85, Berlin, Heidelberg: Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-540-70818-6_6

Gunarathne, A. N., Lee, K. H., & Hitigala Kaluarachchilage, P. K. (2021). Institutional pressures, environmental management strategy, and organizational performance: The role of environmental management accounting. *Business Strategy and the Environment*, *30*(2), 825-839. https://doi.org/10.1002/bse.2656

Gürlek, M., & Tuna, M. (2018). Reinforcing competitive advantage through green organizational culture and green innovation. *The service industries journal*, *38*(7-8), 467-491. https://doi.org/10.1080/02642069.2017.1402889

Hair, J., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2010). *Multivariate Data Analysis.* 6th (ed.) Upper Saddle River NJ. Prentice-Hall.

Hair., J., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: Updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, 1(2), 107. https://doi.org/10.1504/IJMDA.2017.087624.

Han, Y., Ren, W., & Tang, B. (2025). Research on the relationship between environmental servant leadership, employee environmental proactivity, employee environmental creativity and organizational environmental citizenship behavior. *WORK*, 0(0). https://doi.org/10.1177/10519815241298527

Hanif, S., Ahmed, A., & Younas, N. (2023). Examining the impact of environmental management accounting practices and green transformational leadership on corporate environmental performance: the mediating role of green process innovation. *Journal of Cleaner Production*, *414*, 137584. https://doi.org/10.1016/j.jclepro.2023.137584

Hasanein, A. M. (2024). Ethical leadership and pro-social behavior in the hospitality industry: Does social norms matter?. *Edelweiss Applied Science and Technology*, *8*(6), 3161-3170. https://doi.org/10.55214/25768484.v8i6.2678

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). *The use of partial least squares path modeling in international marketing*. In R. R. Sinkovics & P. N. Ghauri (Eds.), Advances in International Marketing, 20, 277–319, Emerald Group Publishing Limited. https://doi.org/10.1108/S1474-7979(2009)0000020014.

Hou, H., Gai, R., & An, L. (2023). The impact of environmentally-specific servant leadership on organizational green performance: The mediating role of green creativity. *Frontiers in Psychology*, *13*, 1091025. https://doi.org/10.3389/fpsyg.2022.1091025

Hysing, E., & Olsson, J. (2018). Green inside activism for sustainable development. *Green inside activism for sustainable development*. Springer.

Imran, M., & Jingzu, G. (2022). Green Organizational Culture, Organizational Performance, Green Innovation, Environmental Performance: A Mediation-Moderation Model. *Journal of Asia-Pacific Business*, 23(2), 161–182. https://doi.org/10.1080/10599231.2022.2072493

Imran, M., Arshad, I., & Ismail, F. (2021). Green organizational culture and organizational performance: The mediating role of green innovation and environmental performance. *Jurnal Pendidikan IPA Indonesia*, *10*(4), 515-530. https://doi.org/10.15294/jpii.v10i4.32386

Kang, A., Ren, L., Hua, C., Song, H., Dong, M., Fang, Z., & Zhu, M. (2021). Environmental management strategy in response to COVID-19 in China: Based on text mining of government open information. *Science of the Total Environment*, *769*, 145158. https://doi.org/10.1016/j.scitotenv.2021.145158

Karatepe, O. M., Aboramadan, M., & Dahleez, K. A. (2020). Does climate for creativity mediate the impact of servant leadership on management innovation and innovative behavior in the hotel industry?. *International Journal of Contemporary Hospitality Management*, *32*(8), 2497-2517. https://doi.org/10.1108/IJCHM-03-2020-0219

Kassim, C. K. H. C. K., Adnan, N. L., & Ali, R. (2021). Institutional pressures influencing environmental management accounting adoption by Malaysian local governments. *Journal of Accounting & Organizational Change*, *18*(3), 440-460. https://doi.org/10.1108/JAOC-11-2020-0183

Kauppila, O. P., Ehrnrooth, M., Mäkelä, K., Smale, A., Sumelius, J., & Vuorenmaa, H. (2022). Serving to help and helping to serve: Using servant leadership to influence beyond supervisory relationships. *Journal of Management*, *48*(3), 764-790. https://doi.org/10.1177/0149206321994173

Khan, M. K., Ali, S., Zahid, R. A., Huo, C., & Nazir, M. S. (2022). Does whipping tournament incentives spur CSR performance? An empirical evidence from Chinese sub-national institutional contingencies. *Frontiers in psychology*, *13*, 841163. https://doi.org/10.3389/fpsyg.2022.841163

Khan, S. A. R., Yu, Z., Sharif, A., & Golpîra, H. (2020). Determinants of economic growth and environmental sustainability in South Asian Association for Regional Cooperation: evidence from panel ARDL. *Environmental Science and Pollution Research*, *27*, 45675-45687. https://doi.org/10.1007/s11356-020-10410-1

Leonidou, L. C., Fotiadis, T. A., Christodoulides, P., Spyropoulou, S., & Katsikeas, C. S. (2015). Environmentally friendly export business strategy: Its determinants and effects on competitive advantage and performance. *International Business Review*, *24*(5), 798-811. https://doi.org/10.1016/j.ibusrev.2015.02.001

Levinthal, D. A., & Workiewicz, M. (2018). When two bosses are better than one: Nearly decomposable systems and organizational adaptation. *Organization Science*, *29*(2), 207-224. https://doi.org/10.1287/orsc.2017.1177

Li, J., Gao, Z., li, X., & Xing, B. (2025). Effect of green organizational culture on employee green organizational commitment: a moderated—mediated model of employee green self-efficacy and organizational identity. *Discover Sustainability*, *6*(1), 223. https://doi.org/10.1007/s43621-025-00875-w

Li, L., Wu, B., & Patwary, A. K. (2022). RETRACTED ARTICLE: How marine tourism promote financial development in sustainable economy: new evidences from South Asia and implications to future tourism students. *Environmental Science and Pollution Research*, *29*(1), 1155-1172. https://doi.org/10.1007/s11356-021-15709-1

Liden, R. C., Wayne, S. J., Liao, C., & Meuser, J. D. (2014). Servant leadership and serving culture: Influence on individual and unit performance. *Academy of management journal*, *57*(5), 1434-1452. https://doi.org/10.5465/amj.2013.0034

Linuesa-Langreo, J., Ruiz-Palomino, P., & Elche, D. (2016). Servant leadership, empowerment climate, and group creativity_ a case study in the hospitality industry. *Ramon Llull Journal of Applied Ethics*, (7), 9-36. https://raco.cat/index.php/rljae/article/view/310233

Liu, Z., Lan, J., Chien, F., Sadiq, M., & Nawaz, M. A. (2022). Role of tourism development in environmental degradation: A step towards emission reduction. *Journal of Environmental Management*, *303*, 114078. https://doi.org/10.1016/j.jenvman.2021.114078

Luu, T. T. (2019). Building employees' organizational citizenship behavior for the environment: The role of environmentally-specific servant leadership and a moderated mediation mechanism. *International Journal of Contemporary Hospitality Management*, *31*(1), 406-426. https://doi.org/10.1108/IJCHM-07-2017-0425

Luu, T. T. (2023). Can green creativity be fostered? Unfolding the roles of perceived green human resource management practices, dual mediation paths, and perceived environmentally-specific authentic leadership. *The International Journal of Human Resource Management*, *34*(6), 1246-1273. https://doi.org/10.1080/09585192.2021.1986107

Mandago, R. J. (2018). Influence of green reward and compensation practice on environmental sustainability in selected service based state corporations in Kenya. *European Journal of Business and Strategic Management*, *3*(6), 1-12.

Mansoor, A., Jahan, S., & Riaz, M. (2021). Does green intellectual capital spur corporate environmental performance through green workforce?. *Journal of Intellectual Capital*, *22*(5), 823-839. https://doi.org/10.1108/JIC-06-2020-0181

Marshall, D., McCarthy, L., McGrath, P., & Claudy, M. (2015). Going above and beyond: How sustainability culture and entrepreneurial orientation drive social sustainability supply chain practice adoption (world). https://doi.org/10.1108/SCM-08-2014-0267.

Melnyk, S. A., Sroufe, R. P., & Calantone, R. (2003). Assessing the impact of environmental management systems on corporate and environmental performance. *Journal of Operations Management*, 21(3), 329–351. https://doi.org/10.1016/S0272-6963(02)00109-2.

Metwally, A. B. M., & Diab, A. (2021). Risk-based management control resistance in a context of institutional complexity: evidence from an emerging economy. *Journal of Accounting & Organizational Change*, *17*(3), 416-435. https://doi.org/10.1108/JAOC-04-2020-0039

Metwally, A. B. M., Aly, S. A. S., & Ali, M. A. S. (2024). The Impact of Corporate Social Responsibility on Cash Holdings: The Moderating Role of Board Gender Diversity. *International Journal of Financial Studies*, *12*(4), 104. https://doi.org/10.3390/ijfs12040104

Metwally, A. B. M., Diab, A., & Mohamed, M. K. (2022). Telework operationalization through internal CSR, governmentality and accountability during the Covid-19: evidence from a developing country. *International Journal of Organizational Analysis*, *30*(6), 1441-1464. https://doi.org/10.1108/IJOA-11-2020-2500

Mittal, S., & Dhar, R. L. (2016). Effect of green transformational leadership on green creativity: A study of tourist hotels. *Tourism management*, *57*, 118-127. https://doi.org/10.1016/j.tourman.2016.05.007

Newman, A., Schwarz, G., Cooper, B., & Sendjaya, S. (2017). How servant leadership influences organizational citizenship behavior: The roles of LMX, empowerment, and proactive personality. *Journal of business ethics*, *145*, 49-62. https://doi.org/10.1007/s10551-015-2827-6

Nunnally, J., & Bernstein, I. (1994). Psychometric theory McGraw-hill series (3rd ed.). Psychology.

Omarova, L., & Jo, S. J. (2022). Employee pro-environmental behavior: The impact of environmental transformational leadership and GHRM. *Sustainability*, *14*(4), 2046. https://doi.org/10.3390/su14042046

Patwary, A. K. (2023). Examining environmentally responsible behaviour, environmental beliefs and conservation commitment of tourists: a path towards responsible consumption and production in tourism. *Environmental Science and Pollution Research*, *30*(3), 5815-5824. https://doi.org/10.1007/s11356-022-22577-w

Patwary, A. K., Aziz, R. C., & Hashim, N. A. A. N. (2023). Investigating tourists' intention toward green hotels in Malaysia: a direction on tourist sustainable consumption. *Environmental Science and Pollution Research*, *30*(13), 38500-38511. https://doi.org/10.1007/s11356-022-24946-x

Pawar, A., Sudan, K., Satini, S., & Sunarsi, D. (2020). Organizational servant leadership. *International Journal of Educational Administration, Management, and Leadership*, 63-76. https://doi.org/10.51629/ijeamal.v1i2.8

Pirzada, M. J. U., Shah, S. M. A., Merani, S. H., & Khan, M. (2023). Effect of ethical leadership and ethical climate on corporate social responsibility and firm performance: a mediated model. *Middle East Journal of Management*, *10*(4), 408-424. https://doi.org/10.1504/MEJM.2023.131947

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Ren, S., Tang, G., & Jackson, S. E. (2021). Effects of Green HRM and CEO ethical leadership on organizations' environmental performance. *International Journal of Manpower*, *42*(6), 961-983. https://doi.org/10.1108/IJM-09-2019-0414

Ringle, C. M., Sarstedt, M., Mitchell, R., & Gudergan, S. P. (2020). Partial least squares structural equation modeling in HRM research. *The International Journal of Human Resource Management*, 31(12), 1617–1643. https://doi.org/10.1080/09585192.2017.1416655.

Riva, F., Magrizos, S., & Rubel, M. R. B. (2021). Investigating the link between managers' green knowledge and leadership style, and their firms' environmental performance: The mediation role of green creativity. *Business Strategy and the Environment*, *30*(7), 3228-3240. https://doi.org/10.1002/bse.2799

Robertson, J. L., & Barling, J. (2017). Contrasting the nature and effects of environmentally specific and general transformational leadership. *Leadership & Organization Development Journal*, *38*(1), 22-41. https://doi.org/10.1108/LODJ-05-2015-0100

Roscoe, S., Subramanian, N., Jabbour, C. J., & Chong, T. (2019). Green human resource management and the enablers of green organisational culture: Enhancing a firm's environmental performance for sustainable development. *Business Strategy and the Environment*, *28*(5), 737-749. https://doi.org/10.1002/bse.2277

Sari, R. N., Pratadina, A., Anugerah, R., Kamaliah, K., & Sanusi, Z. M. (2021). Effect of environmental management accounting practices on organizational performance: role of process innovation as a mediating variable. *Business Process Management Journal*, *27*(4), 1296-1314. https://doi.org/10.1108/BPMJ-06-2020-0264

Saxena, G., Purchase, D., Mulla, S. I., Saratale, G. D., & Bharagava, R. N. (2020). Phytoremediation of heavy metal-contaminated sites: eco-environmental concerns, field studies, sustainability issues, and future prospects. *Reviews of Environmental Contamination and Toxicology Volume 249*, 71-131. https://doi.org/10.1007/398_2019_24

Schein, E. H. (1992). How can organizations learn faster?: the problem of entering the Green Room.

Sheikh, A. M. (2022). Green intellectual capital and social innovation: the nexus. *Journal of Intellectual Capital*, *23*(6), 1199-1220. https://doi.org/10.1108/JIC-11-2020-0361

Sial, M. S., Chunmei, Z., Khan, T., & Nguyen, V. K. (2018). Corporate social responsibility, firm performance and the moderating effect of earnings management in Chinese firms. *Asia-Pacific Journal of Business Administration*, *10*(2/3), 184-199. https://doi.org/10.1108/APJBA-03-2018-0051

Singh, S. K., Del Giudice, M., Chierici, R., & Graziano, D. (2020). Green innovation and environmental performance: The role of green transformational leadership and green human resource management. *Technological forecasting and social change*, *150*, 119762. https://doi.org/10.1016/j.techfore.2019.119762

Sobaih, A. E. E., Gharbi, H., Hasanein, A. M., & Elnasr, A. E. A. (2022a). The mediating effects of green innovation and corporate social responsibility on the link between transformational leadership and performance: An examination using SEM analysis. *Mathematics*, *10*(15), 2685.https://doi.org/10.3390/math10152685

Sobaih, A. E. E., Hasanein, A., Gharbi, H., & Abu Elnasr, A. E. (2022b). Going green together: effects of green transformational leadership on employee green behaviour and environmental performance in the Saudi food industry. *Agriculture*, *12*(8), 1100.https://doi.org/10.3390/agriculture12081100

Sun, Y., Duru, O. A., Razzaq, A., & Dinca, M. S. (2021). The asymmetric effect eco-innovation and tourism towards carbon neutrality target in Turkey. *Journal of Environmental Management*, *299*, 113653. https://doi.org/10.1016/j.jenvman.2021.113653

Tang, M., Walsh, G., Lerner, D., Fitza, M. A., & Li, Q. (2018). Green innovation, managerial concern and firm performance: An empirical study. *Business strategy and the Environment*, *27*(1), 39-51. https://doi.org/10.1002/bse.1981

Tosun, C., Parvez, M. O., Bilim, Y., & Yu, L. (2022). Effects of green transformational leadership on green performance of employees via the mediating role of corporate social responsibility: Reflection from North Cyprus. *International Journal of Hospitality Management*, *103*, 103218. https://doi.org/10.1016/j.ijhm.2022.103218

Tripathi, D., Priyadarshi, P., Kumar, P., & Kumar, S. (2020). Does servant leadership affect work role performance via knowledge sharing and psychological empowerment? *VINE Journal of Information and Knowledge Management Systems*, *51*(5), 792-812. https://doi.org/10.1108/VJIKMS-10-2019-0159

Tuan, L. T. (2020). Environmentally-specific servant leadership and green creativity among tourism employees: Dual mediation paths. *Journal of Sustainable Tourism*, *28*(1), 86-109. https://doi.org/10.1080/09669582.2019.1675674

Vatankhah, S., Fejes, O. F., Karatepe, O. M., & Nosrati, S. (2024). Fly green: environmentally specific servant leadership and its impact on green performance outcomes. *Current Issues in Tourism*, *27*(24), 4594-4609. https://doi.org/10.1080/13683500.2023.2288664

Wang, Z., Xu, H., & Liu, Y. (2018). Servant leadership as a driver of employee service performance: Test of a trickle-down model and its boundary conditions. *Human Relations*, *71*(9), 1179-1203. https://doi.org/10.1177/0018726717738320

Whittington, J. L. (2017). Creating a positive organization through servant leadership. *Servant Leadership and Followership: Examining the Impact on Workplace Behavior*, 51-79. https://doi.org/10.1007/978-3-319-59366-1_3

Xuecheng, W., & Iqbal, Q. (2022). Ethical leadership, bricolage, and eco-innovation in the Chinese manufacturing industry: a multi-theory perspective. *Sustainability*, *14*(12), 7070. https://doi.org/10.3390/su14127070

Xuecheng, W., Ahmad, N. H., Iqbal, Q., & Saina, B. (2022). Responsible leadership and sustainable development in east asia economic group: application of social exchange theory. *Sustainability*, *14*(10), 6020. https://doi.org/10.3390/su14106020

Ying, M., Faraz, N. A., Ahmed, F., & Raza, A. (2020). How does servant leadership foster employees' voluntary green behavior? A sequential mediation model. *International journal of environmental research and public health*, 17(5), 1792. https://doi.org/10.3390/ijerph17051792

Ying, M., Faraz, N. A., Ahmed, F., & Raza, A. (2020). How does servant leadership foster employees' voluntary green behavior? A sequential mediation model. *International journal of environmental research and public health*, *17*(5), 1792. https://doi.org/10.3390/ijerph17051792

Yu, W., Chavez, R., Feng, M., Wong, C. Y., & Fynes, B. (2020). Green human resource management and environmental cooperation: An ability-motivation-opportunity and contingency perspective. *International journal of production economics*, *219*, 224-235. https://doi.org/10.1016/j.ijpe.2019.06.013

Zafar, H., Cheah, J. H., Ho, J. A., Suseno, Y., & Tian, F. (2025). How green servant leadership influences organizational green performance? The roles of employee green creativity, voluntary pro-environmental behavior and green psychological climate. *Personnel Review*. https://doi.org/10.1108/PR-10-2023-0843.

Zafar, H., Tian, F., Ho, J. A., & Zhang, G. (2022). Environmentally specific servant leadership and voluntary pro-environmental behavior in the context of green operations: A serial mediation path. *Frontiers in psychology*, *13*, 1059523. https://doi.org/10.3389/fpsyg.2022.1059523

Article history: Received: 27.02.2025 Revised: 22.05.2025 Accepted: 16.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1254-1265
DOI 10.30892/gtg.602spl22-1498

THE RISE OF AI IN TOURISM - A SYSTEMATIC LITERATURE REVIEW

Ferenc ERDŐS[1], Rajermani THINAKARAN[2], Bayboboeva FIRUZA[3], László KOLOSZÁR[4*]

[1]Széchenyi István University, Faculty of Mechanical Engineering, Informatics and Electrical Engineering, Department of Informatics, Győr, Hungary; erdosf@sze.hu (F.E.)
[2]INTI International University, Faculty of Data Science and Information Technology, Nilai, Malaysia; rajermani.thina@newinti.edu.my (R.T.)
[3]Tashkent State University of Economics, Department of Economical and Financial Security, Tashkent, Uzbekistan; firuzanabijonovna@mail.ru (B.F.)
[4]University of Sopron, Alexandre Lamfalussy Faculty of Economics, Sopron, Hungary; koloszar.laszlo@uni-sopron.hu (L.K.)

Citation: Erdős, F., Thinakaran, R., Firuza, B., & Koloszár, L. (2025). The rise of ai in tourism - A systematic literature review. *Geojournal of Tourism and Geosites*, 60(2spl), 1254–1265. https://doi.org/10.30892/gtg.602spl22-1498

Abstract: Tourism ranks among the world's largest industries, and its sustained expansion has paralleled swift advancements in technology. Artificial Intelligence (AI) is increasingly recognized as a transformative force in tourism, offering human-like capabilities that enhance decision-making and service automation. Its application across the sector improves operational efficiency and personalizes customer experiences, thereby fostering innovation and competitiveness. However, the rapid integration of AI also presents conceptual, theoretical, and societal challenges that require critical examination. The research aims to synthesize the conceptual and theoretical research on AI in tourism from 2019 onwards. It examines key themes, theoretical perspectives, methodological rigor, and research gaps in the existing literature. Further goal is to identify thematic areas with a specific focus on AI applications. The study followed the PRISMA guidelines to conduct a systematic literature review (SLR). Academic databases, including Scopus and Web of Science, were searched to identify scientific-relevant peer-reviewed articles. From an initial pool of over 400 studies, we identified 45 significant journal articles and selected them for an in-depth analysis, that collectively illuminate how AI is reshaping tourism research and practice. Studies have drawn on innovation diffusion theory to explain adoption patterns, technology acceptance models to gauge user and employee attitudes, and service quality and co-creation theories to understand how AI can add value to the customer experience. It also highlighted the evolution of AI research in tourism, from conceptual discussions to empirical investigations. Gaps and challenges in the research were identified, including a limited focus on human-AI interaction, ethical concerns, and methodological rigor. The review concludes that AI has the potential to transform tourism by enhancing efficiency, personalization, and sustainability. The findings reveal that AI has been envisioned as a catalyst for transformation in the tourism industry, with applications ranging from intelligent forecasting and revenue management to service automation via robots and hyper-personalized travel experiences. AI-driven analytics can improve decision support for revenue management, capacity planning, and marketing strategy. However, realizing this potential requires addressing the improvement of technological competence of human resources, ethical issues, and implementation strategies.

Keywords: artificial intelligence, tourism, hospitality, systematic literature review, automation, personalization, smart tourism, sustainability, human-ai interaction

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INTRODUCTION

Tourism is one of the largest global industries, and its continued growth has been accompanied by rapid technological development. Artificial Intelligence (AI) has emerged as a transformative technology in tourism, offering tools with human-like capabilities (e.g. sensing, learning, reasoning, and acting) that can augment decision-making and automate services. By applying AI across various tourism domains, businesses can increase efficiency through better resource use and deliver more personalized customer experiences. In recent years, the integration of AI in tourism has accelerated, enabling innovations from AI-powered chatbots and recommender systems to service robots and smart destination management. These developments underscore AI's significance for enhancing competitiveness and innovation in hospitality and tourism services. However, the rapid proliferation of AI also raises complex questions regarding its conceptual role, the theoretical frameworks guiding its adoption, and broader impacts on consumers, businesses, and society.

Given the burgeoning but fragmented body of literature, a systematic review is needed to synthesize how AI has been studied in tourism from a conceptual and theoretical standpoint. Existing studies range from comprehensive literature reviews to perspective articles and frameworks that attempt to assess AI's transformative impact on tourism. There is a need to consolidate these insights to understand prevailing themes, theoretical lenses, and research gaps. This review addresses that need by conducting a Systematic Literature Review (SLR) of peer-reviewed research on AI in tourism since 2019, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The objectives of this review are to: (1) examine the key conceptual themes in the literature on AI's role in tourism; (2) identify

* Corresponding author

the theoretical perspectives and frameworks applied; (3) evaluate methodological rigor in these studies; and (4) highlight research trends and gaps to inform future investigations. By focusing on conceptual, theoretical, and methodological discussions (and excluding narrow case-specific implementations), this SLR provides a rigorous synthesis of how AI is understood and studied in tourism globally. The following sections present the literature review of key themes, the methodology and PRISMA-based process, discussion of findings and gaps, and conclusions with future research directions.

METHODOLOGY

This systematic literature review was conducted in accordance with the PRISMA 2009/2020 guidelines for transparent and comprehensive reporting. The review followed the four-phase PRISMA flow: **Identification**, **Screening**, **Eligibility**, and **Inclusion**. The process is outlined below. **Identification:** We defined a search strategy to capture relevant literature from 2019 onward, focusing on peer-reviewed journal articles that discuss AI in a tourism context at a conceptual or theoretical level (rather than purely applied case studies) focusing on Business, Management and Accounting category. We searched multiple academic databases – primarily **Scopus** and **Web of Science (WoS)** – given their broad coverage of high-quality journals. Additional searches were run on **ScienceDirect**, **SpringerLink**, and **Google Scholar** to ensure comprehensive coverage, especially for recent publications and any journals not indexed in Scopus/WoS. Search strings combined keywords related to artificial intelligence with tourism/hospitality/travel, for example: *'artificial intelligence' AND (tourism OR hospitality OR travel)*. The initial search (conducted in 01/2025) yielded a total of **N_1 = 627** records (after removing clearly irrelevant results such as those outside tourism or AI domains).

Screening: All identified records were exported into reference management software, where **duplicate removal** was performed. After de-duplication, **N_2 = 421** unique records remained. We then screened titles and abstracts against inclusion criteria. The inclusion criteria were: (a) written in English; (b) published in a peer-reviewed journal (to ensure quality and consistency); (c) published 2019 or later; (d) explicitly focused on AI (or closely related concepts like machine learning, intelligent systems, robotics, etc.) *in a tourism, hospitality, or travel context*; and (e) discussing AI from a conceptual, theoretical, or broad methodological perspective (as opposed to reporting a single-case empirical application or technical algorithm details unrelated to tourism theory). We **excluded** papers that were: conference proceedings, theses, or other non-peer-reviewed sources; not in English; or clearly off-topic (e.g. AI applied in unrelated fields with a passing mention of 'tourism'). We also excluded papers that were primarily **case studies or empirical implementations of a specific AI system in one company**, as per the review's focus on generalizable concepts and frameworks. For example, an empirical study on AI-driven guest satisfaction in one hotel chain (Al-Hyari et al., 2023, on luxury hotels) was excluded during screening because it centered on a specific case context rather than deriving broader conceptual insights. After the title/abstract screening, N_3 = 141 articles were deemed potentially eligible and moved to full-text assessment.

Eligibility: In the eligibility phase, we retrieved and read the full texts of these 141 articles to confirm their relevance and quality. Each article was assessed on: relevance to AI in tourism (Does the full text indeed discuss AI's role in tourism?); conceptual depth (Does it provide theoretical discussion or a literature synthesis rather than just a technical implementation?); and methodological rigor (For reviews, did they follow a clear method?; For conceptual papers, is the argumentation well-supported?). At this stage, we further excluded studies that, upon full reading, did not substantially engage with AI in a tourism context (for instance, a few papers turned out to be only tangentially related, using 'tourism' examples but focusing on AI algorithm performance, etc.), or that lacked any clear methodological or theoretical grounding. We also scrutinized review papers to ensure they had a systematic approach (where applicable). By the end of this eligibility check, **N_4 = 45** studies met all criteria. **Inclusion:** The final set of included studies for analysis numbered **45**. These comprised a mix of article types: approximately one-third were **systematic or structured literature reviews** of AI in tourism (or subtopics thereof), another one-third were **conceptual/theoretical papers or viewpoints** proposing frameworks or discussing trends, and the remainder were **broad empirical studies or meta-analyses** whose findings had conceptual implications (e.g. bibliometric studies, meta-studies of multiple papers). Notably, the included literature spanned a **global range** of research, with studies originating from Europe, Asia, North America, and beyond, reflecting the international scope of AI in tourism research. All included papers were published in English-language journals. Figure 1 illustrates the PRISMA flow of study selection (from 627 initial records to 45 included articles), detailing the numbers removed at each stage for reasons such as duplication, irrelevance, or not meeting inclusion criteria.

During data extraction, we catalogued each included study's bibliographic details, research objectives, methodology, and key conclusions. To facilitate analysis, we coded the studies by theme (as identified in the Literature Review section) and noted any theoretical frameworks used. We also recorded publication venues and dates to observe temporal and journal distribution of the research. The final sample was drawn from over 30 different journals, indicating a diverse set of outlets. A significant portion of the literature appeared in high-impact tourism and hospitality journals. For instance, we found multiple relevant articles in *International Journal of Contemporary Hospitality Management*, *International Journal of Hospitality Management*, *GeoJournal of Tourism and Geosites*, *Journal of Hospitality & Tourism Technology*, *Tourism Review*, and others, which together accounted for a large share of the included studies (over 50%). This distribution aligns with a recent analysis by Henriques et al. (2024), who noted that the top outlets for AI-tourism research include leading hospitality management journals. The diversity of sources enhances the robustness of our review, and we ensured via multiple independent searches that key contributions were not missed. To ensure methodological rigor, the review protocol (search strategy, inclusion criteria, etc.) was defined a priori and, where applicable, this report follows PRISMA reporting standards (e.g. describing information sources, selection process, data synthesis). By strictly adhering to these procedures, we aim to provide a transparent and replicable account of how the literature was gathered and analyzed.

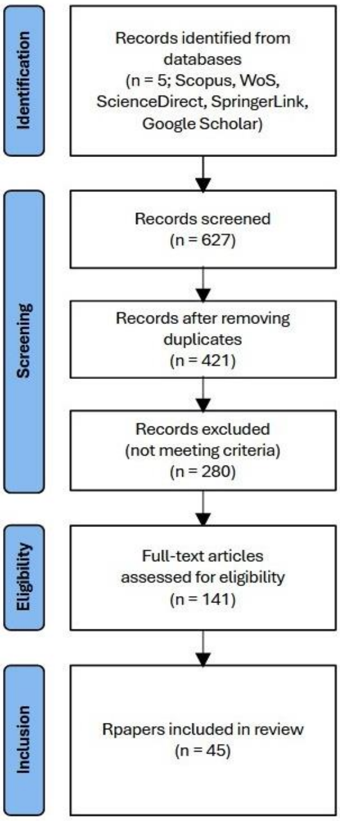

Figure 1. PRISMA 4-phase flow diagram of the literature selection process (Source: own construction)

RESULTS OF THE SYSTEMATIC LITERATURE REVIEW

Research on AI in tourism has grown markedly in the past decade, yielding several recurring themes and conceptual perspectives. The reviewed studies (2019–2024) predominantly discuss AI's applications in **demand forecasting and analytics**, **service automation and robotics**, **customer experience personalization**, **marketing and consumer engagement**, and **smart tourism and sustainability**. Across these themes, scholars have also considered issues of technology adoption, user trust, and ethical implications. Below, we summarize each theme and the theoretical insights from representative studies (also Table 1 for an overview of thematic categories).

AI for Forecasting and Analytics

One fundamental application of AI in tourism is improving forecasting accuracy for demand and market trends. Early uses of AI in the sector were in predicting tourism demand and hotel occupancy. Traditional statistical methods for tourism forecasting are increasingly augmented or replaced by machine learning models that can handle large, complex datasets. For instance, Song et al. (2019) review decades of tourism demand forecasting research and note the **emergence and success of AI-based models** in improving forecast accuracy. Similarly, Liu et al. (2019) conduct a scientometric analysis and find a surge in the use of AI (e.g. neural networks, support vector machines) for tourism forecasting since around 2009. A recurring insight is that AI models can detect nonlinear patterns and leverage big data (such as online search queries or social media metrics) to enhance predictions. However, these studies also caution about challenges like the 'black box' nature of some AI algorithms and the need for large datasets for training. Jiao & Chen (2019) specifically review methodological developments in tourism forecasting over the 2008–2017 period and highlight how AI techniques (e.g. ensemble learning, hybrid models) have expanded forecasting capabilities, albeit with issues in interpretability and computational demand. Recent advancements continue to refine forecasting methodologies by integrating sophisticated AI-driven hybrid models. Hu et al. (2024) developed a **two-stage combination model** for tourism demand forecasting, blending **data decomposition techniques** with machine learning algorithms such as **support vector regression** and **extreme learning machines**. Their approach enhances prediction accuracy by capturing both **seasonal** and **nonlinear dynamics**, outperforming traditional single-model methods in empirical testing.

However, while the model shows strong robustness across different forecasting horizons, a critical limitation is its **high computational complexity**, which may hinder adoption among smaller tourism enterprises with limited technological infrastructure. Moreover, the study's evaluation relies heavily on **benchmark datasets**, and real-world operational validation under diverse market conditions remains an area for future research.

In a complementary approach, Liao et al. (2024) propose the **SARIMAX-helpful model**, which integrates **sentiment analysis** and the **helpfulness ratings** of user-generated online reviews to enhance short-term tourism demand forecasts. Their findings demonstrate that incorporating the **perceived usefulness** of reviews significantly boosts model performance, especially in volatile demand environments. Nevertheless, the approach is sensitive to **regional disparities** in digital engagement and **platform-specific biases**, potentially affecting its generalizability. Additionally, the study primarily focuses on a single data source (Meituan reviews in China), which may limit the applicability of findings to broader, multilingual, and multi-platform tourism markets, suggesting the need for cross-platform validations in future studies.

Overall, the literature establishes **forecasting** as a key conceptual domain for AI in tourism, demonstrating that AI-driven analytics can improve decision support for revenue management, capacity planning, and marketing strategy. This theme often intersects with the next one, as forecasting improvements contributes to operational efficiency in tourism services.

AI-Driven Service Automation and Robotics

Another dominant theme is the use of AI to automate tourism and hospitality operations, often via robotics and intelligent systems. The concept of service automation in tourism gained traction with the advent of **social robots, chatbots, and autonomous service kiosks** in hotels, airports, and tourist attractions.

Ivanov et al. (2019) provide a comprehensive review of progress in hospitality robotics, documenting deployments of robots as hotel receptionists, restaurant servers, concierges, and tour guides. Their review (and similar work by Cain et al., 2019) illustrates that what was once 'science fiction' is becoming 'sci-fact', as AI-powered robots increasingly handle customer-facing tasks in the industry. These studies discuss potential efficiency gains – robots can work 24/7, reduce human error, and perform repetitive tasks – as well as consistency in service delivery.

Conceptually, the literature frames robotics and automation as part of the broader digital transformation of tourism. Tussyadiah (2020) in an editorial overview notes that automation in tourism spans not just physical robots but also algorithmic processes that automate information provision and transactions. For example, AI-driven **self-service kiosks** and **automated check-in systems** use computer vision and natural language processing to replace traditional human staff at airports and hotels, streamlining operations. Several theoretical perspectives emerge in this theme: one is **technology acceptance**, as researchers note that the success of service automation depends on customer readiness and comfort with AI. Cain et al. (2019) emphasize that understanding customers' willingness to accept and engage with robotic services is *vital* for their effective adoption. This aligns with technology acceptance models (TAM, UTAUT) which are often invoked to assess how perceived usefulness and ease of use of service robots influence guest acceptance (Ivanov & Webster, 2019b). Another perspective is the **diffusion of innovations**: Huang et al. (2022) bridge Rogers' diffusion theory with AI adoption by proposing a framework to evaluate various AI innovations (from chatbots to robots) on attributes such as relative advantage, compatibility, complexity, and trialability. Their theory-driven assessment helps explain why certain AI applications (e.g. mobile concierge apps or chatbots) see faster uptake than others in hospitality settings.

In general, service automation literature acknowledges substantial operational benefits of AI – such as cost savings, speed, and scalability of services – but also discusses management implications. Studies caution that automating services is not just a technical issue but a managerial one: firms must address employee retraining, job redesign, and integration of AI into service workflows. Some papers even highlight emerging issues of **labor displacement and ethics**. For example, Yeh et al. (2020) conduct a systematic review on AI's impact on employment and warn that increasing automation could displace certain jobs in tourism, requiring proactive strategies for workforce development and policy guidance. Such concerns foreshadow discussion in later sections on research gaps around the human side of AI integration. The issues emphasized herein suggest future dialogues on research deficiencies regarding the human element in AI assimilation.

Building on these foundational insights into service automation, recent research has introduced more nuanced perspectives by focusing on the typologies of AI robots and the organizational factors influencing their adoption in hospitality settings. Saputra et al. (2024) propose a novel **anthropomorphism-based typology** of **AI robots** in hospitality and tourism, classifying them into four categories: **chatbots**, **mechanoids**, **humanoids**, and **android robots**. The study emphasizes that anthropomorphic features (both physical and behavioral) significantly influence **customer perceptions**, **service evaluations**, and **adoption willingness**. Importantly, the authors highlight that the level of **human-likeness** should match the **service function**: for instance, simple functions are better served by mechanoids, while emotional interactions may benefit from humanoids. However, the research warns about the "**uncanny valley**" phenomenon; overly human-like robots can trigger discomfort among guests, ultimately harming service satisfaction. This suggests that while anthropomorphism can enhance **human–robot interaction (HRI)**, excessive realism may backfire without careful design. Nevertheless, a limitation of this study is that the proposed typology has yet to be empirically validated across diverse real-world hospitality settings, which could affect its practical generalizability.

Complementarily, Irani (2024) examines the readiness of the **North Cyprus hospitality industry** to integrate **robot-assisted services** through a qualitative study. The findings reveal several barriers to adoption: **insufficient awareness** among hotel managers, inadequate training for operating robots, **limited budgets** for technological investment, **adherence to traditional management practices**, and a **lack of supportive incentives from tourism authorities**. While the potential of robotics to enhance **operational efficiency** is acknowledged, **cultural resistance** and **structural limitations** present significant hurdles. Irani's study critically points out that successful adoption of robotics in hospitality is not only a **technological issue** but also requires deep **organizational and policy-level transformations** to foster **innovation acceptance** and **sustainability**. However, the study's findings are limited by the geographic and managerial focus on North Cyprus, which may restrict the applicability of results to broader international hospitality contexts.

Customer Experience Personalization and Engagement

Enhancing customer experience is a central promise of AI in tourism. Many conceptual studies focus on how AI can enable *personalized and interactive services* that improve traveler satisfaction and engagement. A frequently cited application is **AI-powered chatbots and virtual assistants** for customer service. These AI agents, deployed on hotel websites, mobile apps, or messaging platforms, can handle common inquiries, provide travel recommendations, and even make reservations in natural language. Chi et al., (2020) present a systematic review of AI devices in service delivery, finding that chatbots and voice assistants are becoming integral in hospitality for instant, 24-hour customer support. They report that AI-driven personal assistants (for example, cruise line concierge apps or smart speaker devices in hotel rooms) markedly improve service convenience and personalization, such as by addressing guests' questions in multiple languages on demand. Closely related are **recommender systems** and personalized marketing tools powered by AI. Several studies note that machine learning algorithms enable highly tailored travel recommendations. For instance, Samara et al., (2020) review AI and big data in tourism and conclude that AI facilitates *trust-based recommendations*, meaning systems that learn user preferences and behavior to suggest destinations or services that users are likely to value. This personalization builds customer trust and loyalty as travelers feel that suggestions are relevant and helpful. Another study by Doborjeh et al. (2022) systematically reviews AI methods in hospitality/tourism, highlighting that **customer relationship management (CRM)** has been revolutionized by big data analytics: AI can aggregate and analyze customer data (search history, past purchases, social media posts) to know travelers 'better than any staff' and offer individualized travel services. AI-driven CRM and sentiment analysis tools can even gauge customer emotions and satisfaction from online reviews, enabling businesses to respond proactively.

Virtual and augmented reality (VR/AR) are another facet of AI-related innovation to enhance experiences. While VR/AR are distinct technologies, they often incorporate AI for content personalization. Li et al. (2021) discuss how AI-integrated media (such as VR tours that adapt to user input) can **amplify tourist experiences**, leading to higher satisfaction and likelihood of positive recommendations. Likewise, Das et al. (2021) argue that AI can even offer *substitute experiences* via AR – for example, allowing virtual visits to cultural heritage sites – which not only enhance engagement but can mitigate over-tourism at sensitive sites. From a theoretical angle, **customer experience management** and **service quality** frameworks are enriched by AI considerations. Several authors integrate concepts like co-creation and personalization into service-dominant logic for tourism. Leung (2020), in a perspective article, forecasts that **traveler co-creation** will play a considerable role in the future of tourism services, as AI tools enable tourists to actively customize and co-produce their experiences. This view aligns with emerging service theory that sees customers as partners in creating value, with AI acting as a facilitator of this interaction.

Additionally, trust and **human–computer interaction** theories are relevant: as AI becomes the 'face' of customer service, issues of trust, satisfaction, and even the 'uncanny valley' effect (in the case of humanoid robots) must be managed. Some studies note that poorly implemented AI interactions can lead to frustration; thus, the design of AI interfaces should account for user psychology and expectations (a point drawing from human-computer interaction theory). Importantly, Osei et al. (2020) observe that *customer reluctance to use new technologies* can pose a serious challenge for tourism firms adopting AI. If customers are uncomfortable with, say, a robot butler or an AI tour guide, the intended experience enhancements may backfire. This highlights the need to manage the **technology acceptance and change management** aspects of AI-enabled customer experience programs.

Building on these earlier insights into AI-driven personalization, recent empirical studies have expanded the understanding of how artificial intelligence, immersive technologies, and data-driven strategies are reshaping customer experience personalization in tourism and hospitality sectors. Talukder & Hoque (2024) investigate the transformative impact of technological improvements on traditional travel agencies. Their study highlights how travel firms are adjusting to the changing demands and preferences of travelers in the digital era through the integration of **artificial intelligence (AI)**, **virtual reality (VR)**, **augmented reality (AR)**, and **data-driven personalization**. The study also discusses the challenges and opportunities faced by agencies, analyzing the effects of digital transformation on traditional business models and emphasizing the need for travel agencies to embrace digital innovation to remain competitive. However, a critical challenge identified is the **organizational inertia and resistance to technological adoption** often observed among traditional agencies, which may limit the effectiveness of digital transformation initiatives.

Yang et al. (2024) examine **Personalized Tourism Recommendations (PTR)** in the context of **e-tourism user experience**, integrating constructs from PTR, big data, artificial intelligence, and the technology acceptance model, using the **Stimulus-Organism-Response (S-O-R)** theory. Based on an online survey of 496 users from the Ctrip platform and analyzed through **PLS-SEM**, the study identifies **perceived personalization**, **visual appearance**, and **information quality** as key factors stimulating consumers' perceptions of PTR. While the findings contribute to understanding how these factors influence users' trust and attitudes toward personalized services, the study also implicitly suggests that **overemphasis on personalization without considering user privacy concerns** could undermine consumer trust, representing a potential limitation in practical applications.

Moreover, as the sample is based solely on users of a single Chinese platform (Ctrip), the generalizability of the findings to global tourism contexts remains limited. Gonçalves et al. (2024) bridge the fields of **extended reality (XR)** and **luxury hospitality**, investigating how **immersive AI technologies** impact customer perceptions of luxury value and consumer differentiation. Across three experimental studies, the authors find that immersive AI applications, compared to traditional hospitality, **reduce customers' behavioral intentions** and **lower perceived luxury value**, particularly when customers seek differentiation. The research highlights the potential detrimental effects of immersive AI on luxury service perceptions if customer needs for human touch and exclusivity are not carefully managed.

However, the study is experimental in nature, and its scenarios might not fully capture the complex real-world interactions that occur in actual luxury service environments, limiting external validity.

Lv et al. (2024) study how **AI-powered personalized luxury recommendations** influence **customers' life satisfaction** in luxury tourism marketing. Drawing upon **self-perception theory,** and based on three experimental studies across different tourism contexts (hotel, restaurant, and airport shopping), they demonstrate that personalized luxury recommendations enhance customers' **perceived future self-growth**, thereby improving their **life satisfaction**. However, this positive effect is found to weaken when recommendations are presented using **user-based framing** rather than emphasizing the exclusivity of the offer, suggesting that personalization strategies must carefully manage the balance between personalization and perceived exclusivity. The study's limitations include reliance on scenario-based experiments and the use of self-reported measures of life satisfaction, which may not fully reflect real-world behaviors or emotions.

AI in Marketing and Managerial Decision-Making

AI's role in tourism marketing and management emerges as a theme overlapping with customer experience but extending to **strategic and analytical functions**. AI techniques like machine learning, and natural language processing (NLP) are increasingly used to glean market intelligence and inform marketing strategy in tourism. Giotis & Papadionysiou (2022) provide a review of technological innovations in tourism and note that AI tools have become essential in analyzing consumer data and automating marketing campaigns. One key contribution of AI is the ability to segment and target customers with tailored marketing messages at scale. For example, AI algorithms can analyze past traveler behavior to identify those most likely to be interested in a specific tour package, and then automatically deliver customized advertisements to those individuals. This degree of precision targeting was previously unattainable with conventional analytics. Artificial intelligence's capacity to segment and precisely target customers with personalized marketing messages at a large scale is a significant benefit. AI algorithms can examine previous travel patterns and pinpoint people who are most likely to be interested in a particular tour package, then automatically provide them with customized advertisements. This level of targeted marketing was not possible with traditional analytics.

Moreover, AI helps monitor and manage **online reputations** and social media marketing. By deploying sentiment analysis on travel reviews or social media posts, tourism businesses can gauge public perception in real time and adjust their marketing or service recovery efforts accordingly. Several studies highlight how **user-generated content analysis** using AI can provide valuable insights: for instance, big data from TripAdvisor reviews or Twitter feeds can be mined to identify drivers of customer satisfaction or pain points in the visitor experience. This information feeds back into managerial decision-making, supporting evidence-based improvements in service offerings and marketing communications.

In terms of managerial decision support, AI-driven **business intelligence systems** are being adopted in the tourism sector. Chen et al., (2022) conduct a bibliographic study on big data analytics and predictive techniques for business intelligence, noting that tourism and hospitality firms are turning to AI for revenue management, pricing optimization, and demand forecasting as discussed earlier. These AI systems can analyze historical booking patterns, competitor pricing, and even weather or event data to recommend optimal pricing and inventory allocation strategies (a practice often termed **yield management** in airlines and hotels). The conceptual literature suggests that such data-driven decision-making is part of the **digital transformation** of tourism organizations, promising greater agility and responsiveness to market changes.

A theoretical perspective common in this theme is **decision theory and analytics**. Researchers often frame AI as a decision-support tool that enhances the bounded rationality of human managers. By quickly processing vast information, AI can reduce uncertainty and support more rational decision outcomes in areas like marketing mix optimization and service design. Another relevant concept is **dynamic capabilities** – the idea that firms need to continuously integrate new technologies to sense and respond to the environment. AI is viewed as a capability that can help firms better sense consumer trends (through analytics) and seize opportunities (through targeted marketing and personalization), thereby renewing their competitive advantage in fast-changing tourism markets.

Recent research continues to emphasize AI's strategic role in enhancing tourism marketing and managerial decision-making. Li et al., (2024) apply **predictive processing theory** to examine how **AI-driven robotic performances** influence tourist emotions and **electronic word-of-mouth (eWOM)** behaviors. Their empirical study finds that interactive and novel AI-enhanced performances significantly encourage **positive eWOM**, mediated through heightened emotional engagement. However, melodic aspects of performances were found to have no significant effect on consumer sharing behaviors. A limitation of this study is its cultural focus, as the sample is primarily **U.S.-based**, which may restrict generalizability across different tourist populations and service settings.

In the area of immersive technology adoption, Sujood & Pancy (2024) integrate the **Theory of Planned Behavior (TPB)**, the **Technology Acceptance Model (TAM)**, and the **Stimulus-Organism-Response (S-O-R) framework** to explore how tourists form intentions to experience immersive technologies at destinations. Their findings highlight that virtual interactivity, social interaction, perceived usefulness, trust, and perceived behavioral control are strong predictors of adoption intention, while perceived ease of use and motivation showed no significant impact. These insights have important implications for marketing managers aiming to promote immersive experiences. A noted limitation is the exclusive focus on **Indian tourists**, suggesting that future research should test the model across different cultural and destination contexts to validate broader applicability.

Complementing these developments, Blanco-Moreno et al. (2024) investigate how tourists express **happiness** during their travel experiences using **artificial intelligence** techniques to analyze **Instagram posts**. Their mixed-methods study shows that positive emotions are predominantly reflected through **socialization** and **self-representation** behaviors (e.g., selfies) rather than solely textual expressions. Importantly, the presence of **social companions** and the **gender composition** of travel groups significantly enhanced tourists' emotional engagement with the destination. A critical limitation of this study is its narrow focus on a **single cultural and gastronomic tourism destination** in Spain, which may limit the generalizability of the findings across broader tourism markets and experiences.

Smart Tourism and Sustainability

An emerging theme in the literature is the intersection of AI with **smart tourism** initiatives and sustainability goals. Smart tourism refers to the integration of information and communication technologies (ICT), including IoT (Internet of Things), big data, and AI, to create intelligent systems to manage destinations and enhancing tourist experiences. AI is a backbone of smart tourism ecosystems, enabling real-time data processing and automated decision-making. Several studies within the review period explore how AI contributes to more **sustainable and smart destination management**. For instance, Gaur et al. (2021) review the role of AI and robotics in fostering *'touchless' travel* during the COVID-19 pandemic, an aspect of smart tourism focused on health safety and seamlessness. They suggest that AI-powered contactless services (such as robotic cleaners, voice-activated controls, and facial recognition check-ins) became especially important in the pandemic context to reduce physical contact while maintaining service quality. This not only has public health benefits but also improves efficiency and can be part of a sustainable operations strategy in the long run.

AI also aids sustainability by optimizing resource usage and supporting environmental management. Several conceptual papers note that AI systems can help **optimize energy consumption, waste reduction, and resource allocation** in tourism operations (for example, smart hotel thermostats and lighting systems that learn guest preferences to save energy). Lv et al., (2022) review big data and AI literature in hospitality and find that these technologies are being used to monitor environmental performance – for example, analyzing data on water/electricity usage and guest behavior to improve conservation without compromising guest comfort. In the context of destinations, Rahmadian et al. (2022) provide a systematic review on big data for sustainable tourism and illustrate how AI can analyze visitor movement patterns (via GPS, mobile data) to manage crowding in parks and protect natural resources. Such insights enable destination managers to implement smart strategies like dynamic visitor routing or capacity limits that enhance sustainability.

The notion of **smart tourism** heavily emphasizes system integration. Tussyadiah (2020) and others argue that the **convergence of AI, IoT, and big data** forms the core of smart tourism ecosystems, which can not only improve visitor experiences but also promote sustainable practices through intelligent management. For example, IoT sensors might detect overcrowding at a heritage site and trigger AI-driven redistribution of visitors via real-time notifications or incentives to visit alternative sites, thus preventing environmental degradation. In cultural heritage tourism, AI and VR have been proposed as tools to provide virtual experiences that reduce physical tourist pressure on fragile sites. Loureiro et al. (2022), using a text-mining review approach, note that advanced technologies like AI-driven virtual tours can help **preserve heritage** by allowing immersive digital experiences, potentially substituting some physical visits and thereby mitigating wear and tear on cultural assets. This theme also touches on the broader concept of **sustainable tourism development**. The literature conceptually links AI to the triple-bottom-line of sustainability: economically, AI can improve efficiency and profitability; environmentally, it can aid conservation and resource management; and socially, it can enhance tourist satisfaction and safety. However, a careful balance is needed – reliance on AI should not create new issues such as exacerbating digital divides or reducing local employment opportunities. These concerns bridge into the discussion of challenges and research gaps. Table 1 provides a summary of the key thematic areas identified in the review, along with examples of AI applications and illustrative references. The integration of advanced artificial intelligence (AI) technologies into destination ecosystems continues to drive innovation in smart tourism and sustainability research. Schuhbert et al., (2024) examine how the integration of **deep learning (DL)** with traditional **organizational learning (OL)** processes can catalyze innovation at tourism destinations, using Berlin as a case study.

Their scenario analysis emphasizes that **AI-supported learning systems**, when combined with human organizational learning, can significantly enhance **knowledge creation**, **resource optimization**, and **adaptive management** which are key drivers for smart and sustainable destinations. However, they critically note that fragmented knowledge networks, insufficient data interoperability, and cultural resistance among tourism stakeholders present serious barriers. A methodological limitation of their study is **the reliance on a single destination (Berlin)** and the **use of scenario-based forecasting**, which may limit the broader applicability of the findings across different tourism environments.

Complementarily, Palomo et al., (2024) conduct a comprehensive **bibliometric review** on the evolution of **Smart Tourism Destinations (STD)** research from 2000 to 2023. Their findings reveal that AI, big data analytics, and robotics have become increasingly pivotal in shaping STD strategies aimed at improving sustainability, personalization, and visitor management. Yet, they caution that while technological integration is accelerating, challenges such as stakeholder adoption lags, fragmented conceptual frameworks, and ethical concerns about data governance persist. A critical limitation of their study lies in the **exclusive use of the Web of Science (WoS) database**, potentially omitting relevant literature indexed elsewhere. Additionally, they suggest that future research should adopt more interdisciplinary methods to better align **AI-driven smart tourism initiatives** with broader **sustainability and inclusivity goals**.

Human resources management

With the widespread adoption of AI technology following the launch of ChatGPT's pioneering chatbot service in late 2022, research has increasingly focused on the development of human resource technology competencies and the potential for AI-driven technology responses to the industry's labour shortages. Beyond operational efficiency, recent research highlights the transformative role of **AI and automation** in addressing critical **human resources management (HRM)** challenges within tourism and hospitality. Birdir & Sahilli Birdir (2024) synthesize findings from a special issue exploring technology-driven responses to the sector's labor shortages. They emphasize that **AI, robotics, 3D printing, and unmanned smart hotels** offer viable solutions to workforce gaps by automating repetitive tasks and enabling leaner operations. However, they also critically acknowledge that while these technologies can alleviate shortages, barriers such as **high implementation costs, maintenance demands**, and **scale-up challenges** persist. Moreover, a limitation of their editorial synthesis is that it aggregates multiple papers thematically without offering empirical validation of the proposed solutions' long-term workforce impacts.

Adding a conceptual layer, Ercik & Kardaş (2024) conduct a comprehensive review on the impact of **digital transformation** on HR practices in tourism. Their findings show that **AI-driven recruitment**, **performance management systems**, and **digital training platforms** have redefined skill demands, necessitating continuous upskilling and technological literacy among employees. They also highlight ethical risks around **data privacy**, **employee surveillance**, and **work-life balance erosion** due to hyper-connectivity. Nevertheless, a methodological limitation of their study is its reliance solely on secondary sources without empirical validation; thus, the findings may overlook practical nuances experienced by frontline staff and managers in actual implementation contexts.

From an employee-centric viewpoint, Kang et al., (2024) explore how **AI adoption increases job insecurity and turnover intentions** among hotel employees. Using structural equation modeling on a sample of South Korean hotel workers, they find that **AI awareness elevates job stress**, which in turn fosters **turnover intentions**, especially towards sectors outside hospitality. The study offers valuable empirical evidence, but it has certain limitations: it focuses only on a specific national context (South Korea), and the cross-sectional design limits the ability to infer long-term causal relationships between AI deployment and workforce attrition. Focusing on generational dynamics, Fu et al. (2024) perform a systematic literature review on **Generation Z's engagement with RAISA technologies** (Robots, Artificial Intelligence, and Service Automation) in hospitality. Their findings reveal that while Gen Z consumers and employees are more digitally inclined and receptive to automation, there are still concerns over **loss of human touch**, **privacy risks**, and **ethical deployment** of AI tools. A critical limitation they highlight is the **over-reliance on quantitative studies** in the existing literature and **geographic biases** favoring Asian markets, suggesting the need for more mixed-methods and cross-cultural research to generalize findings globally.

Table 1. Key themes in the literature of AI and tourism, with examples of applications and sources (Source: own construction)

Thematic Area	Focus of AI Applications	Representative Studies
Demand Forecasting & Analytics	Predicting tourism demand, visitor flows, and market trends using AI (machine learning models, big data analytics, hybrid models, online review sentiment analysis).	Song et al. (2019); Jiao & Chen (2019); Liu et al. (2019); Hu et al. (2023); Liao et al. (2023)
Service Automation & Robotics	Using robots and automated systems in service delivery (hotels, restaurants, attractions) to improve efficiency, consistency, and guest experience.	Ivanov et al. (2019); Cain et al. (2019); Tussyadiah (2020); Saputra et al. (2024); Irani (2024)
Customer Experience Personalization	Personalizing services, experiences, and emotional engagement through AI (chatbots, virtual assistants, recommender systems, immersive AI, VR/AR experiences, and luxury personalization).	Chi et al. (2020); Doborjeh et al. (2022); Samara et al. (2020); Talukder & Hoque (2024); Yang et al. (2023); Gonçalves et al. (2024); Lv et al. (2024)
Marketing & Consumer Engagement	AI-driven market segmentation, targeted advertising, sentiment analysis of reviews, eWom stimulation, immersive experience marketing, and social media emotional analysis for marketing decisions.	Giotis & Papadionysiou (2022); Leung (2020); Chen et al. (2022b); Li et al. (2024); Sujood & Pancy (2024); Blanco-Moreno et al. (2024)
Smart Tourism & Sustainability	Integrating AI in smart destination management, resource optimization, organizational learning for innovation, bibliometric mapping of smart destination evolution, and sustainable tourism planning (smart ecosystems, contactless services, environmental monitoring).	Gaur et al. (2021); Rahmadian et al. (2022); Loureiro et al. (2022); Schuhbert et al. (2024) ; Palomo Santiago & Parra López (2024)
Human resources management	Developing the technological competence of human resources, AI-driven recruitment and training, managing job insecurity and turnover, and addressing ethical challenges of AI adoption in labor management.	Birdir & Sahilli Birdir (2024); Ercik & Kardaş (2024); Kang et al. (2024); Fu et al. (2024)

DISCUSSION

Through this systematic review, we identified major themes in how AI is conceptualized and studied in tourism, as well as notable gaps and future directions. The findings reveal that AI in tourism is a multifaceted topic, touching on technical, managerial, and social dimensions. Here we discuss the implications of the results, critically analyze the state of knowledge, and pinpoint areas for further research. **Research Trends and Evolution:** The volume of research on AI in tourism has grown exponentially since the mid-2010s. Early discussions around 2014–2016 often framed AI within the emerging paradigm of *smart tourism*, focusing on potential applications (e.g. smart destinations, recommendation systems) and drawing heavily from the Information Systems literature. As indicated by a recent bibliometric analysis, the core research clusters revolve around 'artificial intelligence', 'hospitality', and 'tourism', confirming that scholars have coalesced around applying AI to service contexts. Notably, since 2018 there has been a shift from purely conceptual or descriptive studies to more empirical investigations assessing AI implementations and their outcomes. Mandić et al. (2024) observed that the research emphasis moved from promoting automated systems in principle to addressing practical challenges in the workplace and customer service as AI adoption became reality. This suggests a maturation of the field – initial optimism and exploration gave way to more nuanced analysis of the effects of AI.

Contributions and Strengths: The extant literature collectively provides a broad understanding of the roles AI can play in tourism. One clear contribution is to outline the **benefits and opportunities** of AI deployment. Studies consistently highlight efficiency gains (e.g. faster data-driven decisions, reduced labor costs, 24/7 service availability) and enhancements to customer experience (personalization, reduced waiting times, new forms of engagement like virtual tours). Another strength is the development of **conceptual frameworks** that guide understanding of AI in tourism. For instance, several works propose frameworks categorizing AI applications, such as Huang et al.'s (2022) seven-dimension framework for AI adoption susceptibility, or frameworks distinguishing front-of-house vs. back-of-house AI systems. These frameworks are valuable for scholars and practitioners to systematically evaluate where and how AI can be leveraged in tourism operations and what factors influence its success. Additionally, the literature has begun to incorporate **theoretical foundations** from innovation diffusion, technology acceptance, and service management to explain AI phenomena. By doing so, it grounds the discussion of AI not just in technical terms but in terms of human behavior and organizational strategy, which is crucial for tourism – an industry ultimately about human experiences.

Interdisciplinary Integration: We find that tourism scholars have engaged with knowledge from computer science (e.g. understanding AI techniques), but more importantly, have contextualized AI within tourism theories. This interdisciplinary approach is evident in works that merge data science with consumer behavior theory, or robotics with hospitality management models. For example, integrating Rogers' diffusion of innovations theory helped identify which AI tools are more likely to be adopted in hospitality (those offering clear relative advantage and ease of use, like chatbots, are adopted faster). Such insights enrich both tourism management theory and provide feedback to technology developers about user requirements in a service context.

Despite these strengths, the review also uncovered **gaps and challenges** in the literature:

- **Limited Research on Human-AI Interaction in Tourism:** While many studies tout the benefits of AI, fewer delve into the **nuanced interaction between AI systems, employees, and customers**. There is a need for deeper investigation into how customers perceive and trust AI in different service scenarios. For instance, the novelty of robot staff could intrigue some visitors but alienate others. Only a handful of studies (Ivanov et al., 2019; Tussyadiah, 2020) explicitly address negative attitudes or discomfort toward AI. Future research should empirically examine factors affecting guest acceptance of AI, drawing on psychology and marketing insights. Similarly, employees' perspectives are under-researched – how do tourism workers adapt to AI tools or robotic colleagues? Initial work suggests technology anxiety and job insecurity can be issues, impacting employee well-being. More qualitative studies or organizational research in this vein would be valuable.
- **Insufficient Focus on Ethical and Privacy Concerns:** The conceptual discourse on **ethics, data privacy, and security** in AI-tourism is relatively sparse. Given AI systems often rely on personal data (travel history, biometrics for facial recognition, etc.), questions of privacy and consent loom large. Only a few papers (often outside mainstream tourism journals) tackle issues like data governance or algorithmic bias in a tourism context. For instance, a systematic review by Mandić et al. (2024) noted a gap in research addressing **data privacy and human–robot interaction ethics**. This represents a significant research gap – future studies should examine how to ensure ethical AI deployment in tourism, perhaps borrowing frameworks from computer ethics or developing industry-specific guidelines (e.g. for use of facial recognition at attractions, or AI surveillance in hotels). There is also a need to study the impact of AI on accessibility and inclusivity in tourism: Can AI tools be designed to better serve travelers with disabilities or from different cultural backgrounds? Such questions of equity have seen little coverage so far.
- **Fragmentation and Terminology Issues:** Our review noted that 'AI in tourism' means different things in different studies – some include robotics, some focus on algorithms, others on data analytics. This lack of standard definitions sometimes makes it hard to compare studies. For example, one paper might consider 'AI' as synonymous with robots and ignore non-embodied AI like machine learning software, whereas another does the opposite. While the broad scope of AI means it indeed encompasses many technologies, the literature could benefit from clearer categorization or terminology consensus.
- **Methodological Rigor and Coverage:** Methodologically, many of the included literature reviews (including this one) use systematic approaches, which is commendable. However, there are still areas under-explored. For example, **meta-analyses** quantifying the effect of AI on outcomes (like satisfaction or efficiency) are scarce. A meta-analysis could statistically synthesize findings from various experimental studies (e.g. on chatbot vs human agent satisfaction levels) to provide higher-level evidence. Also, regional imbalances exist: much conceptual work comes from developed regions (Europe, North America, East Asia). Regions like Africa or South America have less representation in the conceptual AI tourism literature, potentially overlooking context-specific challenges or uses (although Soliman et al. (2023) used bibliometrics to highlight some global trends amidst COVID-19). Future research collaborations or comparative studies could address this imbalance, examining how AI adoption in tourism might differ in, say, developing countries or under different cultural values.
- **Emerging Technologies and Future Scenarios:** The tourism AI literature has begun to address up-and-coming technologies (like the use of **neuro-tourism** techniques or **large language models**), but this is still nascent. Al-Nafjan et al. (2023) explore 'neuro-tourism' – applying AI to analyze brain data for understanding tourist experiences – which opens a novel line of inquiry merging neuroscience with tourism marketing. Similarly, the explosion of **generative AI** (e.g. GPT-4, large language model chatbots) in 2023 begs the question of how these could transform travel planning and content

creation. As of the cut-off for this review, few academic studies covered such generative AI in tourism, representing an important future direction. Researchers should look at scenarios like AI-generated travel itineraries, deepfake tour guides, or automated content creation for destination marketing, assessing their feasibility and impact. These emerging issues are both opportunities (for innovation) and challenges (for ensuring authenticity and managing potential misinformation), and thus rich areas for theoretical exploration. In summary, the current body of literature provides a solid foundation affirming that AI holds significant promise for tourism in enhancing efficiency, personalization, and strategic decision-making. Yet, it also highlights that *technology alone is not a panacea* – human factors, ethical considerations, and implementation strategies critically determine AI's ultimate success in the sector. There is a noticeable shift in recent research towards addressing these broader implications rather than just showcasing technology capabilities. Going forward, bridging gaps such as those in user acceptance, ethics, and global inclusivity will be key to advancing both the theory and practice of AI in tourism.

CONCLUSION

This systematic literature review examined the conceptual and theoretical discourse on artificial intelligence in tourism from 2019 onwards, following a rigorous PRISMA-guided methodology. From an initial pool of over 400 studies, we identified 45 relevant peer-reviewed journal articles that collectively illuminate how AI is reshaping tourism research and practice. The review finds that AI is envisioned as a catalyst for transformation in the tourism industry, with applications ranging from intelligent forecasting and revenue management to service automation via robots and hyper-personalized travel experiences. Researchers have documented numerous potential benefits of AI: improved predictive accuracy for tourism demand, cost and time efficiencies through automation, enhanced customer satisfaction through personalized recommendations and 24/7 chatbot assistance, and even contributions to sustainable tourism goals through smart resource management. These advantages underscore the importance of AI as a driver of innovation and competitiveness in tourism.

Crucially, this review also synthesized the *theoretical perspectives* underlying AI research in tourism. Studies have drawn on innovation diffusion theory to explain adoption patterns, technology acceptance models to gauge user and employee attitudes, and service quality and co-creation theories to understand how AI can add value to the customer experience. The integration of such theories marks a maturation of the field – moving beyond technological novelty to situate AI within established bodies of knowledge in tourism management and consumer behavior. For instance, viewing AI through the lens of service-dominant logic highlights that value is co-created by AI systems in partnership with human actors (customers and employees) rather than by technology alone. This theoretical foundation is essential for developing a holistic understanding of the role of AI and for guiding practical implementation strategies.

Despite the progress, the review identified several gaps and challenges that warrant attention. Ethically, questions around data privacy, algorithmic bias, and the socio-economic impacts of automation in tourism remain insufficiently addressed. Additionally, the *human element* in AI-enabled tourism needs deeper exploration. There is also room for more cross-cultural research, considering that acceptance of technologies like social robots can vary widely across cultures.

In terms of future research directions, several promising avenues emerge. Scholars should examine the implications of **next-generation AI technologies** in tourism. The rise of generative AI and advanced language models opens new possibilities for automated content creation – for example, AI could personalize travel narratives or simulate interactive dialogues as part of a virtual tour experience. Investigating how these tools can enhance (or potentially disrupt) areas like tour guiding, marketing content, and trip planning is timely. Furthermore, building on the current focus of smart tourism, researchers could develop models for **AI-enhanced destination management**, exploring how real-time data and AI optimization can help manage tourist flows, improve accessibility, or respond to crises (like pandemics or natural disasters) in a destination. Moreover a systematic evaluation of AI's **return on investment and performance outcomes** in tourism businesses would be highly valuable as well.

From a practical point of view, the insights in this review suggest that tourism stakeholders should approach AI adoption strategically. It is advisable for organizations to start with AI applications that have proven value (such as chatbots for customer service or recommendation engines on booking platforms) and ensure that they are implemented in a user-friendly manner. Training employees to work effectively with AI, and preparing change management plans, will help mitigate resistance and maximize the augmentation effects of AI on human labor. At the industry level, collaboration will be key – sharing best practices through industry associations or partnerships between tech firms and tourism operators can accelerate learning and avoid pitfalls. Policymakers and educators also have a role: policies might be needed to govern data use and protect workers, while hospitality education should incorporate AI literacy to prepare the workforce of the future.

In conclusion, AI stands as a powerful tool that is increasingly interwoven with the fabric of tourism systems. The literature from the past decade paints AI not as a distant futuristic concept, but as a present reality gradually permeating all facets of travel and hospitality – from how destinations are marketed and managed, to how services are delivered and experienced. The **conceptual consensus** is that AI, when thoughtfully integrated, can significantly improve both operational efficiency and the tourist experience, potentially leading to smarter and more sustainable tourism development. However, realizing this potential requires careful navigation of the associated challenges and a commitment to keeping the 'human touch' in an AI-rich tourism future. We hope that this systematic review serves as a foundation for both scholars and practitioners to understand current knowledge, identify what remains unknown, and collaborate in steering the evolution of AI in tourism in a positive, human-centric direction.

Author Contributions: Conceptualization, F.E. and L.K.; methodology, F.E., B.F. and L.K.; validation, L.K. and R.T.; formal analysis, R.T.; investigation, F.E., B.F. and L.K.; data curation, B.F.; writing - original draft preparation, F.E. and

B.F.; writing - review and editing, L.K. and R.T.; visualization, F.E.; supervision, L.K.; project administration, F.E. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgements: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Al-Hyari, H.S., Al-Smadi, H.M., & Weshah, S.R. (2023). The impact of artificial intelligence (AI) on guest satisfaction in hotel management: An empirical study of luxury hotels. *GeoJournal of Tourism and Geosites*, *48*(2), 810–819. https://doi.org/10.30892/gtg.482spl15-1081

Al-Nafjan, A., Aldayel, M., & Kharrat, A. (2023). Systematic review and future direction of neuro-tourism research. *Brain Sciences, 13*(4), 682. https://doi.org/10.3390/brainsci13040682

Birdir, K., & Sahilli Birdir, S. (2024). Conclusion: addressing the labor shortage problem in the hospitality and tourism industries. *Worldwide Hospitality and Tourism Themes, 16*(5), 664–667. https://doi.org/10.1108/WHATT-09-2024-0233

Blanco-Moreno, S., González-Fernández, A. M., Muñoz-Gallego, P. A., & Egger, R. (2024). What do you do or with whom? Understanding happiness with the tourism experience: an AI approach applied to Instagram. *Humanities and Social Sciences Communications*, 11(1), 346. https://doi.org/10.1057/s41599-024-02859-z

Cain, L. N., Thomas, J. H., & Alonso Jr., M. (2019). From sci-fi to sci-fact: The state of robotics and AI in the hospitality industry. *Journal of Hospitality and Tourism Technology, 10*(4), 624–650. https://doi.org/10.1108/JHTT-07-2018-0066

Chen, Y., Li, C., & Wang, H. (2022). Big Data and Predictive Analytics for Business Intelligence: A Bibliographic Study (2000–2021). *Forecasting, 4*(4), 767-786. https://doi.org/10.3390/forecast4040042

Chi, O. H., Denton, G., & Gursoy, D. (2020). Artificially intelligent device use in service delivery: A systematic review, synthesis, and research agenda. *Journal of Hospitality Marketing & Management, 29*(7), 757–786. https://doi.org/10.1080/19368623.2020.1721394

Das, G., Jain, S. P., Maheswaran, D., Slotegraaf, R. J., & Srinivasan, R. (2021). Pandemics and marketing: insights, impacts, and research opportunities. *Journal of the Academy of Marketing Science, 49*(5), 835–854. https://doi.org/10.1007/s11747-021-00786-y

Doborjeh, Z., Hemmington, N., Doborjeh, M., & Kasabov, N. (2022). Artificial intelligence: A systematic review of methods and applications in hospitality and tourism. *International Journal of Contemporary Hospitality Management, 34*(3), 1154–1176. https://doi.org/10.1108/IJCHM-06-2021-0767

Ercik, C., & Kardaş, K. (2024). Reflections of digital technologies on human resources management in the tourism sector. Worldwide *Hospitality and Tourism Themes*, 16(5), 646–663. https://doi.org/10.1108/WHATT-09-2024-0208

Fu, M., Fraser, B., & Arcodia, C. (2024). Digital natives on the rise: A systematic literature review on generation Z's engagement with RAISA technologies in hospitality services. *International Journal of Hospitality Management*, 122. https://doi.org/10.1016/j.ijhm.2024.103885

Gaur, L., Afaq, A., Singh, G., & Dwivedi, Y. K. (2021). Role of artificial intelligence and robotics to foster the touchless travel during a pandemic: A review and research agenda. *International Journal of Contemporary Hospitality Management, 33*(11), 4079–4098. https://doi.org/10.1108/IJCHM-11-2020-1246

Giotis, G., & Papadionysiou, E. (2022). The role of managerial and technological innovations in the tourism industry: A review of the empirical literature. *Sustainability, 14*(9), 5182. https://doi.org/10.3390/su14095182

Gonçalves, A.R., Costa Pinto, D., Shuqair, S., Mattila, A. and Imanbay, A. (2024). The paradox of immersive artificial intelligence (AI) in luxury hospitality: how immersive AI shapes consumer differentiation and luxury value. *International Journal of Contemporary Hospitality Management, 36*(11) 3865–3888. https://doi.org/10.1108/IJCHM-11-2023-1689

Henriques, H. J. G., Almeida, C. R., & Ramos, C. M. Q. (2024). The application of artificial intelligence in the tourism industry: A systematic literature review based on PRISMA methodology. *Journal of Tourism, Sustainability and Well-being, 12*(1), 65–86. https://doi.org/10.34623/hkqk-ht95

Hu, M., Yang, H., Wu, D. C., & Ma, S. (2024). A novel two-stage combination model for tourism demand forecasting. *Tourism Economics*, 30(8), 1925–1950. https://doi.org/10.1177/13548166241237845

Huang, A., Chao, Y., Velasco, de la Mora Velasco, E., Bilgihan, A., & Wei, W. (2022). When artificial intelligence meets the hospitality and tourism industry: An assessment framework to inform theory and management. *Journal of Hospitality and Tourism Insights, 5*(5), 1080–1100. https://doi.org/10.1108/JHTI-01-2021-0021

Irani, F. (2024). Exploring the future of tourism: A qualitative study on the integration of robotics in North Cyprus hospitality and destination development. *Worldwide Hospitality and Tourism Themes, 16*(6), 694–705. https://doi.org/10.1108/WHATT-05-2024-0097

Ivanov, S., Gretzel, U., Berezina, K., Sigala, M., & Webster, C. (2019). Progress on robotics in hospitality and tourism: A review of the literature. *Journal of Hospitality and Tourism Technology, 10*(4), 489–521. https://doi.org/10.1108/JHTT-08-2018-0087

Jiao, E. X., & Chen, J. L. (2019). Tourism forecasting: A review of methodological developments over the last decade. *Tourism Economics, 25*(3), 469–492. https://doi.org/10.1177/1354816618812588

Kang, J., Shin, H., & Kang, C. (2024). Hospitality labor leakage and dynamic turnover behaviors in the age of artificial intelligence and robotics. *Journal of Hospitality and Tourism Technology, 15*(5), 916–933. https://doi.org/10.1108/JHTT-12-2023-0411

Leung, X. Y. (2020). Technology-enabled service evolution in tourism: A perspective article. *Tourism Review, 75*(1), 279–282. https://doi.org/10.1108/TR-06-2019-0229

Li, M., Yin, D., Qiu, H., & Bai, B. (2021). A systematic review of AI technology-based service encounters: Implications for hospitality and tourism operations. *International Journal of Hospitality Management, 95*, 102930. https://doi.org/10.1016/j.ijhm.2021.102930

Li, Y., Wang, S., & Li, Z. (2024). Animating arousal and engagement: Empirical insights from AI-driven tourism performances. *Journal of Hospitality and Tourism Technology*, 15(5), 737–768. https://doi.org/10.1108/JHTT-01-2024-0053

Liao, Z., Gou, X., Wei, Q. & Xing, Z. (2024). Forecasting tourism demand with helpful online reviews. *Nankai Business Review International*, 15(4), 703–726. https://doi.org/10.1108/NBRI-10-2023-0097

Liu, H., Liu, Y., Wang, Y., & Pan, C. (2019). Hot topics and emerging trends in tourism forecasting research: A scientometric review. *Tourism Economics, 25*(3), 448–468. https://doi.org/10.1177/1354816618810564

Loureiro, S. M. C., Al-Ansi, A., Ryu, H. B., Ariza-Montes, A., & Kim, H. S. (2022). Culture, heritage looting, and tourism: A text mining review approach. *Frontiers in Psychology, 13*, 944250. https://doi.org/10.3389/fpsyg.2022.944250

Lv, H., Shi, S., & Gursoy, D. (2021). A look back and a leap forward: A review and synthesis of big data and artificial intelligence literature in hospitality and tourism. *Journal of Hospitality Marketing & Management, 31*(2), 145–175. https://doi.org/10.1080/19368623.2021.1937434

Lv, L., Chen, S., Liu, G. G., & Benckendorff, P. (2024). Enhancing customers' life satisfaction through AI-powered personalized luxury recommendations in luxury tourism marketing. *International Journal of Hospitality Management, 123*, 103914. https://doi.org/10.1016/j.ijhm.2024.103914

Mandić, D., Knežević, M., Borovčanin, D., & Vujko, A. (2024). Robotisation and service automation in the tourism and hospitality sector: A meta-study (1993–2024). *GeoJournal of Tourism and Geosites, 55*(3), 1271–1280. https://doi.org/10.30892/gtg.55327-1299

Osei, B. A., Ragavan, N. A., & Mensah, H. K. (2020). Prospects of the fourth industrial revolution for the hospitality industry: A literature review. *Journal of Hospitality and Tourism Technology, 11*(3), 479–494. https://doi.org/10.1108/JHTT-08-2019-0107

Palomo Santiago, M., & Parra López, E. (2024). Intellectual influence of smart tourism destinations 2000-2023. *Tourism and Hospitality Management, 30*(3), 301–316. https://doi.org/10.20867/thm.30.3.1

Rahmadian, E., Feitosa, D., & Zwitter, A. (2022). A systematic literature review on the use of big data for sustainable tourism. *Current Issues in Tourism, 25*(11), 1711–1730. https://doi.org/10.1080/13683500.2021.1974358

Samara, D., Magnisalis, I., & Peristeras, V. (2020). Artificial intelligence and big data in tourism: A systematic literature review. *Journal of Hospitality and Tourism Technology, 11*(2), 343–367. https://doi.org/10.1108/JHTT-12-2018-0118

Santiago, M. P., & López, E. P. (2024). Intellectual influence of smart tourism destinations 2000–2023. *Tourism and Hospitality Management*, 30(3), 301–316. https://doi.org/10.20867/thm.30.3.1

Saputra, F.E., Buhalis, D., Augustyn, M.M. & Marangos, S. (2024). Anthropomorphism-based artificial intelligence (AI) robots typology in hospitality and tourism. *Journal of Hospitality and Tourism Technology*, 15(5), 790–807. https://doi.org/10.1108/JHTT-03-2024-0171

Schuhbert, A., Thees, H., & Pechlaner, H. (2024). Deep and organizational learning as innovation catalyzer in digital business ecosystems: A scenario analysis on the tourism destination Berlin. *European Journal of Innovation Management*, 27(8), 2419–2456. https://doi.org/10.1108/EJIM-08-2022-0448

Soliman, M., Fatnassi, T., Elgammal, I., & Figueiredo, R. (2023). Exploring the major trends and emerging themes of artificial intelligence in the scientific leading journals amidst the COVID-19 era. *Big Data and Cognitive Computing, 7*(1), 12. https://doi.org/10.3390/bdcc7010012

Song, H., Qiu, R. T. R., & Park, J. (2019). A review of research on tourism demand forecasting: Launching the Annals of Tourism Research curated collection on tourism demand forecasting. *Annals of Tourism Research, 75*, 338–362. https://doi.org/10.1016/j.annals.2018.12.001

Sujood & Pancy (2024). Travelling with open eyes! A study to measure consumers' intention towards experiencing immersive technologies at tourism destinations by using an integrated model of TPB, TAM captured through the lens of S-O-R. *International Journal of Contemporary Hospitality Management, 36*(11) 3906–3929. https://doi.org/10.1108/IJCHM-11-2023-1771

Talukder, M. B., & Hoque, M. (2024). Navigating the digital horizon: Transforming travel agencies in the digital era. In Revolutionizing Hospitality, 250–270, IGI Global. https://doi.org/10.4018/979-8-3693-5966-2.ch014

Tussyadiah, I. (2020). A review of research into automation in tourism: Launching the Annals of Tourism Research curated collection on artificial intelligence and robotics in tourism. *Annals of Tourism Research, 81*, 102883. https://doi.org/10.1016/j.annals.2020.102883

Yang, J. J., & Chew, E. (2021). A systematic review for service humanoid robotics model in hospitality. *International Journal of Social Robotics, 13*(6), 1397–1410. https://doi.org/10.1007/s12369-020-00724-y

Yang, X., Zhang, L., & Feng, Z. (2024). Personalized tourism recommendations and the e-tourism user experience. *Journal of Travel Research*, 63(5), 1183–1200. https://doi.org/10.1177/00472875231187332

Ye, H., Sun, S., & Law, R. (2022). A review of robotic applications in hospitality and tourism research. *Sustainability, 14*(2), 827. https://doi.org/10.3390/su14020827

Yeh, C. C. R., Wong, C. C. J., Chang, W. W. V., & Lai, C. C. S. (2020). Labor displacement in artificial intelligence era: A systematic literature review. *Taiwan Journal of East Asian Studies*, 17(1), 25–75. https://doi.org/10.6163/TJEAS.202012_17(2).0002

Article history: Received: 03.03.2025 Revised: 22.05.2025 Accepted: 16.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1266-1278
DOI 10.30892/gtg.602spl23-1499

UNLOCKING SUSTAINABLE TOURISM THROUGH REGIONAL COLLABORATION: OPPORTUNITIES FOR ALBANIA AND THE WESTERN BALKANS

Árpád Ferenc PAPP-VÁRY [1*], Arjana KADIU [2], Zoltán SZABÓ [3]

[1]Budapest Business University, Faculty of International Management and Business, Department of Marketing, Budapest, Hungary; papp-vary.arpad@uni-bge.hu (A.F.P.V.)
[2]Aleksander Moisiu University, Department of Public Administration, Durres, Albania; arjanakadiu@uamd.edu.al (A.K.)
[3]University of Sopron, Alexandre Lamfalussy Faculty of Economics, Sopron, Hungary; szabo.zoltan@uni-sopron.hu (Z.S.)

Citation: Papp-Váry, Á.F., Kadiu, A., & Szabó, Z. (2025). Unlocking sustainable tourism through regional collaboration: Opportunities for Albania and the Western Balkans. *Geojournal of Tourism and Geosites*, 60(2spl), 1266–1278. https://doi.org/10.30892/gtg.602spl23-1499

Abstract: Natural landscapes, cultural heritage, and unique local experiences attract visitors to destinations worldwide – and Albania is no exception. Despite its late emergence as a tourist destination due to historical and political constraints, Albania's tourism sector has grown rapidly since 1990, becoming one of the country's most important industries. However, the pace and intensity of this growth have also raised concerns about long-term sustainability, particularly regarding environmental impact and cultural preservation. Today, sustainable growth is a critical priority – not only for Albania but for the entire Western Balkans region. The region shares common challenges and untapped opportunities, and an integrated approach may help unlock greater economic potential while advancing the principles of sustainable development. This study explores whether the development of an integrated Western Balkans tourism destination could support sustainability goals, while proposing a framework that balances economic growth with environmental and cultural preservation. Employing a mixed-methods approach, the research combines qualitative expert interviews with quantitative surveys targeting Albanian citizens and international visitors. The results reveal a significant correlation between investment in green technologies, education, and the belief that regional integration enhances sustainability. Albanian respondents demonstrated strong support for regional cooperation, while international visitors expressed greater satisfaction with the idea of multi-destination travel across the region—suggesting that cross-border tourism experiences are increasingly valued. These findings underscore the value of regional partnerships in fostering stakeholder engagement, promoting sustainable practices, and enhancing Albania's attractiveness as part of the Western Balkans. The study culminates in the creation of a Balanced Marketing Framework designed to support economic development while safeguarding cultural and environmental assets. This model integrates four core pillars: economic growth, environmental protection, social well-being, and regional collaboration. It offers practical guidance for policymakers and tourism stakeholders, emphasizing the need for dynamic destination management, investment in sustainable infrastructure, and cross-border knowledge exchange. Ultimately, the study illustrates the potential for sustainable tourism growth through regional cooperation and positions Albania's tourism strategy within a broader, collaborative future.

Keywords: sustainable tourism, regional collaboration, Albania, Western Balkans, marketing model, economic growth, stakeholder engagement, environmental protection

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INTRODUCTION

Tourism is an industry with immense potential for development across various regions of the world. Natural landscapes, cultural heritage, and unique local experiences attract visitors, contributing to economic growth and cultural exchange. This is particularly true for Albania, one of the world's ancient countries, situated in the Balkan Peninsula in southeast Europe. For much of the 20th century, Albania remained largely unknown to global tourists due to historical and political isolation. Unlike its neighboring countries, Albania's tourism sector began to develop only after 1990. Following the gradual transition to a market economy in the early 1990s and the rapid improvement of key economic indicators by the late 1990s, the Albanian government focused on maintaining macroeconomic stability, reducing poverty, and achieving sustainable, non-inflationary economic growth (Puci et al., 2023). Only after 1990, tourism has rapidly grown into a significant pillar of economic development. However, despite this growth, new challenges have emerged. Uncontrolled and intensive tourism, not aligned with the country's resources or long-term needs, risks undermining Albania's sustainable development goals.

Today, achieving a balance between economic growth, environmental preservation, and social well-being has become a universal objective for tourism development (Dwyer, 2020; Sharpley, 2020) Many countries are increasingly aligning their tourism strategies with the principles of sustainable development (Singh et al., 2024; Wani et al., 2024). This shift focuses on fostering harmony between visitor satisfaction, local community interests, and environmental protection. These goals are reflected in the United Nations Sustainable Development Goals (SDGs), particularly SDG 17, which emphasizes "partnerships for the goals" (Buhalis et al., 2023). Achieving sustainability is a formidable challenge for developing

* Corresponding author

countries like Albania, where economic growth often takes precedence. However, collaborative opportunities with neighboring countries may offer a pathway toward sustainable tourism.

This study investigates whether the integration of Albania into a collaborative Western Balkans tourism framework could promote sustainable development. A shared regional vision, harmonized legislation, and joint investment initiatives may enhance the economic and environmental resilience of the region. This aligns with the findings of Knežević et al. (2024), who highlight that Western Balkans economies can achieve greater competitiveness and sustainability in tourism by fostering regional collaboration, particularly in the post-COVID-19 context. Cela et al. (2022) argue that despite the Western Balkans' immense natural beauty and cultural diversity, the region lacks a cohesive regional branding strategy to position itself as a unified tourism destination. Their research highlights the necessity of developing a holistic marketing approach to strengthen regional brand identity and enhance sustainable tourism initiatives.

The present research focuses on exploring how tourism stakeholders in Albania perceive the potential of such collaboration and whether it could lead to balanced, long-term growth. The primary objective of this research is to design a sustainable marketing model that supports Albania's tourism development while fostering collaboration within the Western Balkans. The model aims to balance economic growth with environmental protection and social well-being, contributing to the broader goals of sustainable tourism. By investigating the perspectives of Albanian stakeholders, this study seeks to identify key elements necessary for harmonized regional tourism.

According to the UN World Tourism Organization (UNWTO), tourism is a social, cultural, and economic phenomenon that involves the movement of people to locations outside their usual environment for leisure, business, or professional purposes (UNWTO, 2024). In recent years, sustainability has become an integral part of this definition, emphasizing the importance of protecting the environment and respecting local communities. Sustainable tourism extends beyond visitor satisfaction; it prioritizes the long-term welfare of host communities and ecosystems.

As a developing country, Albania faces obstacles in achieving sustainability independently. The engagement of diverse stakeholders, including business owners, government agencies, residents, and researchers, is essential for overcoming these challenges. At the global level, collaborative opportunities and regional partnerships can accelerate this process. Therefore, this study examines whether an integrated Western Balkans destination can drive sustainable development in Albania and proposes strategic steps to achieve this vision. The methodology employed in this research includes both secondary and primary analysis, utilizing qualitative and quantitative approaches. The findings contribute to the development of a new marketing strategy model for Albania, which integrates four balanced pillars: economic growth, environmental preservation, social well-being, and regional collaboration. This model not only highlights the benefits of partnership but also envisions Albania as a resilient and sustainable tourism destination within the Western Balkans.

LITERATURE REVIEW

This section outlines the theoretical foundation of the study and highlights key knowledge that informs the central research question. The integration of theoretical insights with primary research results plays a crucial role in shaping a new marketing model for Albania. This model incorporates economic, environmental, and social dimensions, alongside the concept of Albania as part of an integrated Western Balkans destination.

International Tourism Development and Sustainability

In 2024, the tourism industry ranked among the world's ten largest sectors (IBISWorld, 2024), contributing significantly to both global economic performance and employment. According to the World Travel & Tourism Council (WTTC, 2025), the sector generated a total of US$10.9 trillion in global GDP - accounting for approximately 10% of the global economy. It also supported 357 million jobs worldwide, representing roughly 1 in every 10 jobs.

This remarkable growth is part of a long-term upward trend. As noted by the UN World Tourism Organization (UNWTO, 2020), international tourist arrivals surged from just 25 million in 1950 to 1.5 billion in 2019. Although this trajectory was temporarily disrupted by the COVID-19 pandemic beginning in late 2019, the recovery has been swift.

By 2024, international tourism had nearly fully rebounded. According to the UN Tourism World Tourism Barometer (January 2025), global tourist arrivals reached 99% of pre-pandemic levels, with many destinations even surpassing their 2019 performance.Tourism has become a transformative force, influencing economies, societies, and environments. As Williams (2014) notes in "Tourism Geography", tourism touches almost every corner of the globe, shaping both landscapes and communities. In the early stages of the tourism boom, little attention was given to its environmental or socio-cultural impacts. Today, however, the global community faces a "triple planetary crisis" of climate change, biodiversity loss, and pollution, as highlighted in the Global Foresight Report by UNEP and the International Science Council (UN Environment, 2024). Tourism is not a static or isolated phenomenon; it reflects broader patterns of development and change. As Williams (2009) points out, tourism can drive socio-cultural transformation by influencing and being influenced by diverse participants and institutions. The interplay between economic growth, social well-being, and environmental protection aligns with the triple bottom line framework, emphasizing sustainable development as a global priority (Savitz & Weber, 2013b). The interconnected nature of global issues such as deforestation, water scarcity, pandemics, and poverty underscores the urgency for sustainable practices. Awareness is growing, particularly among younger generations, who are increasingly engaged in sustainability efforts. This era of sustainability demands collective action to secure a better future for all (Savitz & Weber, 2013a).

The Triple Bottom Line and Sustainable Development Goals

Interpretations of sustainability range from zero-growth perspectives, which advocate against development, to approaches that emphasize technology and resource management to achieve sustainability (Wall & Mathieson, 2006). Sharpley (2009) advocates for an integrated approach that considers economic, social, political, cultural, and ecological contexts, prioritizing long-term impacts and ethical considerations. Despite skepticism regarding the true sustainability of tourism (Hall & Page, 2006; Weaver, 2005), there is consensus that growth managed within resource limits offers the best path forward. Murphy (2005) outlines essential principles for sustainable tourism development, including:

- Ensuring renewable resources are not depleted faster than they can be replenished.
- Protecting and maintaining biodiversity.
- Valuing the aesthetic and cultural appeal of environments.
- Respecting local cultures and involving communities in development processes.
- Promoting equity in the distribution of tourism benefits and costs.

These foundational principles continue to shape the modern definition of sustainable tourism, which emphasizes the need to balance economic, social, and environmental dimensions (UNWTO, 2024b).

Tourism in Albania and The Challenge of Sustainable Development

Albania's future lies in sustainable tourism development. While the strategies may differ between developed and developing countries, the importance of sustainable growth remains universal. Albania's diverse landscape - featuring coastlines, lakes, and mountains within 28,000 square kilometers - presents opportunities for year-round tourism. With a growing number of visitors, Albania is expanding its tourism infrastructure while striving to maintain a balance with sustainability (Euronews, 2025). Overdevelopment and economic dependency on tourism pose risks to long-term stability. Similar challenges are faced globally in protected natural areas, where increasing tourist flows threaten the ecological integrity of fragile ecosystems (Artemyev et al., 2025; Malatyinszki et al., 2024). As Remenyik et al. (2025) highlight tourism must go beyond balancing growth with sustainability by actively redefining its relationship with nature and local communities. Integrating ecotourism and circular economy principles - such as green energy, closed-loop systems, and cultural engagement - not only reduces environmental impact but also strengthens long-term competitiveness.

Albania was among the first countries to surpass pre-pandemic tourism levels in 2023, attracting significant investment and global interest. With over 21 tourism projects valued at EUR 3.09 billion, Albania is positioning itself as a premier Mediterranean destination (UN Tourism, 2024a). As Bayona (2024), Executive Director of UN Tourism, states, "Investing in Albania is a guide to action, inviting stakeholders to explore the country's rich potential." Tourism's contribution to Albania's GDP rose from 19.9% in 2013 to 27.8% in 2023, creating jobs and boosting national income (Figure 1).

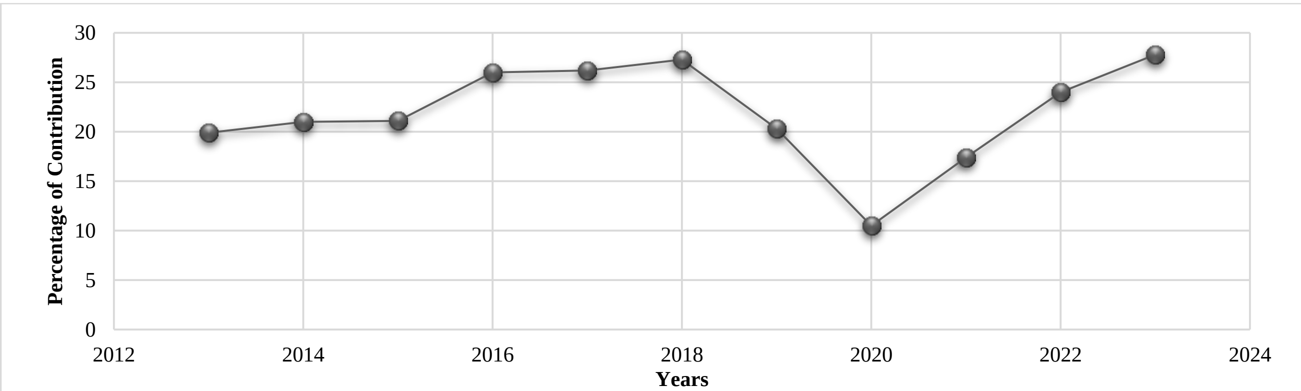

Figure 1. Total contribution of tourism to Albania's GDP
(Source: Albanian Ministry of Tourism (2023), INSTAT (2023), WTO (2024), WTTC (2024)

Table 1 highlights the rising income generated by tourism-related industries between 2020 and 2023. As part of efforts to promote sustainable tourism growth, more than 260 agro-tourism structures have been established across Albania, according to the Deputy Minister of Albania (RTSH, 2025a). However, achieving a balance between economic development, environmental protection, and social equity remains a significant challenge.

Table 1. Incomes generated from travel and tourism (Source: Albanian Ministry of Tourism 2023, INSTAT 2023)

Years	**2020**	**2021**	**2022**	**2023**
Industries (total) /000 Albanian Leke	**42,123**	**52,654**	**73,853**	**87,706.20**
Accommodation and Food service industry	34,463	44,104	61,985	72,735.80
Leasing activities	1,971	2,034	2,190	3,255.90
Travel agencies, tour operators, and other reservation activities	5,689	6,516	9,678	11,714.50

Sustainable development, as defined by the Brundtland Report (1987), emphasizes meeting present needs without compromising future generations. Achieving this requires collaboration across sectors and coordinated policy efforts at national and international levels (UNWTO, 2024b). Albania's focus on economic growth often diverts attention from environmental and social concerns, posing risks to long-term sustainability (Table 2).

Table 2. Summary of present economic, environmental, and social challenges in Albania (Source: Source: INSTAT (2021), WB (2022), Halili (2022), The Guardian (2017)

Economic	Environmental	Social & others
Past centralised economy	The absence of regular public transport increases air pollution	Lack of awareness about environmental issues
Long transition phase	Poor air quality in the region of Western Balkans	Increased middle-class emigration
Agriculture dominated economy	Unstudied construction at the expense of green spaces	Limited knowledge about the S.D.G most sectors
High corruption	Extensive use of coal for energy production	Discrepancy between legislation and capacity
High unemployment rate	Underfunded and malfunction of EMS	Absence of studies regarding air pollution and people's health
Extreme poverty rate	Poor waste infrastructure and management	No common framework including principles of a green economy
Poor healthcare system	Reduction in forest volume	Gender inequality
Natural disasters require a large budget	Lack of effective river basin-based water management	Quality of Education
No appointed unit, in the central government structure for environmental taxes	Natural disasters	Risk of commercialization of culture
Acquisition of expensive technologies related to SD	Slow implementation of legal framework for biodiversity	Risk of traditions' loss

The Opportunity of the Western Balkans

Regional collaboration is essential for achieving sustainable development goals, particularly in the tourism sector. The Western Balkans, comprising Albania, Bosnia and Herzegovina, North Macedonia, Kosovo, Montenegro, and Serbia, represents a region of immense potential. With a combined GDP nearing EUR 100 billion and a population of 20 million, the region's unique cultural and natural assets present significant opportunities for economic integration and sustainable growth (OECD, 2021). Enhanced collaboration across trade, investment, and mobility has already driven economic progress and regional stability. Initiatives led by the European Union have facilitated cooperation, while National Investment Committees across the Balkans track progress on shared projects. Table 3 summarizes the benefits of a collaborative Western Balkans tourism strategy.

Table 3. Benefits from a collaboration of the Western Balkan countries (Source: own research and analysis based on the literature, 2023)

Benefits from a common region
Larger economies are more appropriate for major investments
A diverse destination may be more interesting than one country only
A single investment space with harmonising legislation will ease large investments
Improved reputation of collaborating countries
Trade agreements will facilitate economic transactions
Increased trust among each other, tourists, and outside investors
Improved stability of the region
Higher engagement toward sustainability
Easier approach to global sustainability goals
Employee exchange and skill development
Cultural diversity within a destination

Various types of tourism are currently developing across the Western Balkans region, including coastal ("sea and sand") tourism, cultural tourism, eco-tourism, adventure tourism, and authentic local experiences. However, there is significant potential to further diversify tourism offerings, particularly in areas such as agricultural tourism, MICE tourism (Meetings, Incentives, Conferences, and Events), and wellness and fitness tourism.

These alternative forms remain underdeveloped and warrant greater exploration and investment. A recent example of regional potential is the Trans Dinarica route, promoted by GIZ Albania through social media. This iconic 5,500 km cycling corridor traverses national parks, UNESCO World Heritage sites, and historic villages, showcasing the rich cultural heritage and cuisine of the Balkans. The route connects all Western Balkan countries, representing a unique opportunity for sustainable, cross-border tourism development (RTSH, 2025b).

Health tourism presents another unique opportunity for Balkan countries to enhance their global visibility, as Sziva et al. (2017) argue that countries in the region possess significant potential in this sector. However, as they note, effective brand positioning is necessary to create competitive differentiation, particularly through online communication platforms.

A unified investment space, harmonized legislation, and barrier-free markets can strengthen capital flows and attract foreign investment. Such initiatives foster regional stability and sustainability, aligning with Confucius' timeless wisdom: "Be in harmony yet be different." There is no one-size model that fits all regarding green development, but collaboration and adaptation are necessary to move forward (Kadiu et al., 2022). As the Western Balkans seeks sustainable growth, preserving cultural diversity while promoting collective progress remains a guiding principle.Achieving harmony across multiple dimensions is essential for sustainable growth. This includes fostering collaboration among stakeholders – businesses, governments, and local communities – as well as nurturing positive relationships between visitors and hosts to enhance tourist experiences while safeguarding local interests (Carida et al., 2022) Regional harmony is equally important, as it supports cross-border partnerships that generate shared economic and environmental benefits (Paiva et al., 2025; Duda, 2024). By addressing these interconnections, Albania and the Western Balkans can develop a sustainable tourism model that not only enhances economic prosperity but also safeguards cultural heritage and natural resources.

MATERIALS AND METHODS

The methodology employed in this study integrates both secondary and primary research approaches to provide a comprehensive understanding of the topic. This dual approach allows for in-depth analysis and robust interpretation of the data, ensuring a well-rounded exploration of sustainable tourism development in Albania. That aligns with Çinaj et al. (2022), who combined stakeholder interviews with official documentation to assess the perception of safety and security within Albania's tourism sector. In the present study a mixed-methods approach was utilized, combining qualitative and quantitative data to enable triangulation and enhance the validity of findings. This methodological framework ensured that insights from existing literature were complemented by empirical data collected from primary research (Neuman, 2013).

Secondary research involved an extensive review of academic journals, books, and credible online sources. This literature review formed the foundation for developing a model that interrelates environmental protection, economic growth, human well-being, and regional collaboration as key pillars for sustainable tourism development in Albania.

For primary research, first of all, ten semi-structured interviews with experts in marketing, tourism, and sustainability were conducted. These experts, drawn from both public and private sectors, possess significant practical and theoretical knowledge in the field. The interviews aimed to explore current trends, challenges, and opportunities in sustainable tourism. According to Mayring (2015b), qualitative content analysis is a suitable method for evaluating expert interviews, as it facilitates the systematic analysis of themes, phenomena, and patterns (Ritschl, 2016).

The interviews were designed based on the study's research questions and initial theoretical insights. Key themes included economic, ecological, and social factors influencing sustainable tourism development. The results were analyzed using Mayring's (2015a) qualitative content analysis methodology.

Following the qualitative phase, two hypotheses were formulated to guide the quantitative analysis:

H1: The belief in investing in green development in Albania is associated with the belief that an integrated Western Balkan enhances engagements toward sustainability.

H2: The perception that a tour combining different destinations in the Western Balkan countries is a desirable choice for the respondents is associated with the belief that their touristic trip to Albania is satisfactory.

To test these hypotheses, two quantitative surveys were distributed and analyzed using statistical methods. This empirical approach enabled the integration of quantitative results into the proposed marketing model for sustainable tourism development in Albania. Quantitative analysis followed a structured process:

- Descriptive Analysis – to summarize and describe the main features of the dataset.
- One-Way Analysis of Variance (ANOVA) – to determine if there were significant differences between groups.
- Correlational Analysis – to assess the strength and direction of relationships between variables.
- Multivariable Linear Regression Analysis – to explore the predictive relationship between independent and dependent variables.

Ethical considerations were integral to the research process. Informed consent was obtained from all participants, and strict measures were implemented to ensure the confidentiality and security of collected data. Participants were informed of their rights, and all data collection procedures adhered to established ethical guidelines.

The key ethical guidelines followed in this process were:

a. Informed consent: Participants were informed about the purpose of the research and assured that their participation was voluntary. Verbal or written consent was obtained.

b. Anonymity and data protection: The identities of participants in the primary quantitative research were protected through data anonymization. Participants retained the right to withdraw their data prior to final analysis. All data were handled using password-protected devices.

c. Minimizing discomfort: Questions that could potentially cause discomfort were avoided, and both professional and personal boundaries were respected throughout the research process.

d. Transparency: The aims of the research and the intended use of the data for publication were clearly communicated to all participants.

e. Reciprocity and respect: In recognition of their time and contributions, participating experts were acknowledged and offered access to the research findings or final publication, where appropriate.

RESULTS

Results of the Qualitative Analysis

The qualitative interviews conducted for this study played a significant role in shaping the hypotheses. These insights were subsequently validated through statistical tests and quantitative survey analysis, reinforcing the alignment between expert opinions and broader respondent data.

The insights from Table 4 summarize the primary results of the expert interviews, highlighting critical areas such as tourism growth, sustainability, and the potential of a unified Western Balkans tourism destination.

Table 4. Key findings from expert interviews (Source: Kadiu (2024) Marketing Strategies promoting Sustainable Tourism Development in the country of Albania, Doctoral Dissertation, University of Sopron, p. 106)

Focus Area	Key Insights
Tourism Development in Albania	- Tourism must be prioritized as a key sector contributing significantly to Albania's economic growth
	- Despite economic challenges, embracing sustainable tourism development is essential
	- Active engagement among stakeholders is crucial to fostering adaptive strategies for sustainable development
	- Development must strike a balance between economic growth, environmental preservation, and societal well-being
	- Negative practices, such as unregulated hydropower projects and overdevelopment in tourist areas, must be carefully managed
Sustainable Development& a Common Western Balkans Destination	- Regional collaboration generates added value and enhances sustainability initiatives
	- Preventing over-tourism requires meticulous planning and capacity assessments
	- Conducting carrying capacity studies is essential to inform sustainable development strategies
	- Stakeholders engaged in green development express strong support for integrating Albania into a unified Western Balkans tourism region
Tourism Marketing Strategy for Albania	- Developing a tourism marketing strategy that integrates sustainability is critical for Albania's long-term success
	Including the concept of a shared Western Balkans destination in the national strategy can provide additional benefits, advancing the path to sustainability

Results of the Quantitative Analysis

The quantitative analysis presents the findings from surveys conducted with Albanian citizens and foreign travelers. This section details the results of the national (domestic) sample survey and highlights key statistical outcomes.

Nationals Sample Survey

Survey responses were collected through the "Question Pro Survey" platform and analyzed using SPSS Statistics software. The questionnaire was structured around five primary pillars: Albania's natural resources, economic challenges, the Balkans region, integrated Western Balkans destinations, and sustainability.

Descriptive Statistics and Analysis

A total of 685 responses were completed out of 936 submissions, yielding a completion rate of 63.36%. The demographic breakdown, presented in Table 5, highlights key characteristics of the national sample.

The domestic survey sample was characterized by a notable gender imbalance, with women comprising 72% of the respondents. Age distribution was skewed toward younger participants, with nearly half (47.7%) aged 25 or younger, followed by 27.2% aged 26–41, and 23.1% aged 42–57. In terms of educational attainment, the majority held higher education degrees. Employment sector data show a balanced split, with 42.2% working in the private sector and 38.7% in the public sector. This demographic and socio-economic profile provides important context for interpreting attitudes toward sustainability, tourism development, and regional cooperation.

Table 5. Questionnaire Data – Domestic (Albanian) Sample (Source: authors' research and analysis, 2023)

The questionnaire was viewed	1361
Total responses	936
Responses completed	685
Completion rate	63.36%

One-Way Analysis of Variance (ANOVA)

The ANOVA analysis assessed the relationship between the belief that an integrated Western Balkans enhances sustainability engagement (dependent variable) and the perception of investing in green technologies and education (independent variable). The results, summarized in Table 6, show a statistically significant association at the 0.05 level, indicating that investments in green development correlate with enhanced sustainability engagement.

Table 6. Anova analysis: domestic sample (Source: authors' research and analysis, 2023)

Anova [a b]					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	21.115	4	5.279	4.515	.001 [b]
Residual	795.075	680	1.169		
Total	816.190	684			

a. Dependent Variable: ID b. Predictors: (Constant), What is your highest completed education grade, SC, Gender, Age group

Pearson Chi-Square Test

The Pearson Chi-Square analysis further confirmed a significant relationship between the belief in green investments and the perception of enhanced sustainability through regional collaboration. Table 7 presents the Chi-Square test results, highlighting a highly significant association ($p < .001$). This analysis assesses hypothesis 1, which refers to the association between respondents' perception of investing in innovative technologies and education related to green development with the belief that an integrated Western Balkans enhances engagement toward sustainability.

Table 7. Chi-Square Tests: domestic sample (Source: authors' research and analysis, 2023)

Chi-Square Tests			
Value		df	Asymptotic Significance (2-sided)
Pearson Chi-Square	53.493 [a]	20	<.001
Likelihood Ratio	50.930	20	<.001
Linear-by-Linear Association	15.388	1	<.001
N of Valid Cases	685		

Multivariable Linear Regression

Regression analysis demonstrated a positive and statistically significant relationship between investments in green development and the belief that an integrated Western Balkans enhances sustainability engagement ($B = 0.156$, $p < .001$). This association remains robust even when controlling for demographic factors such as gender, age, and education level.

These findings provide substantial evidence to reject the null hypothesis, reinforcing the connection between green investment initiatives and regional collaboration for sustainable tourism development in Albania.

Table 8. Multivariable linear regression analysis: domestic sample (Source: authors' research and analysis)

Variables	B	ß	SE B	t	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound
Constant	3.938***		0.261	15.087	3.425	4.45
Investing in green development	0.156***	0.149***	0.04	3.914	0.078	0.234
Gender	0.138**	0.057**	0.093	1.477	-0.045	0.322
Age group	0.005	0.004	0.055	0.093	-0.103	0.113
Education	-0.016	-0.012	0.06	-0.273	-0.133	0.101
R square			0.026			
Adjusted R square			0.02			

Internationals sample survey

The responses for the international survey were collected using the "Question Pro Survey" platform and analyzed with SPSS Statistics software. The survey targeted visitors to Albania and potential travelers interested in visiting the country. A total of 249 respondents participated in the international survey. The primary data are presented in Table 9.

Table 9. Questionnaire Data –International (non-Albanian) Sample (Source: authors' research and analysis)

The questionnaire was viewed	387
Total responses	249
Responses closed	249
Completion rate	87.55%

The income distribution of international respondents reveals a relatively affluent participant base. A substantial portion (40.6%) reported an annual income above €20,000, while 28.9% fell within the €12,000–€20,000 range. Only a small share of participants reported lower income levels, with 9.6% earning between €5,000 and €12,000, and just 6.4% earning less than €5,000 annually. This distribution suggests that the majority of surveyed international visitors represent middle- to upper-income groups, which is relevant when assessing their tourism preferences and spending behaviors.

The key variables of interest concerning the potential for sustainable tourism development through an integrated Western Balkans destination are the perception of a satisfactory trip to Albania and the perception that a tour combining different destinations of the Western Balkans is a good option for travelers.

One-Way Analysis of Variance (ANOVA)

The analysis assesses hypothesis 2, aiming to find whether there is a significant association between the dependent variable—satisfaction with trips to Albania—and the independent variable—the belief that a tour combining destinations across the Western Balkans would be a desirable option for travelers. The results of the ANOVA for the international sample are presented in Table 10.

Table 10. Anova analysis: international sample (Source: authors' research and analysis)

Anova[a b]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.548	3	1.183	13.759	<.001[b]
	Residual	17.709	206	.086		
	Total	21.257	209			

a. Dependent Variable b. Predictors: (Constant), Age, Independent Variable

If the relationship were not statistically significant, there would be no evidence to confirm hypothesis 2. However, the results indicate a statistically significant association between the two primary variables. The perception of a satisfying trip to Albania increases the likelihood that respondents would prefer a combined tour of Western Balkans destinations. The mean difference is significant at the 0.05 level.

Pearson Chi-Square Test

The Chi-square test evaluated the association between overall satisfaction with a trip to Albania and the belief that a tour combining various Western Balkans destinations would be a desirable option for travelers.

Table 11 presents the results of the Chi-square test. The results confirm a statistically significant association between overall satisfaction with a trip to Albania and the belief in the value of a Western Balkans combined destination tour. Both perceptions align positively, reinforcing hypothesis 2.

Table 11. Chi-Square tests: international sample (Source: authors' research and analysis, 2023)

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	37.050[a]	4	.000
Likelihood Ratio	27.899	4	.000
Linear-by-Linear Association	29.052	1	.000
N of Valid Cases	215		

Multivariable Linear Regression Analysis

Multivariable linear regression analysis was conducted to further assess the association between perceptions of an integrated Western Balkans destination and satisfaction with Albania's tourism. Table 12 presents the results.

Hypothesis 2 proposed that individuals who view a combined Western Balkans tour favorably are more likely to express satisfaction with their trip to Albania. The analysis revealed that a one-unit increase in the belief that such a tour is desirable corresponds to a 0.135 increase in satisfaction with trips to Albania. These findings indicate that perceptions of an integrated Western Balkans region contribute to higher levels of satisfaction with tourism experiences in Albania. The null hypothesis—suggesting no association between these variables—was rejected at the 0.001 significance level, while controlling for demographic factors to ensure precision. This highlights the potential for Albania's tourism sector to benefit from collaborative regional strategies, fostering greater development, growth, and sustainability.

Table 12. Multivariable linear regression of association between perception of WB combined destination tour as a good option and satisfaction with touristic trip to Albania (Source: authors' research and analysis)

Variables	B	ß	SE B	t
Constant	0.331**	0.127**		2.6
WB combined destination tour	0.135***	0.024***	0.36	5.64
Income	0.054*	0.024*	0.155	2.211
Age	-0.005*	0.002*	-0.157	-2.245
R square			0.167	
Adjusted R square			0.155	

Key Findings and Strategic Implications

Findings from both samples revealed consistent views regarding the benefits of an integrated Western Balkans destination and its potential contribution to sustainable tourism and economic growth in Albania. The statistically significant results from both national and international respondents highlight critical insights that could inform strategies for sustainable tourism development. Albanian respondents expressed that the concept of an integrated Western Balkans destination fosters greater engagement with sustainability initiatives. This perspective aligns with their belief in investing in innovative technologies and education related to green development. A stronger belief in green development correlates with the perception that regional collaboration enhances sustainability efforts. The regression analysis indicates a positive slope of 0.156, confirming the statistical significance of this relationship.

Similarly, international respondents who viewed a multi-destination tour across the Western Balkans as desirable also reported higher satisfaction with their trips to Albania. The analysis shows that a one-unit increase in the belief that such a tour is a good option corresponds to a 0.135 increase in satisfaction with tourism experiences in Albania.

Figure 2 illustrates the association between these key variables, derived from empirical research. These findings reinforce the notion that fostering regional partnerships and integrated tourism offerings supports sustainable tourism growth and economic development in Albania. This conclusion aligns with the United Nations Sustainable Development Goal 17 (UN, 2023), which emphasizes the importance of strengthening global partnerships to achieve sustainable development. By investing in green technologies and educational initiatives, Albania and the Western Balkans can collectively advance their sustainability objectives, contributing to long-term economic resilience.

The Balanced Marketing Model for Sustainable Tourism Development in Albania

The foundation of Albania's new tourism marketing strategy lies in showcasing the country's rich offerings, encouraging tourists to slow down, reconnect, and explore unique places while engaging with extraordinary local communities.

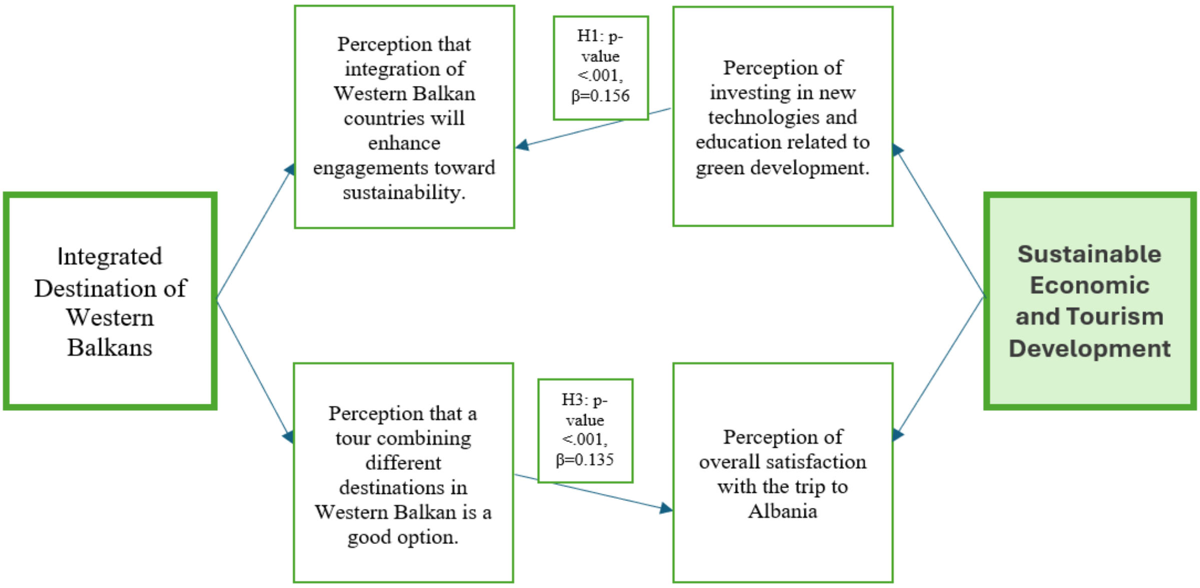

Figure 2. Association Between Key Variables Analyzed Through Empirical Research (Source: Kadiu (2024) Marketing Strategies promoting Sustainable Tourism Development in the country of Albania, Doctoral Dissertation, University of Sopron)

However, the key challenge is fostering tourism growth that respects and preserves the environment and the cultural heritage of local populations. The integration of the Western Balkans presents a significant opportunity, offering Albania and its neighboring countries a pathway to collective advantages in sustainable tourism and broader economic development. The Balanced Marketing Model, illustrated in Figure 3, was developed through insights gained from the literature review and empirical survey results. This model addresses the central research question: What framework can guide the marketing strategy for sustainable tourism development in Albania?

The model emphasizes the critical role of tourism stakeholders, urging them to collaborate actively in the development process. As Aman et al. (2024) highlight, destinations must adopt innovative and sustainable branding strategies to address environmental concerns, meet changing visitor expectations, and remain competitive in the global tourism market. These insights further support the rationale behind Albania's Balanced Marketing Model.

The model also highlights the importance of the market offering—comprising essential elements aimed at enhancing performance and delivering value not only to tourists but also to industry players and local collaborators.

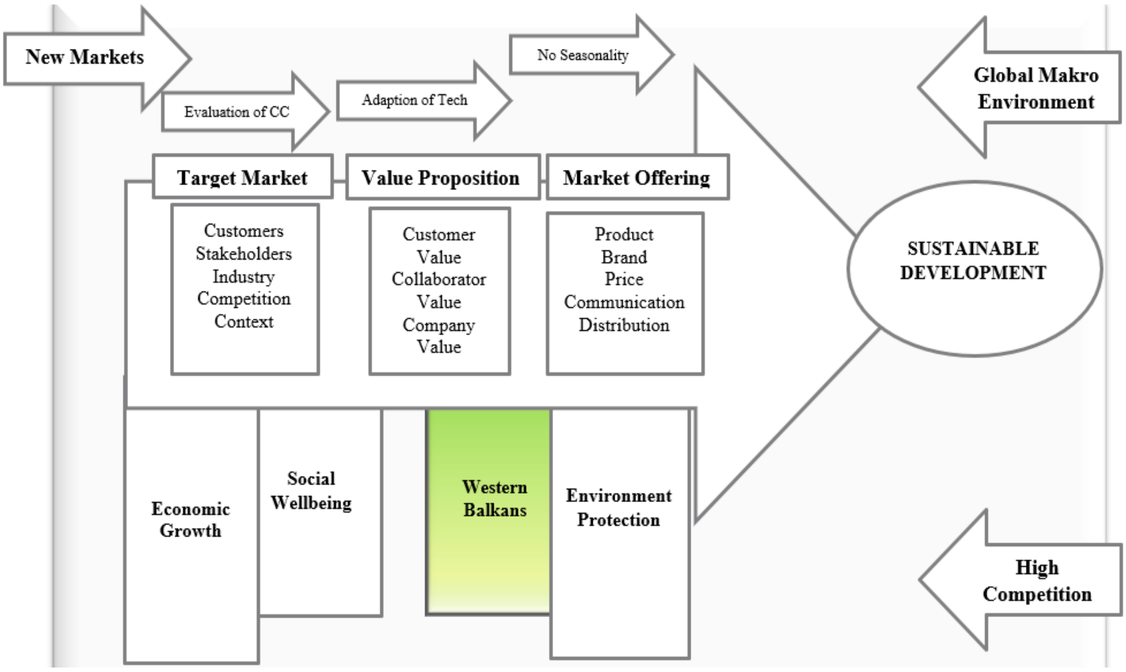

Figure 3. The Balanced Marketing Model for Sustainable Tourism Development in Albania (Source: Kadiu (2024) Marketing Strategies promoting Sustainable Tourism Development in the country of Albania, Doctoral Dissertation, University of Sopron)

Based on: Chernev (2019), Kotler et al. (2022), Chernev & Kotler (2018), UNWTO (2022), UNWTO (2019), World Trade Organization (2017), Williams & Lew (2014), WTTC, Albania (2022)

At the core of the model are four equally weighted pillars. While three align with globally recognized pillars—economic growth, environmental preservation, and social well-being—a fourth pillar specific to Albania emphasizes regional collaboration among the six Western Balkan countries, including Albania.

These four pillars are of equal significance and must remain in balance throughout the development process to ensure sustainable tourism growth. This holistic approach not only aligns with global sustainability practices but also leverages regional partnerships, fostering shared progress and long-term resilience.

DISCUSSION

The Western Balkans, positioned at the crossroads between Eastern and Western Europe, remains a region marked by economic, environmental, and social vulnerabilities. Despite notable progress, countries within this region continue to grapple with persistent challenges. A comprehensive understanding of each country and the broader region is essential for fostering collaboration and sustainable growth. International researchers often view the Western Balkans as a fragmented region for study, facing challenges such as limited infrastructure and the politicization of certain topics (Dzankic, 2023). However, as Petrov & Dimitrov (2022) note, while infrastructural deficits remain, investments in sustainable tourism corridors between Albania, Montenegro, and North Macedonia have begun to address these challenges by facilitating eco-tourism routes. Also, as noted by Williams (2014), tourism can drive socio-cultural and economic transformation in regions that actively engage in sustainable practices and collaboration. This reflects the potential for tourism to serve as a unifying force, fostering development even in resource-constrained areas.

This study aimed to establish a link between regional collaboration within the Western Balkans and sustainable tourism development. Findings align with prior research emphasizing the value of cooperation in sectors like tourism, energy, and finance. Regional integration and collective promotion of tourism, as highlighted by The Balkan Forum (2024), could significantly enhance economic stability and generate long-term growth for each nation.

This aligns with recent findings by Knežević et al. (2024), who emphasize that cross-border tourism initiatives in the Western Balkans not only enhance economic performance but also encourage sustainable environmental practices by pooling resources across borders. Economic growth in the Western Balkans has accelerated in recent years, outpacing Western Europe and the EU average (Uvalić, 2023). This economic upswing can be attributed to the EU’s unilateral trade liberalization in 2001, which bolstered exports and deepened economic integration. Nonetheless, Kennell et al. (2021) stress that such growth must align with sustainable tourism policies, ensuring that the rapid expansion of the sector does not undermine environmental and social well-being. Kontic & Maksimovic (2023) further emphasize that tourism plays a crucial role in driving economic growth in the Western Balkans.

Their research demonstrates a direct relationship between tourism, renewable energy consumption, and economic expansion, reinforcing the importance of sustainable practices for long-term development.

Despite notable gains, individual Western Balkans countries remain vulnerable to sustainability challenges. As Porfido (2020) notes, tourism plays a central role in economic development across the region, but a collective approach is necessary to stabilize growth and mitigate risks associated with fragmented efforts. A shared regional tourism framework could support more sustainable progress, ensuring that no single country bears the burden alone.

Visegrad Insight (2022) outlines five potential scenarios for the Western Balkans by 2030, all emphasizing the necessity of cooperation to secure a prosperous future. Even in less optimistic scenarios, regional collaboration is seen as a critical mechanism for stability and resilience. The "banding together" scenario, if embraced by all six countries, could catalyze regional development, reinforcing sustainable tourism initiatives.

Global challenges, including climate change and economic instability, are reshaping the tourism landscape. Caporale et al. (2023) found that the COVID-19 pandemic significantly altered tourism patterns in Southeastern Europe, including Albania, by increasing persistence and diminishing seasonal trends. This disruption highlights the need for adaptive strategies in the region’s tourism planning to counterbalance long-term structural changes in tourist arrivals and overnight stays. This mirrors Williams & Lew’s (2014) assertion that tourism is both a driver and a consequence of socio-economic change, reinforcing the importance of regional partnerships in addressing future crises.

The perspectives of Albanian stakeholders gathered in this study reflect a shared belief that regional collaboration is essential for advancing sustainable tourism and economic growth. Respondents indicated a strong willingness to invest in green technologies, education, and sustainable practices if Albania becomes part of a broader Western Balkans framework. This aligns with Savitz (2013b), who notes that sustainable development flourishes through integrated, long-term strategies involving multiple stakeholders. If these strategies are embraced by the entire Balkan region, they would provide a significant advantage. An integrated destination is perceived as more compact and secure, fostering trust among travelers. The future should not be seen as a dilemma between economic growth and environmental protection but rather as a commitment to both simultaneously (Kadiu, 2021).

Albanian tourism industry stakeholders recognize the country’s potential but also acknowledge gaps in public awareness regarding sustainability. Bridging this knowledge gap requires collaboration between local and international researchers, policymakers, and private sector leaders. As UNWTO (2024) emphasizes, sustainable tourism development must address economic, environmental, and socio-cultural aspects to ensure long-term viability.

Ultimately, the development of an integrated Western Balkans tourism destination is inextricably linked to sustainability and stakeholder collaboration. If embraced by governments, businesses, and local communities, this approach could foster inclusive growth and long-term prosperity.

CONCLUSION

This study highlights the significance of regional collaboration in fostering sustainable tourism development in Albania and across the Western Balkans. By integrating quantitative and qualitative findings, the research underscores that cooperation among countries in the region can drive economic growth, environmental sustainability, and long-term resilience. The quantitative analysis revealed a strong link between Albanian respondents' belief in investing in green technologies and education and their perception that an integrated Western Balkans enhances sustainability efforts. A positive correlation indicates that greater investment in sustainable practices aligns with broader regional collaboration goals. Similarly, international respondents who favored multi-destination tours within the Western Balkans expressed higher satisfaction with their travel experiences in Albania.

A central contribution of this study is the Balanced Marketing Framework, designed to guide Albania's sustainable tourism strategy. This framework introduces a fourth pillar—regional collaboration—alongside the established pillars of economic growth, environmental protection, and social well-being. By emphasizing cooperation among the six Western Balkans countries, the model aims to leverage shared resources, promote cross-border tourism, and drive long-term development. The findings align with the United Nations Sustainable Development Goal 17 (UN SDG 17), which highlights the importance of partnerships to achieve sustainable development. This study affirms that Albania’s path toward sustainable tourism depends on fostering closer ties with neighboring countries, investing in green technologies, and advancing educational initiatives focused on sustainability. Based on the findings, the following recommendations are proposed to support sustainable tourism in Albania and the Western Balkans:

- Dynamic Destination Management: Implement adaptive frameworks to monitor visitor capacity, preserve resources, and prevent overcrowding.
- Impact Monitoring: Continuously assess tourism’s environmental and social impacts to inform policy decisions and ensure long-term sustainability.
- Waste Management and Renewable Energy: Invest in waste management infrastructure and renewable energy initiatives to minimize tourism’s environmental footprint.
- Cultural and Local Engagement: Promote local products, cultural heritage, and community-based tourism to enhance visitor experiences and stimulate local economies.
- Knowledge Sharing and Education: Foster cross-border collaboration among researchers, policymakers, and industry leaders to advance sustainability awareness and best practices.
- Sustainable Infrastructure: Regulate tourism infrastructure development to align with sustainability goals, preventing overdevelopment and preserving cultural heritage.

This study concludes that Albania’s path to sustainable tourism lies in strengthening regional partnerships within the Western Balkans. By embracing collaboration, investing in green technologies, and promoting sustainability-focused education, Albania can enhance its tourism sector, attract greater investment, and contribute to regional stability. The Balanced Marketing Framework developed through this research offers a strategic roadmap for achieving these objectives,

Author Contributions: Conceptualization, A.K; methodology, Á.F.P.V., A.K and Z.Sz.; software, Á.F.P.V., A.K and Z.Sz; validation, Á.F.P.V., A.K and Z.Sz; formal analysis, A.K; data curation, Á.F.P.V., A.K and Z.Sz; writing - original draft preparation, A.K; writing - review and editing, Á.F.P.V., A.K and Z.Sz; visualization, A.K; supervision, Á.F.P.V. and Z.Sz.; project administration, Á.F.P.V. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgements: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Aman, E. E., Papp-Váry, Á. F., Kangai, D., & Odunga, S. O. (2024). Building a Sustainable Future: Challenges, Opportunities, and Innovative Strategies for Destination Branding in Tourism. *Administrative Sciences*, 14(12), 312. https://doi.org/10.3390/admsci14120312

Artemyev, A., Abdreyeva, S., Baiburiev R., Beisakhmet, A., Kaliyeva A., Abzhapparova, A., Savanchiyeva, A., & Dávid, L. D. (2025). Study of the tourist and recreational load in the “Kolsai Lakes” State National Nature Park, Kazakhstan. *Geojournal of Tourism and Geosites*, 58(1), 9–17. https://doi.org/10.30892/gtg.58101-1386

Bayona, N. (2024). Investing in Albania. https://www.unwto.org/investment/tourism-doing-business-investing-in-albania

Buhalis, D., Leung, X. Y., Fan, D., Darcy, S., Chen, G., Xu, F., Wei-Han Tan, G., Nunkoo, R., & Farmaki, A. (2023). Editorial: Tourism 2030 and the contribution to the sustainable development goals: the tourism review viewpoint. *Tourism Review*, 78(2), 293-313. https://doi.org/10.1108/TR-04-2023-620

Caporale, G. M., Gil-Alana, L. A., & Imeri, A. (2023). Tourism persistence in the Southeastern European countries: The impact of COVID-19. *Cogent Economics & Finance*, 11(1), 2280349. https://doi.org/10.1080/23322039.2023.2280349

Carida, A., Colurcio, M., Edvardsson, B., & Pastore, A. (2022). Creating harmony through a plethora of interests, resources and actors: the challenging task of orchestrating the service ecosystem. *Journal of Service Theory and Practice*, 32(4), 477-504. https://doi.org/10.1108/JSTP-06-2021-0110

Cela, S., Hysa, X., Duman, T., & Zenelaj, B. (2022). Regional branding of Western Balkans through sustainable tourism. *Enlightening Tourism. A Pathmaking Journal*, 12(2), 521–564. https://doi.org/10.33776/et.v12i2.7079

Chernev, A. (2019). *Strategic Marketing Management - The Framework*, 10th Edition. Cerebellum Press.

Çinaj, N., Zotaj, E., & Dhimitri, J. (2022). Applicability of anti-COVID-19 measures and their impact upon the perceptions on the safety and image of the structure of tourism: Case study; Albania. *GeoJournal of Tourism and Geosites*, 44(4), 1369–1378. https://doi.org/10.30892/gtg.44423-955

Duda, T. (2024). Cross-Border Heritage Routes and Areas: An Important Element of Regional Sustainable Tourism. In: Trono, A., Castronuovo, V., Kosmas, P. (eds) *Managing Natural and Cultural Heritage for a Durable Tourism*. Springer, Cham. https://doi.org/10.1007/978-3-031-52041-9_15

Dwyer, L. (2020). Tourism development and sustainable well-being: a Beyond GDP perspective. *Journal of Sustainable Tourism*, 31(10), 2399–2416. https://doi.org/10.1080/09669582.2020.1825457

Dzankic, J. (2023). *EU Ideas | Why better research on the Western Balkans is worth it*. Euideas.eui.eu. https://euideas.eui.eu/2023/04/17/why-better-research-on-the-western-balkans-is-worth-it/

Environment, U. (2024). *A global foresight report on planetary health and human wellbeing*. UNEP - UN Environment Program. https://www.unep.org/resources/global-foresight-report

Federal Office for Spatial Development. (1987). 1987: *Brundtland Report.* Www.are.admin.ch. https://www.are.admin.ch/are/en/home/media/publications/sustainable-development/brundtland-report.html

Euronews (2025). *Albania presents tourism growth and development plans at ITB Berlin*. Euronews. https://www.euronews.com/business/2025/03/07/albania-presents-tourism-growth-and-development-plans-at-itb-berlin

Halili, E. (2022). *Albania Penulminate in Europe for Health Care Service*. Albania Daily News. https://albaniandailynews.com/news/albania-penulminate-in-europe-for-health-care-service

Hall, C. M., & Page, S. J. (2006). *The Geography of Tourism and Recreation*. Routledge.

IBISWorld. (2024). *IBISWorld - Industry Market research, reports, and Statistics*. Www.ibisworld.com. https://www.ibisworld.com/global/industry-trends/biggest-industries-by-revenue/

INSTAT. (2023). *Instituti i Statistikave*. Republika E Shqiperise, Instituti I Statistikave. https://www.instat.gov.al/

Kadiu, A. (2021). Building up tourism resilience after Covid-19. The case of Albania. *Journal of International Scientific Publications,* 15, 392-400., https://www.scientific-publications.net/en/article/1002260/

Kadiu, A. (2024). *Marketing Strategies Promoting Sustainable Tourism Development in the country of Albania* (p. 106) [Doctoral Thesis]. http://doktori.uni-sopron.hu/id/eprint/912/

Kadiu, A., Demi, A., & Szabo, Z. (2022). A balanced development of economic processes, environment protection and human wellbeing. *Journal of International Scientific Publications*. 16, 406-418. https://www.scientific-publications.net/en/article/1002448/

Kennell, J., Chaperon, S., Segota, T., & Morrison, A. (2021). *Western Balkans Tourism Policy Assessment and Recommendations.* Regional Cooperation Council.

Knežević, M., Pindžo, R., Ćulić, M., Kovačić, S., Dunjić, M., & Vujko, A. (2024). Sustainable (re)development of tourism destinations as a pledge for the future – A case study from the Western Balkans. *Geojournal of Tourism and Geosites*, 56(4), 1564–1575. https://doi.org/10.30892/gtg.56413-1327

Kontic, L., & Maksimovic, S. (2023). The relationship between tourism, renewable energy and economic growth in Western Balkan countries. In *7th International Thematic Monograph: Modern Management Tools and Economy of Tourism Sector in Present Era*, 63–75., https://doi.org/10.31410/tmt.2022-2023.63

Kotler, P., Keller, K. L., & Chernev, A. (2021a). Marketing Management (16th ed.). Pearson Education.

Malatyinszki, Sz., Kálmán, B.G., & Dávid, L.D. (2025). The role of geoparks in sustainable tourism development: A case study approach. *Geojournal of Tourism and Geosites*, 59(2), 572–586. https://doi.org/10.30892/gtg.59206-1438

Mayring, P. (2015a). Qualitative Inhaltsanalyse : Grundlagen und Techniken (12th ed.). Weinheim, Bergstr Beltz, J.

Ministry of Tourism. (2023). *Data about tourism development in Albania* [Personal communication].

Murphy, P., & Price, G. (2005). *Global Tourism.* Butterworth-Heinemann. Editors: William F. Theobald

Neuman, W. L. (2013). *Social Research Methods: Qualitative and Quantitative Approaches: Pearson New International Edition*. Harlow Pearson Education Limited.

OECD. (2021). Multi-dimensional Review of the Western Balkans. OECD. https://www.oecd.org/en/publications/multi-dimensional-review-of-the-western-balkans_4d5cbc2a-en.html

Paiva, T., Felgueira, T., Alves, C., & Costa, A. (2025). Strategies for Building Accessible and Inclusive Rural Tourism Ecosystems in Cross-Border Regions: The Case of Rural and Border Territory. *Tourism and Hospitality*, 6(1), 23. https://doi.org/10.3390/tourhosp6010023

Porfido, E. (2020). *Annual Review of Territorial Governance in the Western Balkans.* 2020, 24–45. https://doi.org/10.32034/CP-TGWBAR-I02-03

Puci, J., Demi, A., & Kadiu, A. (2023). Impact of macroeconomic variables on the construction sector. *Corporate and Business Strategy Review*, 4(1), 22–30. https://doi.org/10.22495/cbsrv4i1art2

Remenyik, B., Szőke, B., Veres, B., & Dávid, L. D. (2025). Innovative sustainability practices in ecotourism and the hotel industry: Insights into circular economy and community integration. *Journal of Infrastructure, Policy and Development,* 9(1):10946. https://doi.org/10.24294/jipd10946

Ritschl, V., Weigl, R., & Stamm, T. (2016). *Wissenschaftliches Arbeiten und Schreiben*. Springer-Verlag.

RTSH (2025a): *Tourism in Albania: Deputy Minister Gjuzi outlines priorities and challenges for 2025*. Radio Televizioni Shqiptar. https://rti.rtsh.al/article/tourism-in-albania-deputy-minister-gjuzi-outlines-priorities-and-challenges-for-2025

RTSH (2025b). *Trans Dinarica: A key attraction for Albania at ITB Berlin 2025*. Radio Televizioni Shqiptar. https://rti.rtsh.al/article/trans-dinarica-a-key-attraction-for-albania-at-itb-berlin-2025

Savitz, A. W., & Weber, K. (2013a). *Talent, transformation, and the triple bottom line: how companies can leverage human resources to achieve sustainable growth*, 63–65, Jossey-Bass.

Savitz, A. W., & Weber, K. (2013b). *The triple bottom line: how today's best-run companies are achieving economic, social, and environmental success--and how you can too* (61). Jossey-Bass.
Sharpley, R. (2019). *Tourism development and the environment: beyond sustainability*? Earthscan.
Sharpley, R. (2020). Tourism, sustainable development and the theoretical divide: 20 years on. *Journal of Sustainable Tourism*, 28(11), 1932–1946. https://doi.org/10.1080/09669582.2020.1779732
Singh, P., Sharma, D., & Abdullah, H. (2024). Sustainable Tourism Practices: Evidence From Global Perspectives to Achieve Development Through Economic and Environmental Balance. Sharma, D., Abdullah, H. & Singh, P. (Ed.) *Sustainable Tourism*, Part A, Emerald Publishing Limited, Leeds, pp. 169-182. https://doi.org/10.1108/978-1-83797-979-020241010
Stewart, D. W., & Kamins, M. A. (1993). *Secondary Research 4: Information Sources and Methods*. SAGE Publications Inc.
Sziva, I., Balázs, O., Michalkó, G., Kiss, K., Puczkó, L., Smith, M., & Apró, É. (2017). Branding strategy of the countries in the Balkan region – Focusing on health tourism. *GeoJournal of Tourism and Geosites,* 19(1):61-69, https://gtg.webhost.uoradea.ro/PDF/GTG-1-2017/220_Michalko.pdf
The Balkan Forum. (2024). Research on tourism in the Western Balkans. The Balkan Forum. https://2018.thebalkanforum.org/en/research-on-tourism-in-the-western-balkans
The Guardian, & Neslen, A. (2017). Balkan hydropower projects soar by 300% putting wildlife at risk, research shows. Inkl. https://www.inkl.com/news/balkan-hydropower-projects-soar-by-300-putting-wildlife-at-risk-research-shows
UN Tourism. (2024a). Investing in Albania. Www.unwto.org. https://www.unwto.org/investment/tourism-doing-business-investing-in-albania
UN Tourism. (2024b). International Tourist Arrivals hit 96% of pre-pandemic levels through July 2024. Unwto.org. https://www.unwto.org/news/international-tourist-arrivals-hit-96-of-pre-pandemic-levels-through-july-2024
UN Tourism (2025). World Tourism Barometer. 23(1), United Nations World Tourism Organization. https://www.unwto.org/un-tourism-world-tourism-barometer-data
UN Tourism Barometer (2024). UN Tourism World Tourism Barometer | Global Tourism Statistics. Www.unwto.org. https://www.unwto.org/un-tourism-world-tourism-barometer-data
UNWTO. (2020). UNWTO World Tourism Barometer and Statistical Annex. January 2020. UNWTO World Tourism Barometer, 18(1), 1–48. https://doi.org/10.18111/wtobarometereng.2020.18.1.1
UNWTO. (2024a). *Glossary of Tourism Terms*. Www.unwto.org; United Nations World Tourism Organization. https://www.unwto.org/glossary-tourism-terms
UNWTO. (2024b). *Sustainable development*. Unwto.org; UNWTO. https://www.unwto.org/sustainable-development
Uvalić, M. (Ed.). (2023). *Integrating the Western Balkans into the EU*. Springer Nature.
Visegrad Insight (2022*). About the Project*. Visegrad Insight. https://visegradinsight.eu/western_balkans_scenarios/about-the-project/
Wall, G., & Mathieson, A. (2006). *Tourism: changes, impacts, and opportunities*. Harlow: Pearson Prentice Hall.
Wani, M. J. G., Loganathan, N., & Mujalli, A. (2024). The impact of sustainable development goals (SDGs) on tourism growth. Empirical evidence from G-7 countries. *Cogent Social Sciences*, 10(1). https://doi.org/10.1080/23311886.2024.2397535
Weaver, D. (2005). *Sustainable Tourism*. Routledge. https://doi.org/10.4324/9780080474526
Williams, S. (2009). *Tourism Geography*. Routledge.
Williams, S., & Lew, A. A. (2014). *Tourism Geography*. Routledge.
World Bank. (2022). Amid Ongoing Shocks, Albania Needs Policies and Reforms that Boost Growth. World Bank. https://www.worldbank.org/en/news/press-release/2022/10/24/amid-ongoing-shocks-albania-needs-policies-and-reforms-that-boost-growth
World Trade Organization. (2024). WTO | Albania - Member information. https://www.wto.org/english/thewto_e/countries_e/albania_e.htm
WTTC (2024). Albania's Travel & Tourism Sector Soar to Record Heights, WTTC Reports - Travel and Tour World. Travel and Tour World. https://www.travelandtourworld.com/news/article/albanias-travel-tourism-sector-soar-to-record-heights-wttc-reports/
WTTC (2025). Travel & Tourism Economic Impact Research (EIR). World Travel & Tourism Council

Article history: Received: 14.02.2025 Revised: 23.05.2025 Accepted: 17.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1279-1289
DOI 10.30892/gtg.602spl24-1500

THE IMPACT OF NOVELTY- SEEKING AND PERCEIVED COOLNESS ON TOURIST BEHAVIORAL INTENTION: THE MEDIATING ROLE OF CREATIVE TOURISM EXPERIENCE

Quoc Tuan HUYNH [1*]

[1] Dong Thap University, Faculty of Economics and Law, Dong Thap, Vietnam; hqtuan@dthu.edu.vn (Q.T.H.)

Citation: Huynh, Q.T. (2025). The impact of novelty- Seeking and perceived coolness on tourist behavioral intention: The mediating role of creative tourism experience. *Geojournal of Tourism and Geosites*, 60(2spl), 1279–1289. https://doi.org/10.30892/gtg.602spl24-1500

Abstract: Research on tourist behavioral intention is a very important part of the tourism industry, especially for tourism professionals, travel agencies, tourism management agencies, as well as destinations. Specifically, research on tourist behavioral intention is the basis for predicting demand, understanding tourists' psychology and behavior, and providing an important source of information in supporting the development of marketing strategies for tourist destinations. Therefore, tourist behavioral intention is an important variable that destination managers are always interested in in attracting tourists and developing local tourism. This study aims to examine the impact of factors on tourist behavioral intention. In particular, the focus is on studying the impact of novelty-seeking and perceived coolness on travel behavior intention because these are factors that most tourists are interested in in today's tourism context, especially when the similarity of tourism products of tourist destinations is increasing. To conduct the study, the author conducted direct interviews with 356 tourists to some provinces of the Mekong Delta, Vietnam (Dong Thap, Can Tho, An Giang and Kien Giang) using a convenient sampling method. In addition, the structural equation model analysis method based on the partial least squares method (PLS-SEM) was used to evaluate the measurement model and test the structural model with the support of the SmartPLS 3.2 software tool. The research results show that: First, both novelty-seeking and perceived coolness have a direct impact on creative tourism experience, which means that when tourists perceive a tourist destination as more novel and cool than other tourist destinations, it will promote tourists' desire to experience creative tourism at that destination. Second, creative tourism experience has a direct impact on tourism behavioral intention, this result explains that when tourists have a desire to experience creative tourism at a tourist destination, it will promote tourists' tourism behavioral intention. In addition, the research results also show that novelty-seeking and perceived coolness have an indirect impact on tourism behavioral intention through creative tourism experience.

Keywords: creative tourism experience, Mekong delta, novelty-seeking, tourist behavioral intention, perceived coolness

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INTRODUCTION

The tourism industry has recently undergone changes in consumer preferences and behaviors (Pung et al., 2020), driven by economic development and fragmented consumer needs in the postmodern era (Richards, 2011). In the past, most tourists focused on tangible cultural resources, such as visiting famous landmarks and participating in excursions. However, modern tourists increasingly seek immersive experiences that emphasize local culture, adventure activities, thrilling experiences, and unique destinations (Fraiz et al., 2020). The tourism industry has adapted to changing expectations by offering diverse experiences that meet the growing demand for authentic travel. Modern tourists are increasingly interested in engaging with indigenous cultures, community traditions, and local customs, as well as observing and participating in everyday activities that are different from their own (Jebbouri et al., 2021; Ramos-García et al., 2023). This shift reflects a shift from conventional exploration to a focus on destination value, where tourists actively seek personal growth, environmental exploration, and social interaction (Xue et al., 2022). This development has given rise to the concept of creative tourism, a reimagining of traditional cultural tourism (Ababneh & Masadeh, 2019). Creative tourism is therefore seen as an extension of cultural tourism, offering a more immersive and experiential approach.

Creative tourism is defined as authentic experiences involving art, cultural heritage or unique local elements, allowing tourists to actively participate in local communities and cultures (Baixinho et al., 2020). This concept not only enhances the tourist experience but also boosts the economy and increases the attractiveness of destinations. The increasing availability of creative tourism services in many countries plays an important role in shaping the destination preferences of both domestic and international tourists. Tourists participate in a variety of creative tourism experiences (CTE), such as cooking classes, craft workshops and art or cultural tours. These experiences have been shown to have a strong influence on tourists' preferences when visiting specific destinations (Qian et al., 2022; Rasoolimanesh et al., 2022; Tran, 2022). Therefore, tourism managers are encouraged to provide CTE to stimulate behavioral intentions, such as revisiting and recommending to others (Ali et al., 2016; Dean & Suhartanto, 2019).

[*] Corresponding author

A recent study by Li & Kovacs (2024) on creative tourism & tourist motivations in three creative cities in China found that diverse travel experiences, educational intentions, & relationship enhancement were key drivers of repeat visits. In addition, the study identified new locations, creative atmospheres, & unique experiences as important drivers of destination choice. The findings indicated that creative tourists visited these destinations for self-development, to explore new trends, to enhance their creative potential, & to be motivated to learn. The opportunity to appreciate, participate, & interact in creative tourism experiences (CTE) was central to educational intentions influencing destination choice. Furthermore, the ability to engage in co-creation activities with family & friends fosters stronger relationships, encouraging additional tourist visits (Li & Kovacs, 2024). Research by Zhang et al. (2025), this study highlights the importance of a brand's perceived coolness in enhancing its appeal and driving its success.

Using the Model of Goal-Directed Behavior (MGB) as a framework, the research examines how Airbnb's perceived coolness influences consumers' behavioral intentions toward the platform. The hypotheses were tested through partial least squares structural equation modeling (PLS-SEM) with data collected from 557 U.S. travelers who had stayed in an Airbnb within the past six months. Additionally, fuzzy-set qualitative comparative analysis (fsQCA) was employed to identify the causal configurations behind consumers' desires and behavioral intentions toward Airbnb. The PLS-SEM results underscored the significant impact of perceived coolness on shaping consumers' desires and behavioral intentions. Meanwhile, the fsQCA findings revealed different causal pathways influencing behavioral intentions across generational groups, with anticipated emotions playing a consistent role across all configurations. By integrating perceived coolness into the MGB framework within the context of Airbnb, this study adds to the existing body of literature.

It also provides valuable insights by uncovering causal configurations using fsQCA. For Airbnb providers, the findings emphasize the importance of developing and enhancing the four dimensions of perceived coolness. Moreover, segmenting the consumer market by generation is recommended to tailor strategies effectively. Lastly, the critical influence of anticipated emotions should not be overlooked in shaping consumer behavior. Like any research, this study has several limitations. While we carefully controlled the sample selection and derived meaningful insights using PLS-SEM and fsQCA, we did not consider participant demographics such as gender, occupation, education level, or income.

Additionally, the sample consisted of well-educated individuals, which could have influenced the findings. Furthermore, the study focused exclusively on Airbnb users in the United States, limiting the generalizability of the results. Future research could compare Airbnb listings across different regions, cultures, and economies to validate our findings and draw more robust conclusions, this study explores how perceived "destination coolness" impacts Generation Z tourists, drawing on self-identity theory and the belief–desire–intention model.

A total of 600 questionnaires were distributed to Generation Z tourists, yielding 539 valid responses. Data analysis was performed using SPSS 23 and SmartPLS 4.0. The results reveal that destination coolness significantly enhances Generation Z tourists' sense of novelty, destination-self connection, self-identity, and destination advocacy. This research provides a theoretical framework for understanding perceived destination coolness and contributes to empirical studies on its underlying mechanisms. It highlights the emotional and identity-driven connections between destinations and tourists, illustrating how self-identity plays a key role in motivating destination advocacy behaviors. Based on these findings, the study offers practical recommendations for destination marketing and development, emphasizing strategies that cater to tourists, destination managers, and other stakeholders. This study has several limitations that should be acknowledged.

First, all participants were members of Generation Z in China, meaning the findings are specific to this geographic and sociocultural context, which may limit their applicability to other regions or cultures. Second, data were collected through an online platform using a self-report questionnaire, which could introduce potential biases in the sample. Future research should consider employing more objective measurement methods. For instance, longitudinal studies could be conducted to explore the long-term development of destination coolness. Additionally, experimental methods might be used to investigate how different types of destinations—such as urban, rural, or natural—elicit varying perceptions of coolness.

These approaches could provide a deeper and more comprehensive understanding of the concept. Research by Pratminingsih et al. (2025) examining the influence of novelty-seeking, perceived coolness and servicescape on hedonic well-being and behavioral intention of tourists in creative tourism context. The results revealed that novelty-seeking, perceived coolness, and servicescape significantly enhanced CTE, which, in turn, positively influenced both hedonic well-being and behavioral intention. Additionally, gender was found to moderate the relationship between novelty-seeking and CTE. These findings provide a deeper understanding of the role of CTE in shaping well-being and behavioral intention, offering valuable theoretical insights into the field of creative tourism. Practical strategies were also proposed for destination managers to enhance tourists' experiences, encouraging repeat visits and promoting positive word-of-mouth for creative tourism destinations. However, the limitations of this research include the following: The exploration was conducted in only three major cities, which restricts the geographical scope of the findings. Future studies could expand the coverage to include broader and more diverse locations. The study primarily focused on creative tourism. This indicates the need for future research to explore other tourism types, such as dark tourism, smart tourism, or selfie tourism.

Only three factors were considered as antecedents of CTE. Future investigations should examine additional factors, such as tourist engagement and the adoption of VR technology. While the moderating role of gender was evaluated, other characteristics, such as differences between domestic and foreign tourists, should also be considered in future research. The role of hedonic well-being in shaping behavioral intention was addressed. However, there is a need to further examine the relationship between hedonic and eudaimonic well-being in the context of CTE.

Although creative tourism has received considerable attention in the literature, the analysis of CTE and their impact on tourist behavior remains unexplored. Previous studies have examined factors influencing behavioral intentions, such as destination image, personality, motivation, trust, price promotion, and involvement (Chiu et al., 2016; Hultman et al., 2015; Suhartanto et al., 2020). In addition, a few recent studies have also addressed factors influencing behavioral intentions, such as: Tourism Motivation, Perceived Value (Zhao et al., 2024); perceived landscape value (Du & Wang, 2023); Experience Quality and Destination Image (Dakhi, 2025). However, the specific determinants of tourists' experiences in creative tourism and their influence on behavioral intentions still need further investigation (Wei et al., 2019).

Findings regarding the factors influencing tourists’ behavioral intentions are inconsistent. Some studies have identified a potential positive effect of novelty seeking on behavioral intentions (Albaity & Melhem, 2017; Huyen & Nghi, 2019), while others have observed a negative effect (Assaker et al., 2011), & some have found no significant relationship at all (Coudounaris & Sthapit, 2017). Additionally, novelty seeking and servicescape have been found to be partially related to behavioral intentions (Chang et al., 2018; Xu & Gursoy, 2020). However, the mediating factors for this relationship in the context of creative tourism remain unclear. These inconsistencies highlight a research gap, emphasizing the need for further studies to clarify the relationships between these variables. Based on a review of previous studies, the author found research gaps when examining the impact of factors influencing behavioral intention. In particular, the importance of novelty-seeking and perceived coolness for tourist destinations. From there, it activates the need for creative tourism experiences and promotes behavioral intentions. Therefore, in order to have information to support stakeholders (especially for tourism professionals, travel agencies, tourism management agencies, as well as destinations) in building strategies to attract tourists to tourist destinations, it is appropriate and meaningful to conduct research on the impact of novelty-seeking and perceived coolness on tourist behavioral intention: the mediating role of creative tourism experience.

THEORETICAL FRAMEWORK

Stimulus–organism–response theory

The theoretical foundation of this inquiry is predicated upon the stimulus–organism–response (S–O–R) paradigm as articulated by Mehrabian & Russell (1974). The S–O–R framework, fundamentally anchored in the discipline of environmental psychology, evolved from the stimulus–response (S–R) theory prevalent in behaviorism by integrating the mediating function of the organism or the individual’s internal conditions that exist between stimulus and response. The S–O–R theory has been employed to investigate the interplay among input (stimulus), process (organism), and output (response) (Kim et al., 2020; Yu et al., 2021). This elucidates that the existence of specific stimuli (S) influences the emotional state of an individual (O), thereby precipitating a range of consumer behavioral responses (R).

The S–O–R theory functions as a conceptual framework extensively utilized within the realms of tourism and consumer behavior studies to comprehend the interrelationships among external stimuli, internal cognitive processes, and the resultant behavioral responses. In accordance with Chang et al. (2014), the S–O–R model represents the most appropriate framework for comprehending tourist behavior, particularly in light of the intangible and experiential characteristics of tourism. The model underscores the emotions elicited by the environment and the corresponding mental responses, which are significantly aligned with the examination of tourist experiences.

The S–O–R model context elucidates the manner in which distinctive elements, such as the pursuit of novelty and the perception of coolness, exert influence over the internal states of tourists and subsequently guide their behaviors. This comprehension is of paramount importance in the domain of creative tourism, wherein the stimulation of unique perceptions and emotions is imperative for satisfying the aspirations for unforgettable and innovative experiences. The designation “stimuli” pertains to external variables that impact the internal state of an individual and facilitate engagement (Chen et al., 2022). Stimuli can encompass environmental, social, or psychological factors that shape the way in which an individual perceives or conducts themselves within a specific context (Nian et al., 2023). This interaction can engender cognitive and affective conditions that significantly influence decision-making processes and behavioral inclinations (Asyraff et al., 2023). Within the framework of creative tourism research, stimuli are articulated through constructs such as novelty-seeking and perceived coolness. Novelty-seeking embodies the pursuit of unique, diverse, and stimulating experiences that diverge from habitual routines, thereby promoting engagement in unconventional activities (Aydin et al., 2022). Traditionally characterized as the quest for new experiences (Tsai, 2016), novelty-seeking in this context pertains to the search for culturally rich, innovative, and diverse activities that deviate from the norm. Moreover, it constitutes a construct evaluated through the measurement of tourists' curiosity, exploration, and engagement in non-routine activities.

The second stimulus, Perceived Coolness, refers to the appealing qualities of a trendy and culturally relevant destination (Chen & Chou, 2019; Munawar et al., 2021). In the context of creative tourism, perceived coolness includes attributes such as originality, subcultural appeal, and trendiness, which align with the desire for culturally engaging and "cool" environments. This enhances emotional engagement by fostering excitement and a sense of belonging and is measured through perceptions of uniqueness, cultural value, and alignment with current trends (Loureiro & Blanco, 2023).

The "organism" component of the S–O–R theory acts as an intermediary element, representing the internal processes and states that mediate between external stimuli and subsequent behavioral responses (Mehrabian & Russell, 1974). It encompasses the emotional and cognitive states of individuals. Numerous empirical studies in the hospitality and tourism sectors have utilized factors such as emotions (Xiong et al., 2022), memories (Fan et al., 2023), and experiences (Sthapit et al., 2024) to represent the organism in understanding consumer responses. In this study, Creative Tourism Experience (CTE) is used to represent the internal state of the organism, capturing how tourists process and respond to the environment both cognitively and emotionally. The "response" component refers to the reaction of the organism to stimuli (Mehrabian & Russell, 1974), which includes behaviors characterized by approach or avoidance. These responses result from the decision-making process when individuals encounter new stimuli. In tourism research, responses are often measured using constructs such as revisit intention (Rodrigues et al., 2023) and destination loyalty (Zhang et al., 2018). On the other hand, behavioral intention reflects tourists' desire to revisit and recommend a destination, serving as an indicator of loyalty driven by satisfaction and engagement (Peng et al., 2022; Zhang et al., 2018).

HYPOTHESIS DEVELOPMENT

The relationship between Novelty-seeking and CTE

Novelty-seeking is a widely recognized and fundamental construct associated with an array of positive affective states, including pleasure and enjoyment, thereby elucidating the manner in which cognitive and behavioral psychological frameworks can enhance the comprehension of tourism phenomena (Skavronskaya et al., 2020). Empirical investigations indicate that novelty-seeking within the tourism context is correlated with an inclination to pursue distinctive and memorable experiences that diverge from quotidian surroundings (Blomstervik et al., 2021). Novelty is conceptualized as an outcome stemming from exploration, relaxation, enjoyment, and a deviation from established routines. The recognition of novelty as a pivotal determinant of tourist attraction elucidates that the drive for unique experiences substantially shapes the exhibited behaviors. Novelty-seeking behavior, which exhibits a stable and enduring nature over time, signifies a proclivity for new experiences, frequently characterized by a sense of enthusiasm. Individuals exhibiting a propensity for novelty generally manifest traits such as independence, emotional receptivity, nonconformity, adventurousness, and a predilection for proactive engagement rather than dependence on others to optimize opportunities for self-fulfillment (López Bonilla et al., 2011). With respect to novelty-seeking in Culinary Tourism Experiences (CTE), Tsai (2016) posited that the allure of food consumption experiences for tourists is influenced by factors beyond mere gastronomic offerings. Additional elements, notably the pursuit of novelty, play a critical role in shaping these experiences. The drive for novelty serves as a catalyst for tourists and significantly impacts the perceived value of their experiences, thereby illuminating the functions it fulfills within the tourism paradigm. Chandralal et al. (2015), in their examination of travel blogs, established a robust correlation between novelty and tourism experiences. Tourists are predisposed to retain memories of unique and distinctive encounters to a greater extent than those associated with conventional tourist activities. CTE often encompasses an aspect of unpredictability, and individuals who are novelty seekers, comfortable with uncertainty, exhibit enhanced adaptability and resilience in the circumstances they face. Such individuals may derive substantial satisfaction from creative tourism initiatives, driven by a perception rooted in adventure and enthusiasm, which fosters increased engagement and the creation of memorable experiences (Wurzburger et al., 2009); consequently, the ensuing hypothesis is formulated:

H_1: Novelty-seeking has a significant effect on CTE.

The relationship between Perceived coolness and CTE

Perceived Coolness may be delineated into intrinsic and extrinsic categories, with the intrinsic coolness of an individual pertaining to their character and personality traits. Conversely, extrinsic coolness encompasses stylistic selections, including apparel, accessories, linguistic expression, posture, or overall appearance (Nuerbiya, 2015). Given the intimate interrelation between these categories, this study undertakes an examination of perceived coolness in its entirety, rather than executing discrete evaluations. The notion of 'coolness' pertains to the degree to which a product is regarded as fashionable, appealing, and captivating. Terminology associated with coolness elicits affirmative emotions such as pleasure and exhilaration, frequently linked to concepts of innovation and style (Im et al., 2015).

The concept of perceived coolness in the realm of creative tourism encapsulates the experiential attributes or the contemporary appeal, distinctiveness, and cultural significance of a particular destination (Munawar et al., 2021). Such characteristics augment the allure of a destination for individuals in pursuit of thrilling and modern experiences; consequently, creative tourism experiences regarded as cool by tourists are likely to result in enhanced overall experiences (Jamshidi et al., 2023). The perception of coolness frequently provokes emotional investment, invoking feelings of excitement and inspiration, along with amplifying enjoyment (Loureiro & Blanco, 2023). This aligns with individual preferences and values, resonating with a multifaceted array of tourists who possess common interests and facilitating the evolution of creative tourism experiences into more inclusive and pleasurable ventures (Scheyvens & Biddulph, 2020). Thus, the subsequent hypothesis is formulated:

H_2: Perceived coolness has a significant effect on CTE

The relationship between CTE and behavioral intention

Zhang et al. (2018) ascertained that tourism experiences significantly influenced behavioral intentions, thereby affecting the decision-making processes over time. Consequently, stimulating destinations are likely to draw a greater number of tourists and encourage repeat visits (Ali et al., 2016; Chang & Backman, 2016). Repeat tourists are typically regarded as the most desirable market segment for numerous destinations due to their propensity for extended stays, elevated satisfaction levels stemming from realistic expectations, and their tendency to disseminate positive word-of-mouth endorsements (Chi, 2012). These individuals exhibit heightened engagement in a variety of activities, which can be attained with diminished advertising expenditures compared to regular or first-time tourists (Zhang et al., 2018). Huang & Hsu (2009) underscored that experiences consistently exerted a positive influence on the attitudes towards a destination and the intention to revisit. Tourists who have previously engaged with a destination may articulate a sense of assurance regarding their return. According to Petrick et al. (2001), experiences exerted a substantial impact on revisit intentions, indicating that individuals were inclined to return to enjoyable activities. Therefore, the subsequent hypothesis was formulated:

H_3: CTE has a significant influence on tourist behavioral intention.

Based on the literature review and the hypotheses set, the research model (Figure 1) depicting the influence of Novelty-seeking and perceived coolness on the creative tourism experience and behavioral intention is established as follows:

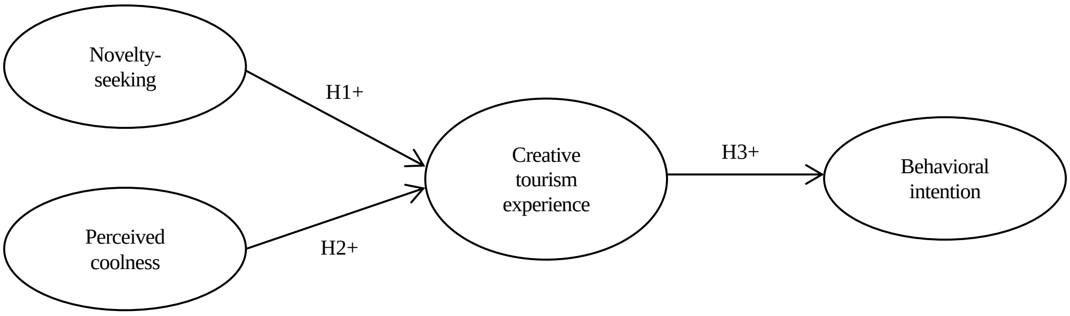

Figure 1. Proposed research model

RESEARCH METHODOLOGY

Measurement scale

All measurement items were adapted from previous studies to ensure the validity of the scale. The content of the scale was slightly modified to align with the research context. Each measurement item was evaluated using a 5-point Likert scale. Refer to Table 1 for a detailed overview of all scales used in this study.

Table 1. Interpretation of observed variables in the research model

Construct	Code	Observed variables	Source
Novelty-seeking	NOS1	This creative tourism spot is novel compared to other attraction centers	Cheng et al. (2015), Chen & Yoon (2017), Mun et al. (2018)
	NOS2	This creative tourism spot has unique features not offered in other tourism attractions	
	NOS3	In my opinion, this creative tourism attraction is extraordinary	
Perceived coolness	PEC1	When I first heard about this attraction, I thought visiting would be cool	Kock (2021), Chen & Chou (2019), Bruun et al. (2016)
	PEC2	This attraction will make me look stylish and on-trend	
	PEC3	When I think of hip and happening locations, this attraction immediately comes to mind	
	PEC4	This creative tourism has some unique features This creative tourism is stylish and forward-thinking	
Creative tourism experience	CTE1	Creative tour left a lasting impression on me	Wang et al. (2020), Dean & Suhartanto (2019), Hung et al. (2016)
	CTE2	Creative tour offered new experiences	
	CTE3	Creative tour gave me experiences different from any other location	
Behavioral intention	BEI1	I would like to return to this creative tour in the future	Liu et al. (2017), Ali et al. (2016), Çelik & Dedeoğlu (2019)
	BEI2	I would recommend this creative tour to my family and acquaintances	
	BEI3	I recommend this creative tour to other individuals for a visit	
	BEI4	I want to tell other individuals positive things about this creative tour	

Data collection

The survey was conducted from October 2024 to December 2024. Due to the difficulty in accessing the survey subjects, the study used the convenience sampling method. The direct interview method was used to collect information from respondents. The survey subjects were tourists visiting some famous tourist destinations in the Mekong Delta.

The total number of surveys was 400, the total number of survey responses received was 378, of which the number of responses that met the requirements and ensured reliability was 356, specifically: Dong Thap (115 tourists), Can Tho (85 tourists), An Giang (80 tourists), Kien Giang (76 tourists). Table 2 indicates 54.78% were males, 45.22% were females, and 4.21% were under 20; 28.37% were from 20 to under 30; 35.67% were from 30 to under 40; 25.00% were from 40 to under 50, and 6.74% were older than 50, and 3.37% were no income; 18.82% were under 3 mil; 32.30% were from 3 to under 6 mil; 35.11% were from 6 to under 9 mil and 10.39% were above 9 mil.

Table 2. The demographic survey data

Demographic profile		Frequency (n = 356)	Percent (%)
Gender	Male	195	54.78
	Female	161	45.22
Age	Under 20	15	4.21
	From 20 to under 30	101	28.37
	From 30 to under 40	127	35.67
	From 40 to under 50	89	25.00
	Above 50	24	6.74
Income	No income	12	3.37
	Under 3 mil	67	18.82
	From 3 to under 6 mil	115	32.30
	From 6 to under 9 mil	125	35.11
	Above 9 mil	37	10.39

RESEARCH RESULTS AND DISCUSSION

In the initial stage, the measurement model was assessed and analyzed to confirm its quality before advancing to the second stage, which involved evaluating the structural model.

Measuring model

Table 3 demonstrates that all measurement items achieved convergent validity. The table includes Cronbach's Alpha values, average variance extracted (AVE) statistics for each dimension, and factor loadings for each item. With only rare exceptions, the results indicate that the outer loadings of the items were approximately 0.708 or higher, supporting the proposed factor structure (Hair et al., 2021). The AVE values range from 0.680 to 0.762, surpassing the recommended threshold of 0.50 (Hair et al., 2010). Additionally, the composite reliability (CR) and Cronbach's Alpha values, which ranged from 0.882 to 0.921, confirm construct reliability, exceeding the significance threshold of 0.7.

In this study, the heterotrait–monotrait (HTMT) criterion was applied to assess discriminant validity (Henseler et al., 2015). Discriminant validity is established when the square root of the AVE for each construct exceeds its correlations with other constructs. The results presented in Table 4 indicate that the square root of the AVE is higher than the correlations between all pairs of dimensions, confirming discriminant validity.

Table 3. Construct reliability and validity

Construct	Code	CA	CR	AVE	OL
Novelty-seeking	NOS1	0.843	0.906	0.762	0.845
	NOS2				0.904
	NOS3				0.869
Perceived coolness	PEC1	0.843	0.894	0.680	0.841
	PEC2				0.820
	PEC3				0.749
	PEC4				0.882
Creative tourism experience	CTE1	0.799	0.882	0.713	0.857
	CTE2				0.813
	CTE3				0.863
Behavioral intention	BEI1	0.885	0.921	0.745	0.807
	BEI2				0.882
	BEI3				0.875
	BEI4				0.885

Notes: CA: Cronbach's Alpha; CR: Composite Reliability, AVE: Average Variance Extracted; OL: Outer Loadings; NOS: Novelty-seeking; PEC: Perceived coolness; CTE: Creative tourism experience; BEI: Behavioral intention.

Table 4. Discriminant validity

Construct	Behavioral intention	Creative tourism experience	Novelty-seeking	Perceived coolness
Behavioral intention	**0.863**			
Creative tourism experience	0.451	**0.845**		
Novelty-seeking	0.837	0.490	**0.873**	
Perceived coolness	0.338	0.310	0.266	**0.825**

Structural model

Path standardized coefficients (β values) and p-values were used to evaluate the relationships between the components. As shown in Table 5 and Figure 2, both factors novelty-seeking and perceived coolness exert a positive and statistically significant direct effect on creative tourism experience ($\beta = 0.439$, $p < 0.05$; $\beta = 0.194$, $p < 0.05$). This is evidenced by the positive estimate coefficients and t-values exceeding 1.96 at a 5% significance level, as suggested by Henseler et al. (2009). Among these factors, Novelty-seeking has the strongest influence on creative tourism experience. Additionally, these two factors collectively account for 27.5% of the variation in creative tourism experience.

Table 5. Hypothesis analysis results

Relationship	Path coefficients	P- values	Hypotheses	Decision
Direct effects				
NOS → CTE	0.439	0.000	H_1	Accepted
PEC → CTE	0.194	0.000	H_2	Accepted
CTE → BEI	0.451	0.000	H_3	Accepted
Indirect effects				
NOS → CTE → BEI	0.198	0.000	H_4	Accepted
PEC → CTE → BEI	0.087	0.001	H_5	Accepted

Notes: NOS: Novelty-seeking; PEC: Perceived coolness; CTE: Creative tourism experience; BEI: Behavioral intention.

Novelty-seeking has a positive influence on creative tourism experience, a finding that is consistent with Tsai's (2016) study, which found that the allure of food consumption experiences for tourists is influenced by factors beyond mere gastronomic offerings. Further reinforcing this relationship, Chandralal et al. (2015), in their examination of travel blogs, established a robust correlation between novelty and tourism experiences. In addition, perceived coolness positively affects creative tourism experience, a relationship also supported by previous studies (Jamshidi et al., 2023; Loureiro & Blanco, 2023; Scheyvens & Biddulph, 2020). Furthermore, creative tourism experience is confirmed as a key predictor of behavioral intention (p-value = 0.000 < 0.05), explaining 20.4% of the variance in Behavioral Intention. Using the bootstrapping method with 1,000 repetitions, the structural model was evaluated, and the results indicate that all three hypotheses were supported. This finding is consistent with previous studies. Specifically: Zhang et al. (2018) ascertained that tourism experiences significantly influenced behavioral intentions, thereby affecting the decision-making processes over time. Further strengthen this relationship, according to Petrick et al. (2001), experiences exerted a substantial impact on revisit intentions.

Mediating effects

Besides the direct influence of Novelty-seeking and Perceived coolness on Creative tourism experience, the research results (Table 5 and Figure 2) also show that: Novelty-seeking has an indirect influence on Behavioral intention through Creative tourism experience ($\beta = 0.198$, $p < 0.05$); Perceived coolness has an indirect influence on Behavioral intention through Creative tourism experience ($\beta = 0.087$, $p < 0.05$).

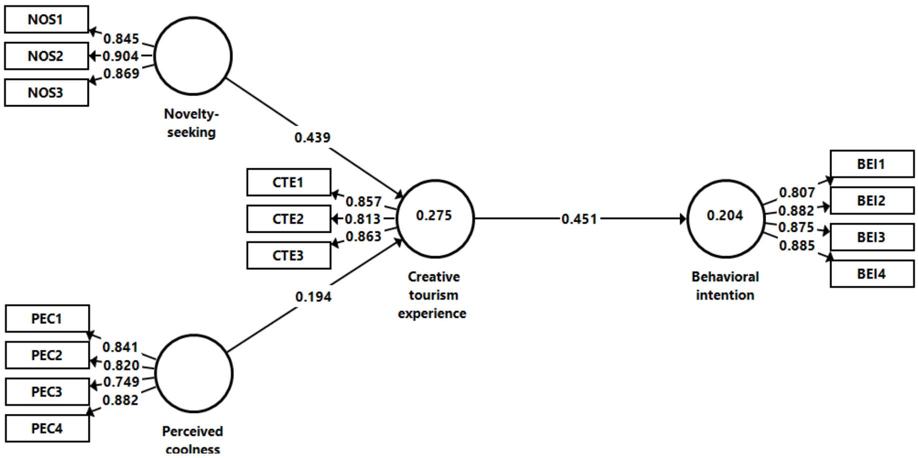

Figure 2. Structural model result

CONCLUSION AND LIMITATIONS

The study demonstrated that novelty-seeking and perceived coolness have a positive impact on creative tourism experience. In addition, creative tourism experience also has a direct impact on tourist behavioral intention.

The research results contribute to suggesting policy implications to enhance novelty-seeking and perceived coolness, thereby promoting intention to revisit tourist destinations in the Mekong Delta region, Vietnam. Although the study achieved its objectives, there are still limitations.

Firstly, this study only focused on surveying tourists to 04 provinces in the Mekong Delta region and ignored some other provinces. Therefore, further studies need to expand the scope of the survey so that the results can better represent the whole.

Secondly, the impact on tourist behavioral intention is not only due to creative tourism experience but also many other factors. However, this study could not mention all of them. Further studies need to pay attention to exploring new factors affecting creative tourism experience and tourist behavioral intention to provide adequate information for destination managers in promoting tourist behavioral intention.

Thirdly, this study has not considered the role of moderator variables (Gender, Age and Income) on the relationship between novelty-seeking and creative tourism experience, perceived coolness and creative tourism experience or the relationship between creative tourism experience and tourist behavioral intention. Therefore, further studies need to exploit this aspect.

Author Contributions: Author Contributions: Conceptualization, Q.T.H.; methodology, Q.T.H.; software, Q.T.H.; validation, Q.T.H.; formal analysis, Q.T.H.; investigation, Q.T.H.; data curation, Q.T.H.; writing - original draft preparation, Q.T.H.; writing - review and editing, Q.T.H.; visualization, Q.T.H.; supervision, Q.T.H.; project administration, Q.T.H. The author has read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgements: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Ababneh, M. A., & Masadeh, M. (2019). Creative cultural tourism as a new model for cultural tourism. *Journal of Tourism Management Research*, *6*(2), 109–118. https://doi.org/10.18488/journal.31.2019.62.109.118

Alagarsamy, S., Mehrolia, S., & Vijay, M. (2022). The importance of servicescapes in Maldivian higher education: application of the stimuli-organism-response (sOr) framework. *Journal of Facilities Management*, *20*(2), 218–234. https://doi.org/10.1108/JFM-02-2021-0027

Albaity, M., & Melhem, S. B. (2017). Novelty seeking, image, and loyalty—the mediating role of satisfaction and moderating role of length of stay: international tourists' perspective. *Tourism Management Perspectives*, *23*, 30–37. https://doi.org/10.1016/j.tmp.2017.04.001

Alexander, Z. (2012). The impact of a volunteer tourism experience, in south africa, on the tourist: the influence of age, gender, project type and length of stay. *Tourism Management Perspectives, 4*, 119–126. https://doi.org/10.1016/j. tmp.2012.07.002.

Ali, F., Ryu, K., & Hussain, K. (2016). Influence of experiences on memories, satisfaction and behavioral intentions: a study of creative tourism. *Journal of Travel & Tourism Marketing*, *33*(1), 85–100. https://doi.org/10.1080/10548408.2 015.1038418

Armbrecht, J., & Andersson, T. D. (2020). The event experience, hedonic and eudaimonic satisfaction and subjective well-being among sport event participants. *Journal of Policy Research in Tourism, Leisure and Events*, *12*(3), 457–477. https://doi.org/10.1080/19407963.2019.1695346

Asghar Ali, M., Ting, D. H., Salim, L., & Ahmad-ur-rehman, M. (2021). Influence of servicescape on behavioural intentions through mediation and moderation effects: a study on Malaysia's full-service restaurants. *Cogent Business & Management*, *8*(1), 1–26. https://doi.org/10.1080/23311975.2021.1924923

Assaker, G., Vinzi, V. E., & O'connor, P. (2011). Examining the effect of novelty seeking, satisfaction, and destination image on tourists' return pattern: a two factor, non-linear latent growth model. *Tourism Management*, *32*(4), 890– 901. https://doi.org/10.1016/j.tourman.2010.08.004

Asyraff, M. A., Hanafiah, M. H., Aminuddin, N., & Mahdzar, M. (2023). Adoption of the stimulus–organism–response (S-O-R) model in hospitality and tourism research: systematic literature review and future research directions. *Asia Pacific Journal of Innovation in Hospitality and Tourism*, *12*(1), 19–48.

Attiq, S., Abdul Hamid, A. B., Khokhar, M. N., Shah, H. J., & Shahzad, A. (2022). "Wow! it's cool": how brand coolness affects the customer psychological well-being through brand love and brand engagement. *Frontiers in Psychology*, *13*, 923870. https://doi.org/10.3389/fpsyg.2022.923870

Aydin, B., Rdoğan, B. Z., & Koç, E. (2022). The impact of novelty seeking on intention to visit a country: the mediating role of overall cuisine image. *Advances in Hospitality and Tourism Research (AHTR)*, *10*(3), 480–500. https://doi. org/10.30519/ahtr.882183

Baixinho, A., Santos, C., Couto, G., Albergaria, I. S. D., Da Silva, L. S., Medeiros, P. D., & Simas, R. M. n. (2020). Creative tourism on islands: a review of the literature. *Sustainability (Switzerland)*, *12*(24), 10313. https://doi.org/10.3390/ su122410313

Blomstervik, I. H., Prebensen, N. K., Campos, A. C., & Pinto, P. (2021). Novelty in tourism experiences: the influence of physical staging and human interaction on behavioural intentions. *Current Issues in Tourism*, *24*(20), 2921–2938. https://doi.org/10.1080/13683500.2020.1854197

Brulé, G., & Maggino, F. (2017). Towards more complexity in subjective well-being studies. in Brulé, g., Maggino, F. (eds) *Metrics of subjective well-being: Limits and improvements. Happiness studies book series*, 1–17, Springer. https://doi.org/10.1007/978-3-319-61810-4_1

Bruun, A., Raptis, D., Kjeldskov, J., & Skov, M. B. (2016). Measuring the coolness of interactive products: the cOOl questionnaire. *Behaviour & Information Technology*, *35*(3), 233–249. https://doi.org/10.1080/0144929X.2015.1125527

Çelik, S., & Dedeoğlu, B. B. (2019). Psychological factors affecting the behavioral intention of the tourist visiting southeastern anatolia. *Journal of Hospitality and Tourism Insights*, *2*(4), 425–450. https://doi.org/10.1108/Jhti-01-2019-0005

Chandralal, L., Rindfleish, J., & Valenzuela, F. (2015). An application of travel blog narratives to explore memorable tourism experiences. *Asia Pacific Journal of Tourism Research, 20*(6), 680–693. https://doi.org/10.1080/10941665.2014.925944

Chang, L. L., & Backman, K. F. (2016). An investigation of creative tourists' experience and revisit intention. *Proceeding of the Tourism Travel and Research Association: Advancing Tourism Research Globally*, *23*, 1–10.

Chang, L. L., Backman, L. F., & Huang, Y. C. (2014). Creative tourism: a preliminary examination of creative tourists' motivation, experience, perceived value and revisit intention. *International Journal of Culture, Tourism and Hospitality Research*, *8*(4), 401–419. https://doi.org/10.1108/iJcthr-04-2014-0032

Chang, M., Kim, J. H., & Kim, D. (2018). The effect of food tourism behavior on food festival visitor's revisit intention. *Sustainability*, *10*(10), 3534. https://doi.org/10.3390/su10103534

Chen, C., & Yoon, S. (2017). Tourism as a pathway to well-being: examining the role of novelty-seeking. *Proceeding of The 15th APacCHRIE Conference 2017 The Future Of Hospitality And Tourism: Opportunity And Challenges* (pp. 1-9). international Bali institute of tourism.

Chen, C. F., & Chou, S. H. (2019). Antecedents and consequences of perceived coolness for generation Y in the context of creative tourism - a case study of the Pier 2 art center in taiwan. *Tourism Management*, *72*, 121–129. https://doi.org/10.1016/j.tourman.2018.11.016

Chen, C. F., & Girish, V. G. (2023). Antecedents and outcomes of use experience of airport service robot: the stimulus-organism-response (s-O-r) framework. *Journal of Vacation Marketing*, *29*(4), 570–583. https://doi. org/10.1177/13567667221109267

Chen, G., So, K. K. F., Hu, X., & Poomchaisuwan, M. (2022). Travel for affection: a stimulus-organism-response model of honeymoon tourism experiences. *Journal of Hospitality & Tourism Research*, *46*(6), 1187–1219. https://doi. org/10.1177/10963480211011720

Chen, Z., suntikul, W., & King, B. (2020). Research on tourism experiencescapes: the journey from art to science. *Current Issues in Tourism*, *23*(11), 1407–1425. https://doi.org/10.1080/13683500.2019.1616679

Cheng, T. M., chang, S. Y., & Dai, Z. P. (2015). The mediating effect of situation involvement of novelty seeking and satisfaction for Yanshuei Fireworks Festival in taiwan. *International Journal of Culture, Tourism and Hospitality Research*, *9*(2), 154–167. https://doi.org/10.1108/iJcthr-10-2014-0084

Chi,C. G. Q. (2012). An examination of destination loyalty: Differences between first-time and repeat visitors. *Journal of Hospitality & Tourism Research*, *36*(1), 3–24. https://doi.org/10.1177/1096348010382235

Chiu, W., Zeng, S., & Cheng, P. S. T. (2016). The influence of destination image and tourist satisfaction on tourist loyalty: a case study of chinese tourists in korea. *International Journal of Culture, Tourism and Hospitality Research*, *10*(2), 223–234. https://doi.org/10.1108/iJcthr-07-2015-0080

Correia Loureiro, S. M., & Ferreira, E. S. (2020). Engaging visitors in cultural and recreational experience at museums. in a. arbel-tur & M. kozak (eds.), *Culture and Cultures in Tourism: Exploring New Trends,* 122–133. routledge. https://doi.org/10.4324/9780429054891-12

Coudounaris, D. N., & Sthapit, E. (2017). Antecedents of memorable tourism experience related to behavioral intentions. *Psychology & Marketing*, *34*(12), 1084–1093. https://doi.org/10.1002/mar.21048

Dakhi, P. (2025). The Influence of Experience Quality and Destination Image on The Behavioral Intentions of Lagundri Beach Tourists with Satisfaction as a Mediation. *West Science Interdisciplinary Studies, 2*(9), 1682-1691.

De Bruin, A., & Jelinčić, D. A. (2016). Toward extending creative tourism: Participatory experience tourism. *Tourism Review*, *71*(1), 57–66. https://doi.org/10.1108/tr-05-2015-0018

Dean, D., & Suhartanto, D. (2019). The formation of visitor behavioral intention to creative tourism: the role of push–pull motivation. *Asia Pacific Journal of Tourism Research*, *24*(5), 393–403. https://doi.org/10.1080/10941665.20 19.1572631

Diener, E., sandvik, E., & Pavot, W. (2009). Happiness is the frequency, not the intensity, of positive versus negative affect. In Diener E. (ed.), *Assessing well-being. Social indicators research series* (vol. 39). springer. https://doi. org/10.1007/978-90-481-2354-4_10

Dijkstra, T. K., & Schermelleh-engel, K. (2014). Consistent partial least squares for nonlinear structural equation models. *Psychometrika*, *79*(4), 585–604. https://doi.org/10.1007/s11336-013-9370-0

Dong, P., & Siu, N. Y. M. (2013). Servicescape elements, customer predispositions and service experience: the case of theme park visitors. *Tourism Management*, *36*, 541–551. https://doi.org/10.1016/j.tourman.2012.09.004

Du, J., & Wang, Y. (2025). The influence of perceived landscape value on tourists' behavioral intentions in historical and cultural blocks. *PloS one*, *20*(1), e0312491.

Fan, A., Kline, S. F., Liu, Y., & Byrd, K. (2023). Servicescape effects on hotel guests' willingness to pay premiums at different stages of pandemic: a multi-phase study. *Sustainability (Switzerland)*, *15*(21), 15252. https://doi.org/10.3390/ su152115252

Fan, Y., Isa, S. M., Yang, S., & Goh, E. (2023). Please stay with us again: investigating the mediating roles of hedonic well-being and tourism autobiographical memory in customer retention at chinese resorts. *Journal of Hospitality and Tourism Management*, *56*, 410–419. https://doi.org/10.1016/j.jhtm.2023.08.005

Fan, Y., Isa, S. M., Yang, S., & Wen, J. (2023). Effects of the guest experience, well-being, and eWOM intention for resort hotels: a positive psychology perspective. *Journal of Hospitality and Tourism Management*, *56*, 197–206. https://doi.org/10.1016/j.jhtm.2023.06.014

Fraiz, J. A., De Carlos, P., & Araújo, N. (2020). Disclosing homogeneity within heterogeneity: a segmentation of Spanish active tourism based on motivational pull factors. *Journal of Outdoor Recreation and Tourism*, *30*, 100294. https:// doi.org/10.1016/j.jort.2020.100294

Gocłowska, M. A., Ritter, S. M., Elliot, A. J., & Baas, M. (2019). Novelty seeking is linked to openness and extraversion, and can lead to greater creative performance. *Journal of Personality*, *87*(2), 252–266. https://doi.org/10.1111/ jopy.12387

Goo, J., Huang, C. D., Yoo, C. W., & Koo, C. (2022). Smart tourism technologies' ambidexterity: Balancing tourist's worries and novelty seeking for travel satisfaction. *Information Systems Frontiers: A Journal of Research and Innovation*, *24*(6), 2139 2158. https://doi.org/10.1007/s10796-021-10233-6

Hair, J., & Alamer, A. (2022). Partial least squares structural equation modeling (Pls-seM) in second language and education research: guidelines using an applied example. *Research Methods in Applied Linguistics*, *1*(3), 100027. https://doi.org/10.1016/j.rmal.2022.100027

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate data analysis* (7th ed.). Pearson education.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of Pls-seM. *European Business Review*, *31*(1), 2–24. https://www.emerald.com/insight/content/doi/10.1108/eBr-11-2018-0203/full/pdf?title=when-to-use-and-how-to-report-the-results-of-pls-sem https://doi.org/10.1108/eBr-11-2018-0203

Harris, L. C., & Ezeh, C. (2008). Servicescape and loyalty intentions: an empirical investigation. *European Journal of Marketing*, *42*(3/4), 390–422. https://doi.org/10.1108/03090560810852995

Heimtun, B., & Abelsen, B. (2012). The tourist experience and bonding. *Current Issues in Tourism*, *15*(5), 425–439. https://doi.org/10. 1080/13683500.2011.609275

Heung, V. C. S., Qu, H., & Chu, R. (2001). The relationship between vacation factors and socio-demographic and travelling characteristics: the case of Japanese leisure travellers. *Tourism Management*, *22*(3), 259–269. https://doi. org/10.1016/s0261-5177(00)00057

Huang, S., & Hsu, C. H. C. (2009). Effects of travel motivation, past experience, perceived constraint, and attitude on revisit intention. *Journal of Travel Research*, *48*(1), 29–44. https://doi.org/10.1177/0047287508328793

Huang, Y. C., Cheng, J. S., & Chang, L. L. (2020). understanding leisure trip experience and subjective well-being: an illustration of creative travel experience. *Applied Research in Quality of Life*, *15*(4), 1161–1182. https://doi.org/10.1007/ s11482-019-09727-y.

Hultman, M., Skarmeas, D., Oghazi, P., & Beheshti, H. M. (2015). Achieving tourist loyalty through destination personality, satisfaction, and identification. *Journal of Business Research*, *68*(11), 2227–2231. https://doi.org/10.1016/j.jbusres.2015.06.002

Hung, W. L., Lee, Y. J., & Huang, P. H. (2016). creative experiences, memorability and revisit intention in creative tourism. *Current Issues in Tourism*, *19*(8), 763–770. https://doi.org/10.1080/13683500.2013.877422

Huyen, K. N., & Nghi, N. Q. (2019). Impacts the tourists' motivation to search for novelty to the satisfaction and loyalty to a destination of kien giang marine and coastal adventure tourism. *International Journal of Social Science and Economic Research*, *4*(4), 2807–2818.

Im, S., Bhat, S., & Lee, Y. (2015). Consumer perceptions of product creativity, coolness, value and attitude. *Journal of Business Research*, *68*(1), 166–172. https://doi.org/10.1016/j.jbusres.2014.03.014

Jamshidi, D., Rousta, A., & Shafei, R. (2023). Social media destination information features and destination loyalty: Does perceived coolness and memorable tourism experiences matter? *Current Issues in Tourism*, *26*(3), 407–428. https://doi.org/10.1080/13683500.2021.2019204

Jebbouri, A., Zhang, H., Wang, L., & Bouchiba, N. (2021). Exploring the relationship of image formation on tourist satisfaction and loyalty: evidence from china. *Frontiers in Psychology*, *12*, 748534. https://doi.org/10.3389/ fpsyg.2021.748534

Jeloudarlou, N. S., Aali, S., Faryabi, M., & Bafandeh Zendeh, A. (2022). The effect of servicescape on customer engagement: the mediating role of customer experience. *Journal of Quality Assurance in Hospitality & Tourism*, *23*(2), 318– 344. https://doi.org/10.1080/1528008X.2020.1867696

Jiang, J. (2022). The role of natural soundscape in nature-based tourism experience: an extension of the stimulus–organism–response model. *Current Issues in Tourism*, *25*(5), 707–726. https://doi.org/10.1080/13683500.2020.1859995

Kandampully, J., Bilgihan, A., & Amer, S. M. (2023). Linking servicescape and experiencescape: creating a collective focus for the service industry. *Journal of Service Management*, *34*(2), 316–340. https://doi.org/10.1108/JOsM-08- 2021-0301

Kim, I., Jeon, S. M., & Hyun, S. S. (2012). Chain restaurant patrons' well-being perception and dining intentions: the moderating role of involvement. *International Journal of Contemporary Hospitality Management*, *24*(3), 402–429. https://doi.org/10.1108/09596111211217888

Kim, J. H. (2018). The impact of memorable tourism experiences on loyalty behaviors: the mediating effects of destination image and satisfaction. *Journal of Travel Research*, *57*(7), 856–870. https://doi.org/10.1177/0047287517721369

Kim, K. J., Shin, D. H., & Park, E. (2015). Can coolness predict technology adoption? effects of perceived coolness on user acceptance of smartphones with curved screens. *Cyberpsychology, Behavior and Social Networking*, *18*(9), 528– 533. https://doi.org/10.1089/cyber.2014.0675

Kim, M. J., Lee, C.K., & Jung, T. (2020). Exploring consumer behavior in virtual reality tourism using an extended stimulus-organism-response model. *Journal of Travel Research*, *59*(1), 69–89. https://doi.org/10.1177/0047287518818915

Knobloch, U., Robertson, K., & Aitken, R. (2017). Experience, emotion, and eudaimonia: a consideration of tourist experiences and well-being. *Journal of Travel Research*, *56*(5), 651–662. https://doi.org/10.1177/0047287516650937

Kock, F. (2021). What makes a city cool? understanding destination coolness and its implications for tourism. *Tourism Management*, *86*, 104317. https://doi.org/10.1016/j.tourman.2021.104317

Kokkhangplu, A., & Auemsuvarn, P. (2024). Understanding customer experiences insights in boutique hotels: a case study from thailand. *Cogent Business & Management*, *11*(1), 1–16. https://doi.org/10.1080/23311975.2024.2413397
Lai, K. P., & Chong, S. C. (2020). The influence of servicescape and service credibility on older adults' intention to recover: a study of rehabilitation services in Malaysia. *Journal of Health Organization and Management*, *34*(2), 101– 122. https://doi.org/10.1108/JhOM-07-2019-0215
Lee, S. Y., & Kim, J. H. (2014). Effects of servicescape on perceived service quality, satisfaction and behavioral outcomes in public service facilities. *Journal of Asian Architecture and Building Engineering*, *13*(1), 125–131. https://doi. org/10.3130/jaabe.13.125
Lee, Y. J. (2024). Destination fascination, well-being, and the reasonable person model of behavioural intention in heritage tourism. *Current Issues in Tourism*, *27*(2), 288–304. https://doi.org/10.1080/13683500.2023.2178395
Li, P. Q., & Kovacs, J. F. (2024). Creative tourism and visitor motivation. *International Journal of Tourism Research*, *26*(1), e2601. https://doi.org/10.1002/jtr.2601
Lin, J.H., Lee, S. J., Yeh, C., Lee, W.H., & Wong, J.Y. (2014). Identifying gender differences in destination decision making. *Journal of Tourism and Recreation*, *1*(1), 1–11. https://doi.org/10.12735/jotr.v1i1p01
Liu, L., Zhou, Y., & Sun, X. (2023). The impact of the wellness tourism experience on tourist well-being: the mediating role of tourist satisfaction. *Sustainability (Switzerland)*, *15*(3), 1872. https://doi.org/10.3390/su15031872
Liu, X., Li, J. J., & Kim, W. G. (2017). The role of travel experience in the structural relationships among tourists' perceived image, satisfaction, and behavioral intentions. *Tourism and Hospitality Research*, *17*(2), 135–146. https://doi. org/10.1177/1467358415610371
López Bonilla, J. M., López Bonilla, L. M., & Sanz Altamira, B. (2011). Consumer innovative behavior in vacation travel. *Tourism & Management Studies*, *1*, 135–142. https://dialnet.unirioja.es/descarga/articulo/5018545.pdf%5cnhttps:// dialnet.unirioja.es/servlet/extart?codigo=5018545
Loureiro, S. M. C., & Blanco, T. M. (2023). Museum coolness: creating the desire to revisit. *Tourism Recreation Research*, *48*(1), 94–109. https://doi.org/10.1080/02508281.2021.1885799
Mak, A. H. N. (2014). Novelty, tourism. in Jafari J., Xiao h. (eds.), *Encyclopedia of Tourism*, 1–3, Springer. https:// doi.org/10.1007/978-3-319-01669-6_460-1
Mattila, A. S., & Gao, L. (2017). Atmospherics and the touristic experience. in Fesenmaier, D., & Xiang, Z. (eds.), *Design science in tourism*, 151–160, tourism on the Verge. springer. https://doi.org/10.1007/978-3-319-42773-7_10
Mehrabian, A., & Russell, J. A. (1974). An approach to environmental psychology. the Mit Press.
Mun, N. Y., Lee, W., & Jeong, C. (2018). Traveling from south to north: the relationships between historical nostalgia, novelty seeking, and attitudes to visit north korea. *International Journal of Tourism Sciences*, *18*(3), 170–191. https:// doi.org/10.1080/15980634.2018.1517934
Munawar, F., Munawar, R., & Tarmidi, D. (2021). The impact of perceived coolness, destination uniqueness and tourist experience on revisit intention: a geographical study on cultural tourism in indonesia. *Review of International Geographical Education Online*, *11*(1), 400–411.
Nian, S., Li, D., Zhang, J., Lu, S., & Zhang, X. (2023). stimulus-organism-response framework: is the perceived outstanding universal value attractiveness of tourists beneficial to world heritage site conservation? *International Journal of Environmental Research and Public Health*, *20*(2), 1189. https://doi.org/10.3390/ijerph20021189
Noaime, E., & Mashary Alnaim, M. (2023). Examining the symbolic dimension of aleppo's historical landmarks. *Alexandria Engineering Journal*, *78*, 292–305. https://doi.org/10.1016/j.aej.2023.07.054
Nuerbiya, A. (2015). *The effect of perceived autonomy on young Chinese customers' perception of coolness*. seoul national university.
Pai, C. K., Liang, J., Chen, H., & Zhang, J. (2025). Exploring the impact of destination coolness on self-identity and destination advocacy among Generation Z tourists: a self-identity theory perspective. *Asia Pacific Journal of Tourism Research*, 1-16.
Peng, Y., Wang, E. Y., & Lam, D. (2022). Build it and they will come? the impact of servicescape on chinese millennials' satisfaction and behavioral intentions toward integrated resorts. *International Journal of Hospitality & Tourism Administration*, *23*(3), 576–598. https://doi.org/10.1080/15256480.2020.1805090
Petrick, J. F., Morais, D. D., & Norman, W. C. (2001). An examination of the determinants of entertainment vacationers' intentions to revisit. *Journal of Travel Research*, *40*(1), 41–48. https://doi.org/10.1177/004728750104000106
Pomfret, G. (2021). Family adventure tourism: towards hedonic and eudaimonic wellbeing. *Tourism Management Perspectives*, *39*, 100852. https://doi.org/10.1016/j.tmp.2021.100852
Pratminingsih, S. A., Munawar, F., & Rudatin, C. L. (2025). Creative tourism experience: exploring the influence of novelty-seeking, perceived coolness and servicescape on behavioral intention. *Cogent Business & Management*, *12*(1), 2447906.
Pung, J. M., gnoth, J., & Del chiappa, G. (2020). Tourist transformation: towards a conceptual model. *Annals of Tourism Research*, *81*, 102885. https://doi.org/10.1016/j.annals.2020.102885
Qian, L., Zheng, C., Wang, J., Pérez sánchez, M., de los, Á., Parra lópez, E., & Li, H. (2022). Dark tourism destinations: the relationships between tourists' on-site experience, destination image and behavioural intention. *Tourism Review*, *77*(2), 607–621. https://doi.org/10.1108/tr-08-2020-0360
Ramos-garcía, J. L., Vargas-chanes, D., & Toledo-lópez, A. (2023). Perception of social prosperity in indigenous tourism destinations in Mexico: the mediator effect of competitiveness of the destinations. *Cogent Business & Management*, *10*(2), 1–22. https://doi.org/10.1080/23311975.2023.2235105
Rasoolimanesh, S. M., Seyfi, S., Hall, C. M., & Hatamifar, P. (2021). Understanding memorable tourism experiences and behavioural intentions of heritage tourists. *Journal of Destination Marketing & Management*, *21*, 100621. https://doi. org/10.1016/j.jdmm.2021.100621
Rasoolimanesh, S. M., Seyfi, S., Rather, E. A., & Hall, C. M. (2022). Investigating the mediating role of visitor satisfaction in the relationship between memorable tourism experiences and behavioral intentions in heritage tourism context. *Tourism Review*, *77*(2), 687–709. https://doi.org/10.1108/tr-02-2021-0086
Reitsamer, B. F., & Brunner-Sperdin, A. (2017). Tourist destination perception and well-being: What makes a destination attractive? *Journal of Vacation Marketing*, *23*(1), 55–72. https://doi.org/10.1177/1356766715615914
Richards, G. (2011). Creativity and Tourism: the state of the art. *Annals of Tourism Research*, *38*(4), 1225–1253. https:// doi.org/10.1016/j.annals.2011.07.008
Richards, G. (2020). Designing creative places: the role of creative tourism. *Annals of Tourism Research*, *85*, 102922. https://doi.org/10.1016/j.annals.2020.102922
Rodrigues, Á., Loureiro, S. M. C., Lins De Moraes, M., & Pereira, R. G. (2023). Memorable tourism experience in the context of astrotourism. *Anatolia*, *34*(2), 235–247. https://doi.org/10.1080/13032917.2021.2015695
Rosenbaum, M. S., & Massiah, C. (2011). An expanded servicescape perspective. *Journal of Service Management*, *22*(4), 471–490. https://doi.org/10.1108/09564231111155088
Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: a review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, *52*(1), 141–166. https://doi.org/10.1146/annurev.psych.52.1.141

Scheyvens, R., & Biddulph, R. (2020). Inclusive tourism development. in J. saarinen (ed.), *Tourism and sustainable development goals: Research on sustainable tourism geographies*, 45–65, Routledge. https://doi. org/10.1201/9780429324253-4

Selem, K. M., Sigala, M., Shoukat, M. H., Shehata, A. E., & Mkheimer, I. M. (2023). Unperplexing the nexus between physical evidence and guest retention at beach resorts: Multiple sequential mediation models. *Journal of Hospitality Marketing & Management*, *32*(6), 717–744. https://doi.org/10.1080/19368623.2023.2203182

Skavronskaya, L., Moyle, B., Scott, N., & Kralj, A. (2020). The psychology of novelty in memorable tourism experiences. *Current Issues in Tourism*, *23*(21), 2683–2698. https://doi.org/10.1080/13683500.2019.1664422

Sthapit, E., Bjork, P., Coudounaris, D. N., Jiménez-Barreto, J., & Vo-Thanh, T. (2024). Antecedents and outcomes of memorable volunteer tourism experiences. *Journal of Hospitality and Tourism Insights*, *7*(1), 56–75. https://doi. org/10.1108/Jhti-08-2022-0386

Sthapit, E., Björk, P., Piramanayagam, S., & Coudounaris, D. N. (2023). Antecedents and outcomes of memorable halal food experiences of non-Muslim tourists. *Journal of Islamic Marketing*, *14*(4), 913–936. https://doi.org/10.1108/ JiMa-08-2021-0271

Sthapit, E., Coudounaris, D. N., & Björk, P. (2019). Extending the memorable tourism experience construct: an investigation of memories of local food experiences. *Scandinavian Journal of Hospitality and Tourism*, *19*(4–5), 333–353. https://doi.org/10.1 080/15022250.2019.1689530

Sthapit, E., garrod, B., Coudounaris, D. N., Seyfi, S., Cifci, I., & Vo-thanh, T. (2024). Antecedents of memorable heritage tourism experiences: an application of stimuli–organism–response theory. *International Journal of Tourism Cities*, *10*(4), 1469–1487. https://doi.org/10.1108/iJtc-02-2024-0051

Suhartanto, D., Brien, A., Primiana, I., Wibisono, N., & Triyuni, N. N. (2020). Tourist loyalty in creative tourism: the role of experience quality, value, satisfaction, and motivation. *Current Issues in Tourism*, *23*(7), 867–879. https://doi.org/ 10.1080/13683500.2019.1568400

Tan, S. E., Aziz, Y. A., Khairil, W. A., & Zaiton, S. (2015). Linking servicescape, tourist satisfaction and overall tour guiding experience: the case of taman negara national Park, Malaysia. *Pertanika Journal of Social Science and Humanities*, *23*(January), 33–48.

Tarka, P., Kukar-kinney, M., & Karnish, R. J. (2022). Consumers' personality and compulsive buying behavior: the role of hedonistic shopping experiences and gender in mediating-moderating relationships. *Journal of Retailing and Consumer Services*, *64*, 102802. https://doi.org/10.1016/j.jretconser.2021.102802

Tran, H. (2022). Effect of memorable tourism experiences on revisit intention to community-based tourism destination of domestic tourists in Vietnam. Proceedings of *the International Conference on Research in Management & Technovation*, 28, 307–313. https://doi.org/10.15439/2021kM44

Trinanda, O., Sari, A. Y., Cerya, E., & Riski, T. R. (2022). Predicting place attachment through selfie tourism, memorable tourism experience and hedonic well-being. *International Journal of Tourism Cities*, *8*(2), 412–423. https://doi. org/10.1108/iJtc-09-2020-0188

Tsai, C. T. S. (2016). Memorable tourist experiences and place attachment when consuming local food. *International Journal of Tourism Research*, *18*(6), 536–548. https://doi.org/10.1002/jtr.2070

Tsaur, S. H., Teng, H. Y., Han, T. C., & Tu, J. H. (2023). Can perceived coolness enhance memorable customer experience? the role of customer engagement. *International Journal of Contemporary Hospitality Management*, *35*(12), 4468–4485. https://doi.org/10.1108/iJchM-08-2022-1031

Türker, N., Gökkaya, S., & Acar, A. (2019). Measuring the effect of restaurant servicescapes on customer loyalty. *Tourism Academic Journal*, *6*(2), 255–270.

Vada, S., Prentice, A., & Hsiao, A. (2019a). The influence of tourism experience and well-being on place attachment. *Journal of Retailing and Consumer Services*, *47*, 322–330. https://doi.org/10.1016/j.jretconser.2018.12.007

Vada, S., Prentice, C., & Hsiao, A. (2019b). The role of positive psychology in tourists' behavioural intentions. *Journal of Retailing and Consumer Services*, *51*, 293–303. https://doi.org/10.1016/j.jretconser.2019.06.015

Vespestad, M. K., & Mehmetoglu, M. (2015). Gender differences in vacation behavior. *Tourism Review International*, *19*(3), 147–161. https://doi.org/10.3727/154427215X14430967453670

Wang, C., Liu, J., Wei, L., & Zhang, T. (2020). Impact of tourist experience on memorability and authenticity: a study of creative tourism. *Journal of Travel & Tourism Marketing*, *37*(1), 48–63. https://doi.org/10.1080/10548408.2020. 1711846

Wei, C., Zhao, W., Zhang, C., & Huang, K. (2019). Psychological factors affecting memorable tourism experiences. *Asia Pacific Journal of Tourism Research*, *24*(7), 619–632. https://www.tandfonline.com/doi/abs/10.1080/10941665.2019. 1611611

Wurzburger, R., Pratt, S., & Pattakos, A. (2009). *Creative tourism: A global conversation*. Sunstone.

Xiong, W., Huang, M., Okumus, B., chen, S., & Fan, F. (2022). The predictive role of tourist-generated content on travel intentions: emotional mechanisms as mediators. *Asia Pacific Journal of Tourism Research*, *27*(5), 443–456. https://doi.org/10.1080/10941665.2022.2075778

Xue, J., Zhou, Z., Majeed, S., Chen, R., & Zhou, N. (2022). Stimulating tourist inspiration by tourist experience: The moderating role of destination familiarity. *Frontiers in Psychology*, *13*, 895136. https://doi.org/10.3389/fpsyg.2022.895136

Xu, X., & Gursoy, D. (2020). Exploring the relationship between servicescape, place attachment, and intention to recommend accommodations marketed through sharing economy platforms. *Journal of Travel & Tourism Marketing*, *37*(4), 429–446. https://doi.org/10.1080/10548408.2020.1784365

Yu, Z., Klongthong, W., Thavorn, J., & Ngamkroeckjoti, C. (2021). Understanding rural Chinese consumers' behavior: A stimulus–organism–response (SOR) perspective on Huawei's brand loyalty in China. *Cogent Business & Management*, *8*(1), 1880679.

Zhang, H., Wu, Y., & Buhalis, D. (2018). A model of perceived image, memorable tourism experiences and revisit intention. *Journal of Destination Marketing & Management*, *8*, 326–336. https://doi.org/10.1016/j.jdmm.2017.06.004

Zhang, Z., Li, J., Jones, P. R., Yu, R., & Guo, C. (2024). How coolness drives brand performance: Findings from asymmetric and symmetric approaches. *Current Issues in Tourism*. Forthcoming.

Zhao, Y., Yang, J., Song, J., & Lu, Y. (2025). The Effects of Tourism Motivation and Perceived Value on Tourists' Behavioral Intention Toward Forest Health Tourism: The Moderating Role of Attitude. *Sustainability*, *17*(2), 713.

Zhuang, F., Zhou, Y., Zhang, F., Ao, X., Xie, X., & he, Q. (2018). Cross-domain novelty seeking trait mining for sequential recommendation. *Proceedings of ACM SIGKDD, London, United Kingdom, Aug 2018 (KDD'18). ArXiv.* https://sci-hub. do/https://link.springer.com/content/pdf/10.1007/s11390-020-9945-z.pdf.

Article history: Received: 18.02.2025 Revised: 26.05.2025 Accepted: 18.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1290-1301
DOI 10.30892/gtg.602spl25-1501

ONLINE REVIEWS CAN TELL US HOW THE EXPERIENCE OF THE GUEST WITH THE VIETNAMESE HOTEL

Quyet Dinh PHAN [1], **Linh Phuong NGUYEN** [1*], **Ha Thi Thu NGUYEN** [2]

[1] Thuongmai University, Strategic Management Department, Hanoi, Vietnam; quyetphan@tmu.edu.vn (Q.D.P.); linhnguyen@tmu.edu.vn (L.P.N.)
[2] FPT University, Greenwich Department, Hanoi, Vietnam; hantt194@fe.edu.vn (H.T.T.N.)

Citation: Phan, Q.D., Nguyen, L.P., & Nguyen, H.T.T. (2025). Online reviews can tell us how the experience of the guest with the Vietnamese hotel. *Geojournal of Tourism and Geosites*, 60(2spl), 1290–1301. https://doi.org/10.30892/gtg.602spl25-1501

Abstract: Online booking systems have transformed the travel industry by creating vast information platforms. These platforms enable customers to share their experiences, significantly influencing the destination choices of others. For hoteliers, this wealth of user-generated content is an invaluable resource, offering direct insight into the guest perspective. Consequently, analyzing this feedback has become essential for understanding and improving customer satisfaction. Although many studies have employed machine learning techniques to analyze sentiment in this data, these methods have overlooked the specific context of natural language, failing to capture the specific context and linguistic nuance embedded in customer reviews. This study aims to explore customer satisfaction with Vietnamese hotels using a mixed-methods approach. This approach combines linguistic rules, sentiment corpora, and the Python VADER library to mine the big data of customer reviews effectively. By combining algorithms and formulas, the research can measure guest satisfaction with specific aspects of the hotel. The data for this study were collected from TripAdvisor, and it is a large dataset of 32,447 individual reviews of over one thousand hotels in Vietnam. To achieve a high degree of detail, a granular 1–5 scoring scale was implemented, allowing for the classification of feedback into specific categories ranging from "strongly dissatisfied" to "strongly satisfied" for each distinct aspect of the hotel experience, such as service, staff, and cleanliness. The findings revealed an overall customer satisfaction rate with the hotel's quality at 84.3%. Interestingly, the highest satisfaction score for the "staff" aspect was slightly higher at 84.83%, highlighting a subtle discrepancy between general guest sentiment and their experiences with particular amenities or services. The results confirm that a linguistic rule-based method provides a more detailed and accurate understanding of customer satisfaction. This approach helps hotel management to understand and pinpoint specific operational areas that require improvement or reinforcement. It offers deeper insights into customer preferences and facilitates the creation of customer personas. In a highly competitive hospitality market, this study also provides a clear viewpoint for making targeted enhancements to gain a competitive edge.

Keywords: online reviews, Vietnamese hotel, guest experience, big data analysis, Python, linguistic rule

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INTRODUCTION

Customer experience (CX) has become a key competitive advantage in today's crowded marketplace. Delivering a positive experience not only builds customer loyalty but also contributes directly to business growth. Companies that prioritize CX often see higher customer satisfaction, increased retention, and a stronger brand image (Rahimian et al., 2021; Permatasari et al., 2025; Veloso & Gomez-Suarez, 2023; Altun et al., 2025; Chittiprolu et al., 2021). One of the touchpoints influencing CX is online reviews. Positive reviews can boost a company's credibility and attract new customers, while negative feedback offers valuable insights for improvement (Xu et al., 2025; Zhao et al., 2025). With the growing popularity of sharing experiences on social media and review platforms, customer voices now carry more weight than ever. When customers share positive experiences, it acts as organic, word-of-mouth marketing, helping businesses expand their reach and build trust with potential clients. On the other hand, negative reviews can damage a brand's reputation if not handled effectively (Xu et al., 2025). Some studies emphasized that leveraging online reviews, encouraging positive sharing, and implementing efficient online booking systems are key strategies to enhance CX. By focusing on these elements, businesses can build lasting relationships with their customers and drive long-term success (Sadiasa et al., 2025; Altun et al., 2025; Amoako et al., 2023).

Modern travelers are increasingly utilizing omnichannel approaches for journey planning, drawing from various information sources before making decisions (Mensah et al., 2025). Online reviews, especially from booking platforms, significantly influence their choices (Zheng et al., 2023; Nguyen & Nguyen, 2023; Alhassan, 2025). These reviews offer essential insights into service quality and whether accommodations adhere to international standards (Mensah et al., 2025; Kalnaovakul et al., 2025; Glaveli et al., 2023; Adiningtyas & Millanyani, 2024). Feedback from prior guests assists prospective visitors in evaluating destinations, services, and overall experiences (Glaveli et al., 2023; Chittiprolu et al., 2021; Tango et al., 2024). Consequently, platforms such as Agoda, Airbnb, Trip.com, and Tripadvisor have experienced remarkable global expansion, becoming essential tools in travel planning (Alhassan, 2025; Guttentag et al., 2025; Khorsand

[*] Corresponding author

et al., 2020; Sadiasa et al., 2025). The tourism sector has become more digitally interconnected, with most businesses engaging in a global online ecosystem. This digital evolution has expanded the industry's reach and intensified international competition (Adiningtyas & Millanyani, 2024). In this rapid and interconnected landscape, providing exceptional customer experiences is essential. Companies that prioritize technology services are more likely to thrive in this competitive market, where travelers prioritize transparency, quality, and convenience throughout their journey (Amoako et al., 2023).

The global hotel industry is facing heightened competition, largely driven by the growth of online booking platforms (Alhassan, 2025; Cho et al., 2024). In this competitive environment, customer satisfaction has emerged as a key determinant of success. It directly influences customer loyalty, repeat business, brand reputation, and overall revenue generation (Cho et al., 2024; Glaveli et al., 2023). Given the industry's scale and diversity, numerous researchers have investigated customer satisfaction across hotels of various star ratings, particularly from 3-star to 5-star establishments (Adiningtyas & Millanyani, 2024; Kalnaovakul et al., 2025). In traditional approaches, hotels measure customer satisfaction through structured questionnaire surveys. While useful, this method has several limitations. Surveys typically yield a limited number of responses—often only a few hundred—and are restricted to predefined questions, which may not fully reflect the depth and variety of customer experiences (Rahimian et al., 2021). Recognizing these shortcomings, the hotel industry has turned to more dynamic data monitoring and control methods. One such approach involves analyzing online reviews posted by guests on platforms such as Tripadvisor and Agoda. These reviews offer a more spontaneous and authentic reflection of customer sentiment, providing valuable insights into satisfaction levels and areas for improvement (Bigne et al., 2023). This shift towards leveraging user-generated content has transformed how hotels evaluate performance and adapt to evolving customer expectations (Garner & Kim, 2022; Glaveli et al., 2023; Islam, 2025; Tango et al., 2024).

Vietnam is rapidly emerging as a premier tourism destination, celebrated for its vibrant cultural heritage and natural beauty (Nguyen & Nguyen, 2023; Nguyen et al., 2025; Le et al., 2025). The General Statistics Office of Vietnam (2024) reports that the country is expected to welcome 17.6 million international visitors in 2024, reflecting its growing appeal on the global stage. Vietnam offers a wide array of attractions, from the terraced rice fields of Sapa and the iconic limestone formations of Ha Long Bay to the dynamic urban life of Hanoi and Ho Chi Minh City. This diversity positions Vietnam as a versatile and desirable destination for a broad spectrum of travelers (Nguyen & Nguyen, 2023). Despite this strong potential, Vietnam's tourism industry faces significant competition, both globally and within Southeast Asia (Thuy et al., 2024). Internationally, it contends with neighboring countries like Thailand and Indonesia, while domestically, various regions compete to attract tourists by enhancing their unique cultural and natural assets (Thuy et al., 2024; Nguyen et al., 2025). In this increasingly competitive environment, delivering outstanding customer experiences has become essential (Thuy et al., 2024). Vietnam has to care for service quality that aligns with international standards. Providing memorable and consistent visitor experiences not only helps build a strong reputation but also encourages tourist loyalty and repeat visits. By focusing on customer satisfaction and continuously improving service offerings, Vietnam can strengthen its position as a leading tourism destination, appealing to both international travelers and its growing domestic tourism market (Thuy et al., 2024; Nguyen & Nguyen, 2023).

In recent years, there has been a growing body of research focusing on the analysis of customer review data, which has gained significant attention in the academic and business communities (Park et al., 2020; Shi et al., 2025; Yang et al., 2024; Zarezadeh et al., 2022). Customer reviews offer a rich and easily accessible resource for real-time data mining, reflecting the emotions and opinions of customers following their experiences with hotel services (Ahmad et al., 2025; Bigne et al., 2023; Davoodi et al., 2025; Moreno Brito et al., 2024). These reviews provide valuable insights into customer satisfaction and dissatisfaction (Derco & Tometzová, 2025; Li et al., 2020; Moreno Brito et al., 2024). However, when the volume of reviews grows significantly, traditional analysis methods become insufficient. To overcome this challenge, advanced techniques such as machine learning, artificial intelligence, and natural language processing have been employed (Özen & Özgül Katlav, 2023;). The insights gained from these advanced analyses are not only valuable for researchers but also highly beneficial for hotel managers, as they can be directly applied to enhance business operations (Permatasari et al., 2025; Thuy et al., 2024; Bigne et al., 2023). Despite the growing interest in this area, existing research rarely utilizes linguistic rules to thoroughly investigate the specific factors behind customer dissatisfaction in satisfaction ratings (Lee et al., 2025; Bigne et al., 2023; Nguyen & Nguyen, 2023). Moreover, there has been limited focus on classifying customer satisfaction into 1-5 levels, like the Likert measurement, offering further potential for improvement in analysis methods (Bigne et al., 2023; Nguyen & Nguyen, 2023; Adiningtyas & Millanyani, 2024).

In this research, we developed new customer satisfaction measurement formulas by integrating linguistic rules with inferential statistical methods. To collect the necessary data, we utilized a tool to gather hotel reviews from Vietnam. We then applied the Python VADER (Valence Aware Dictionary and Sentiment Reasoner) Library to analyze customer satisfaction levels from 32,447 reviews. While similar methods have been used in recent studies (Bigne et al., 2023; Nguyen & Nguyen, 2023; Lee et al., 2025), our approach was innovative, as we tested it with a new dataset that combined linguistic rules, the Sentinet corpora, and sentiment analysis techniques. The dataset was collected from a wide range of Vietnamese hotels, from 3-star to 5-star ratings, and included reviews from 1,495 hotels in Vietnam. This dataset allowed us to assess the overall guest experience across various hotel categories, whereas many previous studies focused only on luxury hotels (Moreno Brito et al., 2024). Our approach enabled a systematic evaluation and quantification of customer sentiment, providing valuable insights into satisfaction trends and patterns within the Vietnamese hotel sector. This study not only measures customer satisfaction at both the overall and aspect levels, but it also assigns aspect scores on a 5-level scale, from 1 star to 5 stars. Through this, we aim to establish a process for mining big data to better understand guest experiences with Vietnamese hotels, contributing to the improvement of service quality in the industry. The remainder of this paper is organized into four sections. Section 2 addresses research-related issues, including key concepts, definitions, and a comprehensive review of relevant literature on data analysis. Section 3 outlines the research methodology, detailing the approaches, tools, and techniques used to collect and analyze data. Section 4 presents the research findings, followed by a detailed discussion of the results. Finally, the conclusion summarizes the key outcomes of the study, reflects on its contributions, and suggests potential directions for future research.

LITERATURE REVIEW

1. The importance of hotel big data mining

Big data has become crucial across many industries, including hotels. When analyzed effectively, it offers significant opportunities for hotel managers to improve operations, enhance customer experiences, and drive business growth (Nguyen & Ho, 2023; Olorunsola et al., 2023). By leveraging large datasets, hotels gain valuable insights into customer preferences, booking behaviors, and feedback, enabling them to tailor services and marketing strategies (Olorunsola et al., 2023; Peco-Torres et al., 2025). Additionally, big data supports the optimization of pricing models, the enhancement of workflows, and the prediction of future trends, giving hotels a competitive edge. As the hospitality industry evolves, effective big data utilization will be crucial for hotel managers aiming to meet guest expectations (Zhao et al., 2025).

Online booking platforms have made the modern tourism industry with vast amounts of data, which hotel managers leverage to enhance their services and improve guest experiences. By analyzing customer reviews, hotels gain valuable insights into traveler preferences, enabling them to make informed decisions that better align with guest expectations (Chalupa & Petricek, 2024; Le et al., 2024; Zarezadeh et al., 2022; Yang et al., 2024; Zheng et al., 2023). This process allows hotel managers to assess customer sentiment, improve service quality, and optimize operational costs. Furthermore, reviews serve as a powerful tool for word-of-mouth marketing, strengthening the hotel’s reputation and attracting more customers (Peco-Torres et al., 2025; Permatasari et al., 2025). Compared to traditional methods like surveys, collecting customer feedback from reviews is both cost-effective and efficient, offering a more objective and real-time understanding of customer psychology (Nguyen et al., 2025; Barzizza et al., 2025; Okpa et al., 2025). However, the large volume of data generated requires advanced techniques such as data mining, artificial intelligence, and statistical models to ensure accurate and efficient analysis (Le et al., 2025; Xu et al., 2025; Yang et al., 2024; Zhao et al., 2025; Zhuang et al., 2025; Shi et al., 2025; Cuesta-Valiño et al., 2025). One key problem of using this data is measuring customer satisfaction, both at an overall level and in-service aspects (Veloso & Gomez-Suarez, 2023). By understanding how guests perceive different elements of their stay, hotels can refine their offerings and improve service quality (Baek et al., 2020; Kalnaovakul et al., 2025). A solution for this problem is evaluating hotel service quality through customer reviews (Leal et al., 2019). Analyzing guest feedback helps identify strengths and areas for improvement, leading to better overall customer experiences. Additionally, technological advancements have facilitated the creation of automated destination recommendation systems, which rely on customer feedback to suggest personalized travel options (Yang et al., 2024). Furthermore, customer segmentation plays a crucial role in personalizing services and marketing strategies (Yang et al., 2024; Barzizza et al., 2025). By categorizing guests based on behavior, preferences, or demographics, hotels can tailor their services to meet specific needs, boosting customer satisfaction and fostering loyalty (Chalupa & Petricek, 2024).

2. Text mining and Python tool

Text mining is an essential branch of data mining that draws significant insights from textual data. By employing statistical and machine learning techniques, it uncovers patterns and trends, transforming complex information into simpler tasks. These tasks include categorization, classification, clustering, concept extraction, sentiment analysis, summarization, and relationship modeling. Sentiment analysis, a prominent text mining application, is crucial for businesses aiming to enhance customer service (Ahmad et al., 2025). It deciphers the emotional tones within the text, particularly in customer reviews, revealing customer preferences and behaviors. Hotel managers leverage sentiment analysis to make data-driven decisions. Specifically, analyzing sentiment-laden adjectives within reviews allows for accurate assessments of customer satisfaction, providing a deeper understanding of their emotional responses and overall perceptions. This process helps organizations tailor their services and improve customer experiences.

Most of the customer reviews on online booking platforms are unstructured data. Although this data can be understood, it requires aggregation for effective analysis and information extraction. Reviews often convey customers' sentiments and opinions regarding their hotel service experiences (Kalnaovakul et al., 2025; Nguyen et al., 2025; Baek et al., 2020; Bigne et al., 2023). Hotel managers typically seek to comprehend customer psychology through these reviews, necessitating manual reading. However, with large volumes of data, manual reading becomes difficult, so they need a tool to automatically mine and analyze information, summarizing the results (Yang et al., 2024; Veloso & Gomez-Suarez, 2023). Following this way, hotel managers can determine whether customers are satisfied or dissatisfied with the provided hotel services and aspects. This process is also referred to as aspect-based extraction in customer sentiment analysis. To extract attributes and aspects from customer review data regarding service quality, it is essential to identify keywords that reflect their perceptions of hotel attributes. Nouns primarily represent the mentioned hotel services in customer reviews; hence, if many customers refer to them, then their occurrence frequency will be high (Nguyen & Nguyen, 2023).

Python is a programming that is widely used in text mining and sentiment analysis. One of its powerful tools is the VADER (Valence Aware Dictionary and Sentiment Reasoner) library, specifically designed for sentiment analysis. VADER excels at analyzing text data, particularly social media content, by evaluating the sentiment expressed in words and phrases. It assigns sentiment scores to text, identifying whether the tone is positive, negative, or neutral. Vader is optimized for social media data and can yield good results with data from Twitter, Facebook, and more. As the above results show, words' polarity and probabilities are pos, neg, neu, and compound words (Hutto & Gilbert, 2022). By leveraging Python and VADER, businesses and researchers can efficiently mine text data, extract meaningful insights, and understand customer emotions, making it a valuable tool for enhancing decision-making and improving customer experiences.

3. Big Data analysis for understanding customer experience

The Internet customer experience refers to how individuals perceive and interact with products or services in an online environment, as well as how they express these perceptions through digital platforms. Unlike traditional customer experiences, online interactions occur rapidly, allowing businesses to manage customer feedback in real time (Alhassan, 2025; Garner & Kim, 2022; Khorsand et al., 2020). The ease and speed of digital communication make it simpler for companies to respond to concerns, resolve issues, and engage with customers quickly. However, this immediacy also means that negative experiences can have swift and far-reaching consequences. A single poor online interaction can significantly impact a customer's perception, sometimes leading them to abandon a brand entirely. Even reading a negative review or encountering difficulties navigating a company's website can cause customers to disengage instantly (Xu et al., 2025; Adiningtyas & Millanyani, 2024). Therefore, businesses must strongly focus on delivering a seamless and positive online experience. A well-managed internet customer experience is key to building customer loyalty and sustaining competitive advantage in the digital age (Cho et al., 2024; Kalnaovakul et al., 2025).

In recent years, the study of text mining applied to customer-generated content has gained increased attention, particularly in the hotel industry, where online reviews play a crucial role in shaping potential customers' choices (Moreno Brito et al., 2024; Nguyen & Ho, 2023; Ahmad et al., 2025; Tango et al., 2024). Numerous studies have demonstrated the effectiveness of text mining as a robust approach for analyzing extensive amounts of customer feedback. Even when handling datasets with millions of records, the text mining process remains efficient and manageable (Chalupa & Petricek, 2024; Le et al., 2025; Zarezadeh et al., 2022). This technique has become vital for big data analysis in the hospitality industry, especially for assessing customer sentiment and satisfaction. Customer-generated content is prevalent across various digital platforms, including prominent booking websites like Booking. com, Hotels. com, Google Maps, TripAdvisor, and online travel forums (Lee et al., 2024; Garner & Kim, 2022; Islam, 2025; Okpa et al., 2025). TripAdvisor, in particular, is a popular choice in academic research due to its reliable algorithms that help identify and filter fake reviews, ensuring the datasets are more trustworthy (Islam, 2025). Researchers often concentrate on reviews from specific hotel groups to gain in-depth insights into customer satisfaction within certain regions or localized establishments, such as eco-friendly hotels. In Lee's study (Lee et al., 2024), the quality of user-generated content was explored regarding aspects like readability, polarity, word length, and diversity, along with their implications for guest satisfaction in luxury gaming resorts in Las Vegas. They analyzed 12,940 textual reviews from six luxury hotels located in these prestigious gaming destinations, utilizing regression analysis to establish the relationship between the variables in the customer reviews and overall satisfaction. Furthermore, Yang's research (Yang et al., 2024) proposed a ranking of 11 hotels in Chengdu on Tripadvisor. com, accompanied by a comparative analysis to validate the effectiveness of their model. Management implications are discussed for practitioners aiming to enhance hotel management quality. The use of text mining provides a more comprehensive understanding of service quality and traveler expectations (Chalupa & Petricek, 2024). Identifying the topic has been a central focus in customer sentiment analysis (Özen & Özgül Katlav, 2023). This process involves extracting relevant entities, such as identifying aspects of hotel services like "room" or terms that convey sentiment, such as "good" or "terrible." Various techniques, including Latent Dirichlet Allocation (LDA), have been employed to achieve this extraction (Shi et al., 2025; Kalnaovakul et al., 2025). In Shi's study, a sentiment dictionary specific to the cruise industry is created using online reviews.

This involves selecting initial sentiment words based on their frequency and further expanding the dictionary through Word2vec and pointwise mutual information for semantic orientation. Additionally, they employ the latent Dirichlet allocation topic model to examine online reviews and pinpoint the 10 urgent issues that concern cruise customers. Studies indicate that key topic words in customer reviews are often nouns. Consequently, researchers have concentrated on extracting frequently mentioned words that signify important aspects of the customer experience (Nguyen & Nguyen, 2023). These words are categorized as hotel service topics (or aspects), including "restaurant," "breakfast," "food," "pool," "reservation," "buffet," "lounge," "bar," "check-in," "floor," "view," "cleanliness," "bed," "bathroom," and "staff." These aspects help define the essential elements that shape a guest's overall hotel experience. There are some challenging issues in this field. A majority of the previous studies have focused on measuring overall customer satisfaction and the level of satisfaction with each aspect of hotel services (Adiningtyas & Millanyani, 2024; Barzizza et al., 2025). One key area of focus in these studies is aspect extraction and analysis (Özen & Özgül Katlav, 2023). The common approach involves the use of statistical techniques based on frequency analysis to identify customer preferences for specific services. For example, customers frequently mention certain aspects such as Location, Room, Service, Dining & Food, Value, and Facility Availability in their reviews (Nguyen & Nguyen, 2023). Kalnaovakul found that eight dimensions of service quality were identified, including leisure activities, tangibles and surroundings, reliability, responsiveness, service process, food, empathy, and ambiance. The study highlights that the service process is the only dimension displaying negative sentiment (Kalnaovakul et al., 2025).

Conversely, other studies use negative sentiment analysis to identify aspects that lead to customer dissatisfaction (Xu et al., 2025; Adiningtyas & Millanyani, 2024). Customer reviews frequently highlight complaints regarding facilities, rooms, and pricing. Adiningtyas suggested that hotels focus on enhancing particular areas needing improvement (Adiningtyas & Millanyani, 2024). Although statistical frequency methods are commonly employed, other research has investigated the links between particular factors and polarity words to evaluate satisfaction through inferential statistics (Zheng et al., 2023;

Derco & Tometzová, 2025; Amoako et al., 2023; Rahimian et al., 2021; Nguyen & Nguyen, 2023). Traditional machine learning techniques, like Support Vector Machines and Naïve Bayes, are frequently used in different sentiment analysis contexts (Le et al., 2025). Moreover, some machine-learning techniques combined with statistical methods can improve classification accuracy and provide actionable insights into the factors driving customer satisfaction, making them valuable tools for the hospitality industry. Deep learning has gained significant traction as a powerful alternative to traditional machine learning models. These advanced methods have delivered remarkable results, especially in Aspect-Based Sentiment Analysis (ABSA). Unlike traditional models, deep learning techniques are trained end-to-end, allowing them to automatically learn and extract meaningful features from large volumes of text data. Some studies used Long Short-Term Memory (LSTM) networks and selected some of the most widely used transformer-based models for sentiment classification, including BERT, DistilBERT, XLNet, and RoBERTa (Bigne et al., 2023; Cuesta-Valiño et al., 2025; Xu et al., 2025; Yang et al., 2025; Alqusair et al., 2025; Adiningtyas & Millanyani, 2024; Zhuang et al., 2025). This shows that a more nuanced and diverse range of review methods can provide a clearer picture of customer satisfaction and dissatisfaction. These findings emphasize the importance of considering various factors and methodologies, such as sentiment analysis, frequency analysis, and regression models, when assessing customer satisfaction in the hotel industry.

Most studies have employed various approaches to text mining. However, few studies have used lexical rules or examined how to combine aspects with SenticNet to improve results and reduce the complexity of the algorithms (Ahmad et al., 2025). Moreover, these studies lack a clear, overall process with step-by-step for solving the problem effectively. This highlights the need for further research to develop comprehensive, standardized methodologies for measuring customer satisfaction that integrate aspects and polarity words while considering the structure and length of customer reviews.

METHODOLOGY

1. Fundamentals of concepts

This study will use some definitions and notations Table 1. Below are definitions and notations. Some of them are extended from a study by Nguyen & Nguyen (2023), and others are developed on our own.

Definition 1. Reviews:

A review is the feedback of a customer when they share their experience on TripAdvisor. The set of reviews is expressed by:

$$R = \{r_1, r_2, \ldots, r_n\} \tag{1}$$

Definition 2. Customers:

The customers are a set of guests who have had experiences with Vietnamese hotels (Nguyen & Nguyen, 2023). A set of customers is expressed by (2):

$$G = \{g_1, g_2, \ldots, g_m\} \tag{2}$$

Definition 3. Aspect

Aspects are the set of attributes and services that are provided by hotels. They are created by extracting nouns from reviews and fit with the attributes of the hotel. For example, location, staff, room, and surroundings.

$$A = \{a_1, a_2, \ldots, a_l\} \tag{3}$$

With a_k is the aspect of the hotel.

Definition 4. Aspect groups

Aspect groups are sets of words that have the same meaning. Aspect groups are used to describe hotel attributes.

$$F = \{w_1, w_2, \ldots, w_s\} \tag{4}$$

Definition 5. Overall Satisfaction

Overall satisfaction is described by the feelings of guests g_j with hotel services. who wrote a review r_i (Nguyen & Nguyen, 2023) and it is expressed by the equation (5) below:

$$Sas_{overall} = \frac{\text{number of positive reviews}}{\text{total of reviews}} x100\% \tag{5}$$

Definition 6. Aspect Satisfaction

Customers are satisfied with each aspect of the service provided by the hotel and are denoted by $Sas(a_k)$ With a_k is the aspect of the hotel (Nguyen & Nguyen, 2023).

$$Sas(a_i) = \frac{\text{number of positive reviews that contain aspect } (a_i)}{\text{total of reviews that contain aspect } (a_i)} x100\% \tag{6}$$

Definition 7. Satisfaction level for hotel aspect:

The satisfaction level for the hotel aspect is scored on a scale of 1 to 5. For example: 1= very dissatisfied, 2= dissatisfied, 3= neutral, 4= satisfied, 5= very satisfied. This scale is determined by the degree of polarity of the polarity words.

$$Sas\_Scale = [1..5] \tag{7}$$

Definition 8. Polarity words:

Polarity words refer to adjectives or adverbs that express a positive or negative sentiment in language. These words play a crucial role in sentiment analysis, helping to determine whether a statement conveys a positive, negative, or neutral tone. Positive polarity words indicate approval, happiness, or praise. Examples include adjectives like excellent, beautiful, and delightful and adverbs like wonderfully, brilliantly, and happily. Negative polarity words convey disapproval, criticism, or negativity. Examples include adjectives like terrible, ugly, and disappointing and adverbs like poorly, badly, and unfortunately.

Definition 9. Levels of Sentiment Based on Polarity Words:

This study defined and divided the levels of sentiment into five levels:

- Level 5: Highly Positive: Contains multiple strong positive polarity words (e.g., fantastic, incredible, wonderful).

- Level 4: Moderately Positive: Has some positive words but with lower intensity (e.g., good, nice, pleasant).
- Level 3: Neutral: Lacks significant positive or negative polarity words.
- Level 2: Moderately Negative: Contains some mild negative words (e.g., bad, unsatisfactory, lacking).
- Level 1: Highly Negative: Has multiple strong negative words (e.g., horrible, disastrous, terrible).

The level of satisfaction in sentiment analysis is influenced by the intensity of descriptive words, particularly when modifiers like “very” accompany adjectives. These modifiers, known as gradable adjectives or adverbs, enhance the expression of sentiment. For instance, the word “good” conveys satisfaction, but adding “very” to form “very good” strengthens the positive sentiment, indicating a higher level of satisfaction. The same principle applies to other adjectives, where their intensity can be amplified by degree words, making the sentiment more pronounced. Besides, negation plays a crucial role in altering the meaning of polarity words. Negative words such as "not" or "no" reverse the intended sentiment of an adjective. For example, while “happy” expresses a positive sentiment, the phrase “not happy” weakens or even negates that positivity, shifting the meaning towards dissatisfaction or neutrality. Similarly, "not bad" can suggest a moderate level of positivity despite containing a negation.

The combination of large language models and Sentinet corpora has been demonstrated to be highly accurate in sentiment analysis problems at the deep semantic and lexical levels (Wu et al., 2023). The study by Nguyen (Nguyen & Nguyen 2024) did not explain how to calculate the value of the sentiment words. Therefore, in this study, we have chosen the solution of large language models combined with the Senticnet corpora to understand customer experiences in more detail. In this study, we rely on the sentiment dictionary (SenticNet) to calculate the sentiment of each review. This SenticNet dictionary already has adjectives and adverbs with their sentiment value. Based on the sentiment values, we used a formula to calculate values from 1-5, like a 1-5 star rating. Table 1 below shows a part of the sentiment dictionary with its sentiment value and rate. This SenticNet has 164 adjectives and 276 adverbs.

Table 1. Sentiment dictionary (Source: Authors’ data analysis)

Adjectives	Score	Rated	Adverbs	Score	Rated
good	1.9	4	well	1.1	4
great	3.1	5	fast	0.4	3
nice	1.8	4	straight	0.9	3
excellent	2.7	4	hard	-0.4	2
friendly	2.2	4	loudly	-1.3	2
clean	1.7	4	proudly	2.6	4
helpful	1.8	4	suspiciously	-1.7	2
comfortable	2.3	4	strangely	-1.2	2
best	3.2	5	kindly	2.2	4
beautiful	2.9	4	easily	1.4	4

Definition 10. Aspect substring:

Aspect substrings are smaller segments of the original text that contain specific aspects. These substrings are created through a structured process to ensure that relevant aspect-related information is extracted accurately. They are generated using specific rules, identifying aspects in a sentence, and determining their surrounding context. The extraction process considers factors like the presence of polarity words, sentence structure, and punctuation. The process to create substrings is shown in Figure 1. Below. This study takes a deeper and more detailed approach to measuring customer satisfaction compared to previous research. Our work involves three key tasks. First, we employ Python programming to assess overall customer satisfaction. Next, we apply linguistic rules to segment text into shorter substrings and group them by aspect.

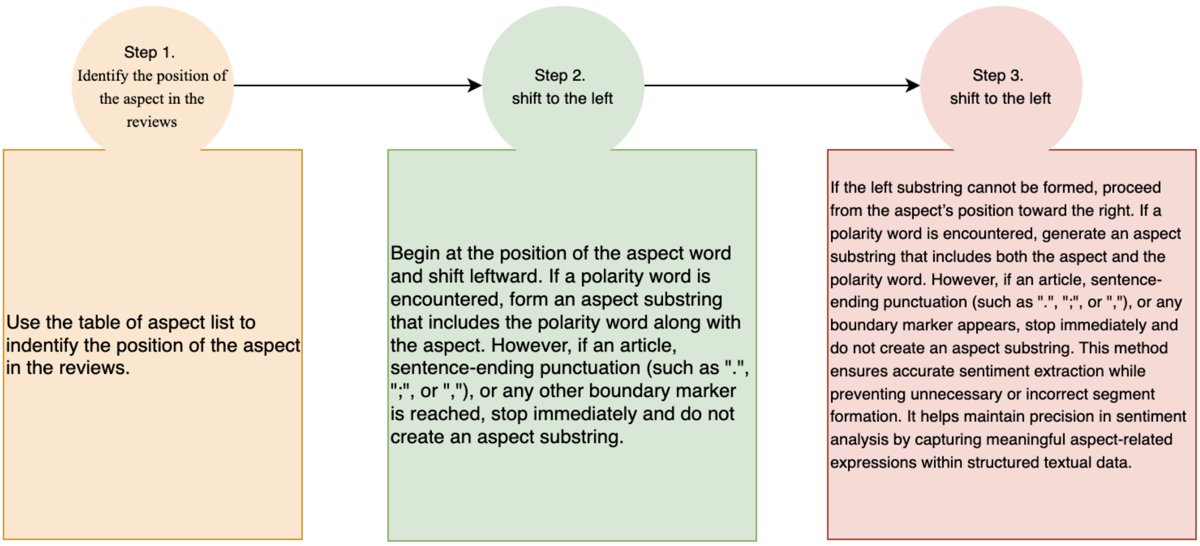

Figure 1. Three steps to create a substring from original reviews (Source: Authors’ data analysis)

This study analyzes satisfaction levels for each specific aspect, identifying aspects of dissatisfaction that may not be evident in overall satisfaction and rates satisfaction of aspects that have not been addressed in prior studies. Finally, this research compiles a list of common polarity words from the dataset, categorizing them into different satisfaction levels: very dissatisfied, dissatisfied, neutral, satisfied, and very satisfied. This classification enables a more precise measurement of satisfaction based on sentiment intensity. This approach, which combines linguistic rules with inferential statistics, introduces a new perspective in sentiment analysis, providing deeper insights into customer satisfaction beyond general ratings.

2. Measuring customer satisfaction with hotel services

The Python language provides a VADER library that can easily measure the sentiment score of reviews, which we have used to measure overall customer satisfaction with hotel services. Overall satisfaction shows the percentage of customers who are satisfied with the whole hotel services in Vietnam and it is calculated by the following formula (5).

3. Measuring customer satisfaction with hotel aspects

In a sentence expressing overall satisfaction, there may still be aspects of the service that the customer is dissatisfied with. The VADER library, however, is unable to analyze satisfaction levels for each individual hotel aspect. To address this, we applied linguistic rules to separate each service aspect into substrings and then used the VADER library to assess satisfaction for each aspect. For measuring satisfaction, we utilized a predefined set of hotel aspects. This approach allows for a more detailed analysis of customer feedback by evaluating satisfaction levels for specific elements of the hotel experience.

We follow a systematic process to analyze customer satisfaction with hotel services:

- Step 1: Identify aspects of the reviews

We begin by identifying key aspects mentioned in the customer reviews, such as "food," "room," "staff," "location," and "service." These are the focal points that are typically used to evaluate hotel experiences.

- Step 2: Create aspect substrings:

Once the aspects are identified, we create substrings for each aspect within the reviews. This allows us to isolate relevant information for further analysis.

- Step 3: Gather aspect substrings into aspect groups:

After creating the substrings, we organize them into specific aspect groups. These groups will help categorize feedback related to each hotel service area, facilitating more accurate analysis.

- Step 4: Use the VADER library to measure satisfaction:

Finally, we apply the VADER library, a sentiment analysis tool, to evaluate customer satisfaction with each aspect of the hotel service. The VADER library measures sentiment, allowing us to quantify satisfaction levels for each aspect identified in the previous steps. Measure the rate of customer satisfaction according to the service aspects extracted in the previous step, according to the formula (6).

4. Determining the satisfaction level with each hotel aspect

The level of customer satisfaction with each service aspect is measured on a scale from 1 to 5. To achieve this, we build upon the previous results and perform a pairing process between aspects and polarity words as outlined below:

- Step 1: Gather aspect substring groups:

We begin by collecting the groups of aspect substrings according to their respective aspects. This step ensures that each aspect is appropriately categorized.

- Step 2: Extract pairs of polarity words and aspects:

Next, we extract pairs of polarity words (positive or negative words) associated with each aspect. We also remove any unrelated or irrelevant words that may interfere with the analysis. Each word pair is then recorded along with its frequency of occurrence in the reviews.

- Step 3: Calculate the satisfaction score:

In this step, we use the frequency of polarity word pairs to calculate a satisfaction score for each aspect. The score is determined by a predefined formula that considers the occurrence and sentiment of the polarity words. Based on the calculated score, we then assign a satisfaction level (ranging from 1 to 5) to each aspect. Calculate the score and determine the satisfaction level of each aspect according to the formula that was proposed by the authors.

$$Level\_Sas\ (a_i) = \frac{1*\theta_1(a_i)+2*\theta_2(a_i)+3*\theta_3(a_i)+4*\theta_4(a_i)+5*\theta_5(a_i)}{n} \qquad (7)$$

In which: $Level\_Sas\ (a_i)$: Level of satisfaction with aspect a_i

$\theta_1, \theta_2, \theta_3, \theta_4, \theta_5$: The number of occurrences of polarity word and aspect pairs is equivalent to the score 1, 2, 3, 4, 5.

n: Total number of side-by-side occurrences of polarity word and aspect

RESULTS

1. Description of data

The research data was gathered from the TripAdvisor website, a trusted source for travel advice from actual travelers. It is regarded as the world's largest travel community, with over 60 million visits each month, 44 million registered members, and upwards of 100 million reviews contributed by genuine travelers. The site serves users in numerous countries, now operating in 49 markets and offering content in 28 distinct languages. We used the TripAdvisor crawler add-on function on Chrome to collect data on the TripAdvisor site. The data is collected from 1,438 hotels in Vietnam, ranked from 3 to 5 stars. The structure of a customer review includes the following key information:

Reviewer name, Review date, Free text review, customer ID, overall star rating, and rating by some aspect of hotel service. The total number of reviews is 32,447, and Figure 2 below shows the customer types when they booked hotels for the purpose: Business, Friends, Family, Couples, Solo, and None. This data showed clearly that Couples dominate, making up 40.5% of the total. Family groups also hold a significant portion at 23.3%. Solo at 6.3% and None at 12.7%. Business accounts for a much smaller share, only 3.3%. This is proven that couples care about their experiences when they stay in a hotel. Next, we store the data in .csv format. Then, we used Python to preprocess the data; after processing, it has 32,447 reviews. In which 5 stars: 23,158 reviews, 4 stars: 5,325 reviews, 3 stars: 2,110 reviews, 2 stars: 984 reviews, 1 star: 870 reviews. Figure 3 shows the distribution of star levels in this data. From a total of 32,447 reviews collected from 3-5 star hotels in Vietnam. The longest review is 20,362 words. The shortest is one word.

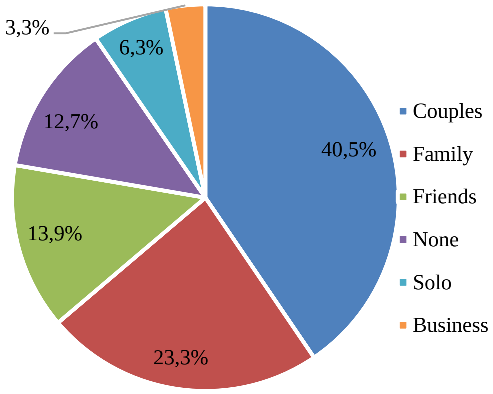

Figure 2. Distribution of customers who comment on TripAdvisor (Source: Authors' data analysis)

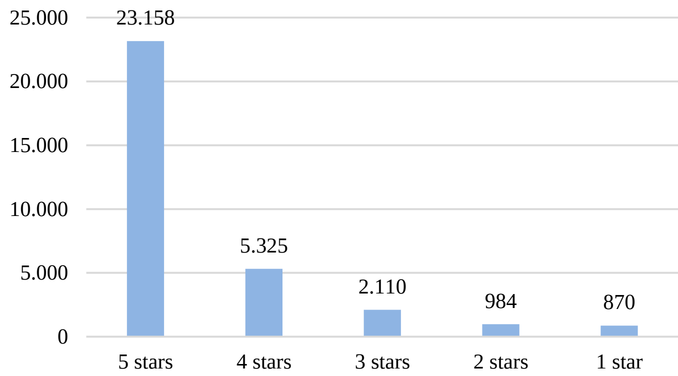

Figure 3. Description of data that were collected from the TripAdvisor site (Source: Authors' data analysis)

2. Measuring customer satisfaction with hotel services

This study utilized the VADER (Valence Aware Dictionary and Sentiment Reasoner) library, which is equipped with tools to assess sentiment scores in sentences. The library calculates scores that categorize sentiments into three distinct types: positive, negative, and neutral. Additionally, it computes a compound score, which aggregates these individual scores into a single value that provides an overall sentiment measurement. Based on the compound score, the sentiments were further classified into three categories: satisfied, dissatisfied, and neutral. The categorization helps to evaluate the general sentiment expressed in the reviews more clearly than the star rating Based on the compound score, we classify it into three categories: satisfied, dissatisfied, and neutral. The number of reviews for each class is 27,353 reviews for satisfaction, 2,985 reviews for dissatisfaction, and 2,110 reviews for neutral. Calculate the satisfaction and dissatisfaction rates of customers equivalent: satisfied: 84.3%, dissatisfied: 9.2% and 6.5% are not clearly expressed attitudes. The measurement results are shown in Figure 4.

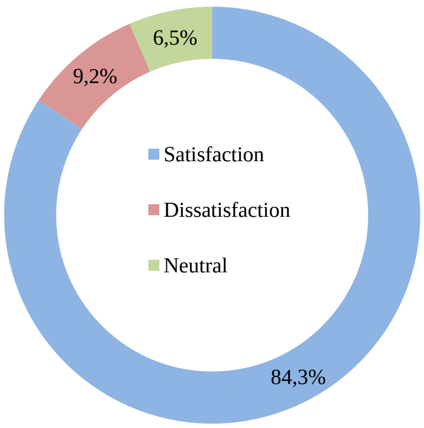

Figure 4. Satisfaction and dissatisfaction rates with 3-5 stars hotels in Vietnam (Source: Authors' data analysis)

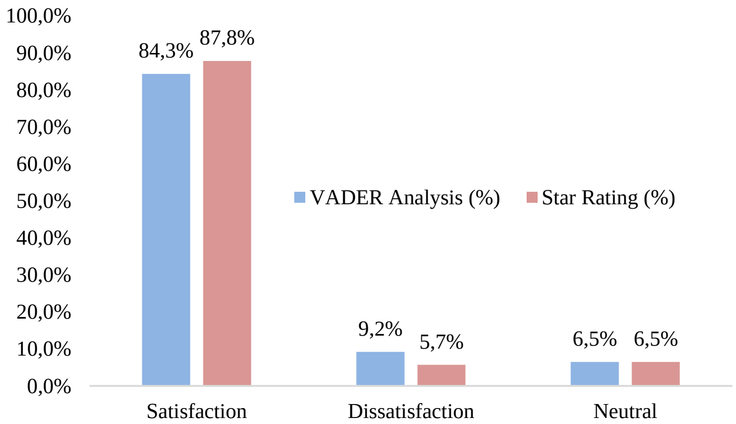

Figure 5. The comparison of customer satisfaction from their rating and from the result of the review analysis (Source: Authors' data analysis)

With a rate of 84.3% of customers satisfied with the 3-5 star hotels in Vietnam, it shows that the overall service quality of 3-5 star hotels has met the requirements of customers. Besides, the dissatisfaction score is 9.2%. So we need to consider carefully what points were not satisfactory.

Figure 5 illustrates a discrepancy between customer satisfaction as indicated by direct ratings and analysis derived from reviews. While 87.8% of customers express satisfaction with their experience, only 84.3% of the review-based analysis aligns with this satisfaction level, highlighting more complex or critical sentiments in written feedback. The rate of dissatisfaction stands at 5.7%, whereas the review analysis reports a greater dissatisfaction at 9.2%.

3. Measuring satisfaction of customer by service aspects

To genuinely grasp what elements of the hotel lead to customer dissatisfaction, we will conduct a detailed analysis of specific factors. Our initial step involves listing these hotel aspects and identifying the corresponding sentiment words for each. The aspect words highlighted in reviews will indicate their significance. Frequent mentions by customers suggest they hold those aspects in high regard, while infrequent mentions imply less concern. The Word Cloud chart in Figure 6 below illustrates the aspects referenced in this data. Figure 7 illustrates the frequency of each aspect that customers mentioned in; it helps highlight the relative importance of various aspects. The chart presents data on how often each aspect was referred to. The aspect of "room" stands out with the highest number of mentions, indicating that it is considered the most important factor by the customers. This emphasizes the value placed on the room experience, suggesting that it plays a crucial role in overall satisfaction. By analyzing these frequencies, we gain a clearer understanding of the priorities and preferences of those surveyed. We identified aspect substrings related to the room, staff, food, service, and location. Table 2 below shows the total count of these substrings derived from 32,447 reviews, demonstrating that each aspect of hotel service is addressed in all reviews. Some aspects may have been mentioned multiple times, resulting in a total count of extracted aspect substrings that exceeds the number of reviews collected.

Figure 6. Word Cloud for the review data (Source: Authors' data analysis)

Table 2. Number of aspect substrings for each aspect (Source: Authors' data analysis)

Aspect	# aspect substring
Food	10246
Room	29963
Staff	14251
location	6561
services	9793
Prices	2346
Facility	3235

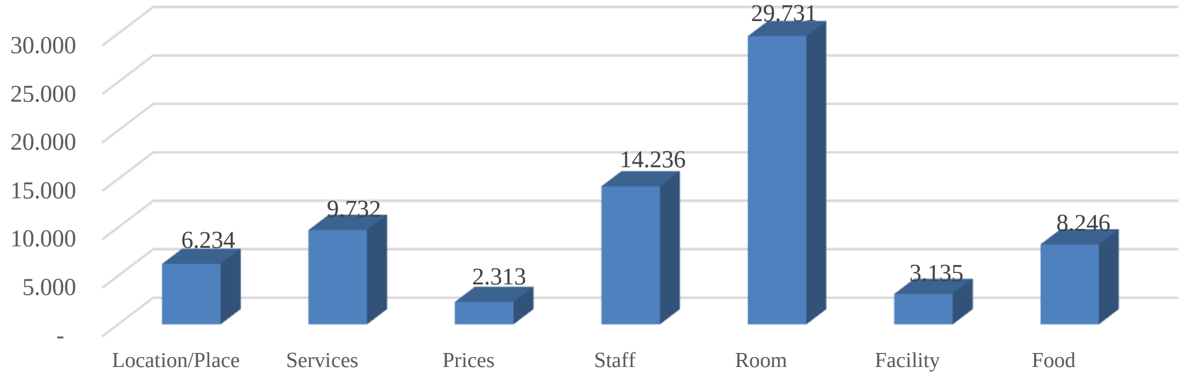

Figure 7. Mentions by Aspect (Source: Authors' data analysis)

Customer satisfaction is evaluated through aspect substrings using the VADER library. The satisfaction levels are categorized into satisfaction, dissatisfaction, and neutrality. Figure 8 below is the chart displaying satisfaction measurements based on various hotel aspects: services, location, staff, room, price, facility, and food.

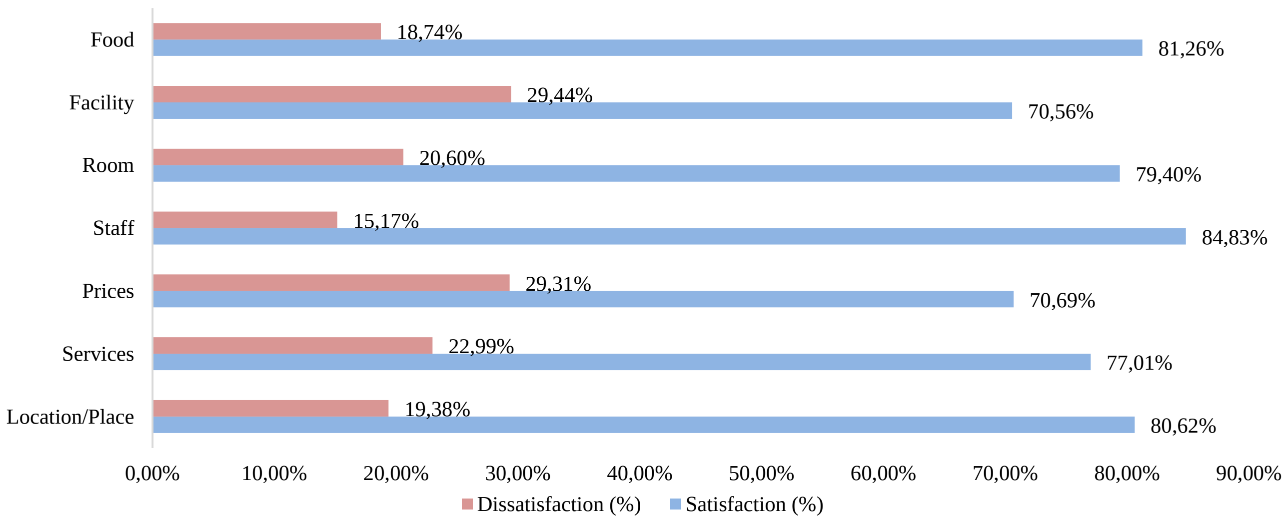

Figure 8. Measuring satisfaction for each aspect by calculating the aspect substring score

The chart presents customer satisfaction and dissatisfaction rates across several aspects of the hotel. The data reveals key insights into the areas where customers feel most satisfied and where improvements might be needed. The aspect "Staff" has the highest satisfaction rate of 84.83%, with a low dissatisfaction rate of 15.17%, reflecting positive customer feedback on the staff provided. For the aspect "Location/Place" the satisfaction rate is high at 80.62%, with a relatively low dissatisfaction rate of 19.38%, indicating that most customers are pleased with the hotel's location. While the aspect "room" with the highest mention, it only reaches 79.4% of satisfied customers. Regarding "prices", only 70.69% of customers were satisfied with the price of the hotel, and the frequency of mentions was the lowest. Which 29.31% are dissatisfied, suggesting that pricing could be a point of contention. The satisfaction rate with "services" is 77.01%, indicating that the hotels have to improve their services.

4. Measuring the satisfaction level with each hotel aspect

The aspect of "Room" generated the most mentions, representing a large part of the total feedback. This indicates that customer experiences related to the room are the most commonly addressed, suggesting that it significantly impacts overall satisfaction or dissatisfaction. The "Food" and "Staff" aspects also garnered substantial mentions, with "Staff" being the second most discussed area following Room, highlighting their importance to customers. On the other hand, the "Service" and "Location" aspects received moderate mentions, implying that while they are relevant, they are not as integral to the customer experience as staff and room quality. In contrast, the aspects of "Price" and "Facility" had very few mentions, suggesting these elements may play a less critical role in customer satisfaction than others. To calculate the rating for each aspect, this study followed two stages. First, we identified the corresponding sentiment words with each aspect and then used the sentiment dictionary to calculate the sentiment value of each aspect. Figure 9 shows the rating of each aspect. Despite the aspect "Room" was mentioned with the highest frequency. But the satisfaction is not the highest. The aspects "Staff" and "Food" have the highest ratings, 4.67 and 4.61, respectively. This indicates that when customers do mention the "staff", they are overwhelmingly positive when reacting to staff, and the dining experience is a strong point for the hotels. The "Price" aspect has a notably low rating of 2.63, which is significantly lower than all other aspects. This indicates a strong dissatisfaction with the pricing. The aspect "room" with a 4.46 score, has slightly lower ratings compared to other aspects like "Location".

Figure 9. Ratings by Aspect (Source: Authors' data analysis)

DISCUSSION AND CONCLUSION

In modern business administration, the customer-centric approach has become a crucial strategy. By prioritizing customer satisfaction, companies can foster customer loyalty, which ultimately drives revenue and profit growth (Luturlean & Anggadwita, 2016; Lee et al., 2020; Rahimian et al., 2021). As we live in an increasingly digital world, the hotel industry in Vietnam has integrated into the global value chain, leveraging online hotel service platforms.

This digital transformation has significantly altered how customers interact with hotel services, making their experiences more diverse, emotional, and complex (Hariandja & Vincent, 2022). In the highly competitive market, customer experience plays a crucial role in a business's success. The rise of online platforms means customers can easily share their experiences, whether positive or negative, influencing the decisions of future customers. A single poor experience can lead to a customer seeking services from a competitor, which underscores the importance of maintaining a consistently high-quality experience. Hotels and businesses must recognize that customers are not just purchasing a service; they are investing in an experience, one that is shaped by emotional connections and technological advancements.

Therefore, hotel managers not only focus on improving physical services but also enhance their online presence and digital interfaces, ensuring that the entire customer journey—both online and offline—is seamless and satisfying. The customer-centric approach requires continuous adaptation to emerging technologies and customer needs, making it vital for companies to stay ahead of the curve in order to retain and grow their customer base (Hu et al., 2019).

This study presents data analysis techniques employing text mining to assess customer satisfaction with hotel services in Vietnam. Customer satisfaction is evaluated through three stages: (1) overall satisfaction with hotel services, (2) satisfaction with particular hotel features, and (3) satisfaction levels regarding individual hotel aspects. By combining text mining with sophisticated language analysis, this approach offers deeper insights into customer preferences and facilitates the development of a more comprehensive customer persona. The satisfaction results show that 84.3% of customers are satisfied with hotel services in Vietnam. Yet, a deeper analysis of the language uncovers some unsatisfactory elements in the general feedback. The highest satisfaction is associated with the "staff" factor, which received over 84.83% satisfaction. This aligns with previous studies, where the "staff" aspect consistently received higher ratings.

While previous research has primarily focused on measuring customer satisfaction, few studies have examined the satisfaction levels associated with specific aspects of hotel services. This study adds to the field by introducing this new dimension, thereby providing a more nuanced understanding of customer satisfaction. Furthermore, this study presents a method for rating these aspects from 1 to 5 stars. This approach can be further explored in future research, enabling a broader application of text-mining techniques to evaluate customer satisfaction across various industries and regions.

Author Contributions: Conceptualization, Q.D.P., L.P.N. and H.T.T.N.; methodology, Q.D.P., L.P.N. and H.T.T.N.; software, H.T.T.N. and P.D.Q.; validation, P.D.Q., L.P.N. and H.T.T.N.; formal analysis, L.P.N. and H.T.T.N.; investigation, P.D.Q., L.P.N. and H.T.T.N.; data curation, P.D.Q. and L.P.N.; writing - original draft preparation, Q.D.P., L.P.N. and H.T.T.N.; writing - review and editing, Q.D.P.; visualization, L.P.N. and H.T.T.N.; supervision, P.D.Q. and L.P.N.; project administration, P.D.Q. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Adiningtyas, H., & Millanyani, H. (2024). Analysis of Customer Satisfaction Levels in Five-Star Hotels Based on Online Customer Reviews. In *2024 2nd International Conference on Software Engineering and Information Technology (ICoSEIT)*, 167-174, IEEE. https://doi.org/ 10.1109/ICoSEIT60086.2024.10497518

Ahmad, W., Khan, H. U., Alarfaj, F. K., & Alreshoodi, M. (2025). Aspect-based sentiment analysis: A comprehensive review and open research challenges. *IEEE Access: Practical Innovations, Open Solutions*, *13*, 65138–65182. https://doi.org/10.1109/access.2025.3555744

Alhassan, F. (2025). Online Travel Agent (OTA) and Customer Experience in the Hospitality Sector. In *Digital Transformation in the Customer Experience*, 375–394, Apple Academic Press. https://doi.org/10.1201/9781003560449.

Alqusair, D., Taileb, M., & Hassanin Al-Barhamtoshy, A. (2025). A survey of deep learning techniques for Arabic aspect-based sentiment analysis. *IEEE Access: Practical Innovations, Open Solutions*, 13, 25350–25368. https://doi.org/10.1109/access.2025.3539263

Altun, Ö., Saydam, M. B., & Gunay, T. (2025). Unraveling customer experiences in chain coffee shops through online reviews. *British Food Journal (Croydon, England)*, 127(6), 1895–1909. https://doi.org/10.1108/bfj-11-2024-1160

Amoako, G. K., Doe, J. K., & Neequaye, E. K. (2023). Online innovation and repurchase intentions in hotels: the mediating effect of customer experience. *International Hospitality Review*, 37(1), 28–47. https://doi.org/10.1108/ihr-02-2021-0008

Baek, J., Choe, Y., & Ok, C. M. (2020). Determinants of hotel guests' service experiences: an examination of differences between lifestyle and traditional hotels. *Journal of Hospitality Marketing & Management*, 29(1), 88–105. https://doi.org/10.1080/19368623.2019.1580173

Barzizza, E., Biasetton, N., Disegna, M., & Salmaso, L. (2025). Combining textual and rating data from online reviews to cluster consumers. Communications in Statistics. *Case Studies, Data Analysis and Applications*, 11(2), 204–231. https://doi.org/10. 1080/23737484.2025.2481300

Bigne, E., Ruiz, C., Perez-Cabañero, C., & Cuenca, A. (2023). Are customer star ratings and sentiments aligned? A deep learning study of the customer service experience in tourism destinations. *Service Business*, 17, 281–314. https://doi.org/10.1007/s11628-023-00524-0

Chalupa, S., & Petricek, M. (2024). Understanding customer's online booking intentions using hotel big data analysis. *Journal of vacation marketing*, 30(1), 110-122. https://doi.org/10.1177/13567667221122107

Chittiprolu, V., Samala, N., & Bellamkonda, R. S. (2021). Heritage hotels and customer experience: a text mining analysis of online reviews. *International Journal of Culture Tourism and Hospitality Research*, *15*(2), 131–156. https://doi.org/10.1108/ijcthr-02-2020-0050

Cho, S., Pekgün, P., Janakiraman, R., & Wang, J. (2024). The competitive effects of online reviews on hotel demand. *Journal of Marketing*, 88(2), 40–60. https://doi.org/10.1177/00222429231191449

Cuesta-Valiño, P., Butkouskaya, V., Muravsky, D., & Kazakov, S. (2025). Improving guest satisfaction by identifying hotel service micro-elements failures through Deep Learning of online reviews. *Management Letters/Cuadernos de Gestión*, 25(1). https://doi.org/ 10.5295/cdg.242191sk

Davoodi, L., Mezei, J., & Heikkilä, M. (2025). Aspect-based sentiment classification of user reviews to understand customer satisfaction of e-commerce platforms. *Electronic Commerce Research*. https://doi.org/10.1007/s10660-025-09948-4

Derco, J., & Tometzová, D. (2025). Customer satisfaction through online reviews analysis–a case study of Slovak spas. *Worldwide Hospitality and Tourism Themes*. https://doi.org/10.1108/WHATT-01-2025-0017

Garner, B., & Kim, D. (2022). Analyzing user-generated content to improve customer satisfaction at local wine tourism destinations: an analysis of Yelp and TripAdvisor reviews. *Consumer Behavior in Tourism and Hospitality*, 17(4), 413–435. https://doi.org/10.1108/cbth-03-2022-0077

Glaveli, N., Manolitzas, P., Palamas, S., Grigoroudis, E., & Zopounidis, C. (2023). Developing effective strategic decision-making in the areas of hotel quality management and customer satisfaction from online ratings. *Current Issues in Tourism*, 26(6), 1003–1021. https://doi.org/10.1080/13683500.2022.2048805

Guttentag, D. A., Mahdikhani, M., Starr, C., & Starr, E. (2025). How Airbnb guest experiences differ by accommodation type: a lexicon-based sentiment analysis of Airbnb reviews. *Tourism Recreation Research*, 1-15. https://doi.org/10.1080/02508281.2025.2449627

Hariandja, E. S., & Vincent, F. (2022). Linking customer experience, satisfaction, and loyalty to brand power and performance in international hotels. *Innovative marketing*, *18*(3), 59-71. https:// 10.21511/im.18(3).2022.06

Hutto, C., & Gilbert, E. (2014). Vader: A parsimonious rule-based model for sentiment analysis of social media text. In *Proceedings of the international AAAI conference on web and social media*, 8(1), 216-225. https://doi.org/10.1609/icwsm.v8i1.14550

Islam, M. N. (2025). Visitors' sentiment in archeological heritage sites: A study based on TripAdvisor reviews. *International Journal of Hospitality & Tourism Administration*, 26(1), 90-111. https://doi.org/10.1080/15256480.2023.2242343

Kalnaovakul, K., Balasubramanian, K., & Chuah, S. H.-W. (2025). Service quality, customer sentiment and online ratings of beach hotels: an analysis of moderating factors. *Journal of Hospitality and Tourism Insights*, 8(3), 988–1009. https://doi.org/10.1108/jhti-06-2024-0591

Khorsand, R., Rafiee, M., & Kayvanfar, V. (2020). Insights into TripAdvisor's online reviews: The case of Tehran's hotels. *Tourism Management Perspectives*, 34(100673), 100673. https://doi.org/10.1016/j.tmp.2020.100673

Le, H. T. M., Phan-Thi, T.-A., Nguyen, B. T., & Nguyen, T. Q. (2025). Mining online hotel reviews using big data and machine learning: An empirical study from an emerging country. *Annals of Tourism Research Empirical Insights*, 6(1), 100170. https://doi.org/10.1016/j.annale.2025.100170

Lee, H. S. K., Wang, J., Moreno-Brito, Y. L., Shen, Y., & Kim, H.-S. (2024). Linguistic insights into customer satisfaction: an exploratory analysis of online reviews for gaming destination resorts in Las Vegas. *Journal of Hospitality and Tourism Technology*. https://doi.org/10.1108/jhtt-05-2023-0147

Li, H., Liu, Y., Tan, C. W., & Hu, F. (2020). Comprehending customer satisfaction with hotels: Data analysis of consumer-generated reviews. *International Journal of Contemporary Hospitality Management*, 32(5), 1713-1735. https://doi.org/10.1108/IJCHM-06-2019-0581

Luturlean, B. S., & Anggadwita, G. (2016, March). A framework for conceptualizing customer experiences management in the hotel industry. In *3rd International seminar and conference on learning organization*, 132-136, Atlantis Press. https://doi.org/ 10.2991/isclo-15.2016.25

Mensah, E. A., Odame, D. N. A., Ankrah, I., Obuobisa-Darko, T., & Hinson, R. E. (2025). From reviews to reflections: Understanding tourist sentiments and satisfaction in African destinations through user-generated content. *Annals of Tourism Research Empirical Insights*, 6(1), 100174. https://doi.org/10.1016/j.annale.2025.100174

Moreno Brito, Y. L., Ban, H. J., & Kim, H. S. (2024). Ecological hotels' customer satisfaction through text mining of online reviews: a case of Ecuador hotels. *Journal of Hospitality and Tourism Insights*, 7(3), 1532–1552. https://doi.org/10.1108/jhti-09-2022-0467

Nguyen, H. T. T., & Nguyen, T. X. (2023). Understanding customer experience with Vietnamese hotels by analyzing online reviews. *Humanities & Social Sciences Communications*, 10(1). https://doi.org/10.1057/s41599-023-02098-8

Nguyen, V. H., & Ho, T. (2023). Analysing online customer experience in hotel sector using dynamic topic modeling and net promoter score. *Journal of Hospitality and Tourism Technology*, 14(2), 258-277.

Nguyen, V.-H., Nguyen, N., Nguyen, T.-H., Nguyen, Y.-N., Dinh, M.-T., & Doan, D. (2025). Customer emotion detection and analytics in hotel and tourism services using multi-label classificational models based on ensemble learning. *Annals of Operations Research*. https://doi.org/10.1007/s10479-024-06434-2

Okpa, U. J., Okoro, L. A., Arrey, M. E. V., Mbum, P. A., Umo, U. A., Ina H, G. M., & Iwara, E. E. (2025). Role of social media as a catalyst for sustainable tourism development in Calabar Metropolis, Nigeria. *Geojournal of Tourism and Geosites*, *58*(1), 412-421. Https://doi.org/ 10.30892/gtg.58138-1423

Olorunsola, V. O., Saydam, M. B., Lasisi, T. T., & Eluwole, K. K. (2023). Customer experience management in capsule hotels: a content analysis of guest online review. *Journal of Hospitality and Tourism Insights*. https://doi.org/10.1108/jhti-03-2022-0113

Özen, İ. A., & Özgül Katlav, E. (2023). Aspect-based sentiment analysis on online customer reviews: a case study of technology-supported hotels. *Journal of Hospitality and Tourism Technology*. https://doi.org/10.1108/jhtt-12-2020-0319

Park, E., Kang, J., Choi, D., & Han, J. (2020). Understanding customers' hotel revisiting behaviour: a sentiment analysis of online feedback reviews. *Current Issues in Tourism*, 23(5), 605–611. https://doi.org/10.1080/13683500.2018.1549025

Peco-Torres, F., Polo-Peña, A. I., & Frías-Jamilena, D. M. (2025). How to enhance online reputation? An empirical study from a joint customer–firm perspective. *Journal of Vacation Marketing*, 31(1), 67-82. https://doi.org/10.1108/JHTT-04-2021-0116

Permatasari, W., Maghrifani, D., & Wibowo, A. (2025). A qualitative exploration of guest satisfaction with budget hotels from online review: the case of Indonesia. *Cogent Business & Management*, 12(1). https://doi.org/10.1080/23311975.2025.2475987

Rahimian, S., ShamiZanjani, M., Manian, A., & Esfidani, M. R. (2021). A framework of customer experience management for hotel industry. *International Journal of Contemporary Hospitality Management*, 33(5), 1413–1436. https://doi.org/10.1108/ijchm-06-2020-0522

Sadiasa, C. M. R., Le, A. V., & Moussa, M. (2025). Examining the Experiences of Visitors—Dark Tourism at the Old Melbourne Gaol: Reviews from TripAdvisor. In *The Palgrave Handbook of Breakthrough Technologies in Contemporary Organisations*, 285-304, Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-96-2516-1_23

Shi, J., Chen, J., Wu, J., & Liu, Y. (2025). Evaluating cruise user satisfaction through online reviews: a method based on sentiment analysis and large-scale group decision-making. *Applied Intelligence*, 55(6), 418. https://doi.org/10.1007/s10489-025-06241-7

Tango, H., Yee, C. L., Ho, J. A., & Chen, Y. (2024). Intervening Role Of Tourists ' Engagement In User-Generated Content On Their Pro-Environmental Behaviours: A Perspective Of Virtual Goffman's Theory. *Geojournal of Tourism and Geosites*, *57*, 2005-2019. https://doi.org/10.30892/gtg.574spl15-1368

Thuy, V. T. N., Ho Thi My, L., Truong, T. H. M., & Phung, T.-B. (2024). Tourism destination management model in the transitional economy. In *Emerging and Evolving Business and Management Issues in Vietnam*, 159–192, World Scientific. https://doi.org/10.1142/13673

Veloso, M., & Gomez-Suarez, M. (2023). Customer experience in the hotel industry: a systematic literature review and research agenda. *International Journal of Contemporary Hospitality Management*, 35(8), 3006–3028. https://doi.org/10.1108/ijchm-04-2022-0517

Xu, W., Yao, Z., Ma, Y., & Li, Z. (2025). Understanding customer complaints from negative online hotel reviews: A BERT-based deep learning approach. *International Journal of Hospitality Management*, 126(104057), 104057. https://doi.org/10.1016/j.ijhm.2024.104057

Yang, S., Liao, H., & Kóczy, L. T. (2024). Preference mining and fuzzy inference for hotel selection based on aspect-based sentiment analysis from user-generated content. *Journal of the Operational Research Society*, 1-18. https://doi.org/10.1080/01605682.2024.2437128

Yang, Sigeon, Li, Q., Jang, D., & Kim, J. (2024). Deep learning mechanism and big data in hospitality and tourism: Developing personalized restaurant recommendation model to customer decision-making. *International Journal of Hospitality Management*, 121(103803), 103803. https://doi.org/10.1016/j.ijhm.2024.103803

Zarezadeh, Z. Z., Rastegar, R., & Xiang, Z. (2022). Big data analytics and hotel guest experience: a critical analysis of the literature. International *Journal of Contemporary Hospitality Management*, 34(6), 2320–2336. https://doi.org/10.1108/ijchm-10-2021-1293

Zhao, Z., Cheng, M., Lv, K., & Huang, L. (2025). What matters most? A sustainable or a conventional hotel experience? The interaction effect on guest satisfaction: A mixed-methods approach. *International Journal of Hospitality Management*, 124(103988), 103988. https://doi.org/10.1016/j.ijhm.2024.103988

Zheng, X., Huang, J., Wu, J., Sun, S., & Wang, S. (2023). Emerging trends in online reviews research in hospitality and tourism: A scientometric update (2000− 2020). *Tourism Management Perspectives*, 47, 101105. https://doi.org/10.1016/j.tmp.2023.101105

Zhuang, Q., Chu, Z., & Li, J. (2025). Text Analysis of Digital Commentary on Ice and Snow Tourism Based on Artificial Intelligence and Long Short-Term Memory Neural Network. *IEEE Access*. https://doi.org/ 10.1109/ACCESS.2025.3548125

General Statistics Office of Vietnam, https://www.gso.gov.vn/

Article history: Received: 04.03.2025 Revised: 27.05.2025 Accepted: 19.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1302-1314
DOI 10.30892/gtg.602spl26-1502

DIGITALIZATION AND TOURISM: HOW X, Y, AND Z GENERATIONS MAKE TRAVEL DECISIONS IN THE ONLINE ERA

Zsuzsanna IVANCSÓNÉ HORVÁTH [1*], Marcell KUPI [2], Viktória KUNDI [3]

[1] Széchenyi University of Győr, Kautz Gyula Faculty of Economics, Department of Tourism and Catering, Győr, Hungary; ivancso.zsuzsa@sze.hu (Z.I.H.);
[2] Institute for Regional Studies West Hungarian Research Department, Hungarian Research Network Centre for Economic and Regional Studies, Győr, Hungary, e-mail: kupi.marcell@krtk.hun-ren.hu; Széchenyi University of Győr, Kautz Gyula Faculty of Economics, Department of Tourism and Catering, Győr, Hungary; kupi.marcell@sze.hu (M.K.)
[3] Széchenyi University of Győr, Kautz Gyula Faculty of Economics, Department of Tourism and Catering, Győr, Hungary; kundi.viktoria@ga.sze.hu (V.K.)

Citation: Ivancsóné Horváth, Zs., Kupi, M., & Kundi, V. (2025). Digitalization and tourism: How X, Y, and Z generations make travel decisions in the online era. *Geojournal of Tourism and Geosites*, 60(2spl), 1302–1314. https://doi.org/10.30892/gtg.602spl26-1502

Abstract: This study aims to explore the impact of digitalisation on the travel decision-making process of Generation X, Y, and Z, as well as to identify generational differences in tourism consumer behaviour. The research places particular emphasis on the role of information sources and variations in decision-making preferences. The study employs a quantitative research approach, analysing the travel decision-making habits of different generations through survey-based data collection. A literature review was conducted to examine intergenerational differences and the relationship between digitalisation and travel-related decision-making. Results and discussions: The findings indicate that digitalisation influences travel decisions across all generations, albeit in different ways. Trust and personal recommendations play a crucial role for Generation X, whereas Generation Y relies more heavily on online reviews. In the case of Generation Z, social media and digital channels have a decisive influence. The study also highlights that price remains a key factor for all generations; however, expectations regarding quality and information-seeking behaviours differ. Generation Y and Z exhibit a higher demand for visual content and real-time information, while Generation X tends to value reliability and detailed planning. Furthermore, the results show a clear trend toward mobile-first decision-making among younger users, especially within Generation Z. The study's findings contribute to the development of tourism marketing strategies by enabling the more effective application of generation-specific communication tools. Based on the results, recommendations can be made for tourism service providers regarding the optimisation of their digital presence and customer communication. The insights gained can also support designing personalised digital campaigns, enhance customer engagement, and foster loyalty among different generational segments in the evolving digital tourism landscape.

Keywords: digitalisation, generational differences, tourism consumer behaviour, impact of social media, travel decision-making, dtc, tourism marketing

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INTRODUCTION

Tourism has undergone significant transformations over the past decades, largely influenced by the advancement of digitalisation and the increasing generational differences in consumer behaviour. The integration of digitalisation into everyday life has reshaped the way individuals plan, search for, and make travel decisions, with online platforms and digital content becoming dominant sources of information (Orabi, 2022; Panoiu & Foris, 2024; Mamengko et al., 2024; Bilan et al., 2024; Kantar, 2025). Simultaneously, the distinct preferences of different generations have become key factors for stakeholders in the tourism industry. This study aims to explicitly examine how digitalisation influences travel decision-making processes across three generations—X, Y, and Z—by identifying key generational differences in the use of digital information sources. The research seeks to determine the extent to which each generation relies on digital versus interpersonal sources when making travel-related decisions. Research on consumer behaviour has demonstrated that generational differences manifest not only in information processing but also in decision-making and value orientation (McCrindle & Wolfinger, 2010; Törőcsik, 2011; Orabi, 2022). Younger generations have grown up using digital technologies from birth, while older age groups have gradually adapted to these tools. This divergence significantly influences the extent to which different generations rely on various information sources when making travel-related decisions. To achieve this, the following research questions were formulated:

1. How does digitalisation influence the travel decision-making of Generation X, Y, and Z?
2. What generational differences can be observed in tourism consumer behaviour among Generation X, Y, and Z in terms of the factors influencing travel decisions?

The hypotheses tested in this research, formulated based on the literature review, are as follows:

- **H1:** Generation Y and Z rely more heavily on digital information sources when making travel decisions compared to Generation X.

* Corresponding author

- **H2:** The older generation (Generation X) is more influenced by personal recommendations (friends and family), whereas younger generations (Generation Y and Z) are more influenced by online reviews.

This study contributes to the fields of tourism marketing and consumer behaviour research by providing a detailed insight into the digital behaviour of different generations. The findings offer practical implications for tourism service providers aiming to develop generation-specific marketing strategies and optimise their digital presence.

The research is based on an empirical study utilising survey-based data collection to support the proposed hypotheses. The analysis of the collected data enables an in-depth understanding of the extent and manner in which each generation uses digital tools in their travel decision-making processes.

LITERATURE REVIEW

Generations

Tourists' consumer behaviour is influenced by numerous factors, some of which are demographic, such as age, gender, education level, and income. Age can be a determining factor in decision-making, as each generation has unique expectations, experiences, lifestyles, values, and demographic characteristics that shape their purchasing habits (Williams & Page, 2011; Orabi, 2022). According to Törőcsik (2016), generations are linked by shared experiences, life events, and ultimately, common values. Even if these connections are not strong, they remain significant. Values create an opportunity to connect decisions across a generational framework, reinforcing the idea that differences exist between generations while also highlighting the internal similarities that influence decision-making among members of the same generation (Törőcsik, 2011; Törőcsik, 2014; Törőcsik, 2016, in: trendinspiracio.hu/generacios-kutatas/ 2016; Orabi, 2022).

McCrindle & Wolfinger (2010) suggest that generations are to sociologists what artefacts are to archaeologists, as they provide a clear picture of the values and lifestyles of people born within the same time interval in a given nation. This is because they have lived through the same era and have been shaped by the same societal influences (Ivancsóné Horváth et al., 2017; Varadzhakova & Naydenov, 2024; Orabi, 2022). Danyi et al. (2020) also highlight in their study that generational differences serve as a fundamental approach to examining tourism consumer behaviour and segmenting consumer groups. The application of generational attributes in consumer behaviour research is widely recognised in academic literature (Danyi et al., 2020; Aina & Ezeuduji, 2021; Kökény & Jászberényi, 2022; Orabi, 2022). For the classification of generations, this study adopts the age group definitions established by Törőcsik (2011) (Table 1). Additionally, Table 1 includes the Beta Generation, which consists of individuals born after 1 January 2025 (https://www.vg.hu/vilaggazdasag-magyar-gazdasag/2023/07/hetvegere-a-felgyorsulo-vilagban-nonek-a-generacios-kulonbsegek). In international literature, there is no complete consensus regarding the exact birth years of each generation; however, a variance of one or two years in age classification is generally acceptable for research purposes (Farkas et al., 1995, in: Zsarnóczky, 2018).

Table 1. Definition of each generation based on Törőcsik (2011) Source: Own editing (Törőcsik, 2011; https://www.vg.hu/vilaggazdasag-magyar-gazdasag/2023/07/hetvegere-a-felgyorsulo-vilagban-nonek-a-generacios-kulonbsegek)

Generations	Date of birth	Age (in 2025)
Silent generation	1925-1945	80-100
Baby boomers	1946-1964	61-79
Generation X	1965-1979	44-60
Generation Y	1980-1994	31-45
Generation Z	1995-2009	16-30
Alpha	2010-2024	1-15
Beta	2025-2039	

The naming conventions for generations are not uniform across different authors. In this study, we adopt the classifications used by Törőcsik (2011). According to this categorisation, the following generational groups can be distinguished: the Silent Generation (born between 1925 and 1945), the Baby Boomers (1946–1964), Generation X (1965–1979), Generation Y (1980–1994), Generation Z (1995–2009), and the youngest group, Generation Alpha (born after 2010). The Beta Generation, comprising individuals born after 1 January 2025, is still too young to be meaningfully included in academic research.

Generational differences manifest in various aspects, including:

- Adaptability to sudden changes,
- General attitudes towards life situations and the surrounding environment,
- Approach to lifelong learning and further education,
- Career-building based on personal preferences,
- Leisure activities and recreational habits,
- Development of cultural and social behaviours influenced by financial status,
- Effective use of social media for different purposes,
- Perspectives on the world of work and professional life (Zsarnóczky, 2018),
- Acceptance and use of new technologies.

For the purposes of this study, the latter—the acceptance and use of digital technology—is of primary importance.

Digitalisation exerts a significant influence across all aspects of life, including tourism, where it affects both the accessibility of information and the decision-making processes on both the supply and demand sides (Happ & Ivancsó, 2018; Happ et al., 2020). Generational differences in the acceptance and use of digital technology play a crucial role in shaping tourism-related consumer behaviour and segmentation strategies (Kupi et al., 2023). In order to examine how different generations interact with digitalisation, it is essential to first understand their key characteristics.

Members of the Silent Generation grew up in an era shaped by war and economic crises, where adaptability was crucial for success. Their values are strongly influenced by the importance of close family ties and adherence to traditional family roles (Zsarnóczky, 2018). Many members of this generation spent their entire careers with a single employer and within a single profession. They tend to avoid digital tools whenever possible, often feeling unfamiliar or uncomfortable with them.

Born in a period of post-war demographic expansion, Baby Boomers experienced intense competition throughout their lives, shaped by political and economic transformations, including mass unemployment and economic instability (Zsarnóczky, 2018). While they generally prefer traditional travel agencies and printed travel guides, an increasing number of Baby Boomers use the internet for information gathering and booking purposes. They tend to favour social media platforms such as Facebook and YouTube, particularly for video-based content. Simplicity and reliability are key factors in their use of digital technologies (Becker Digital, 2023). Members of Generation X were often raised in dual-income households, which fostered a strong sense of independence and adaptability (Zsarnóczky, 2018). Frequently referred to as the "latchkey generation" (Kissné, 2014), they developed high levels of self-reliance from an early age. This is the first generation that was exposed to computers in their youth, though their use was not as widespread as it is today. Over time, their adaptability has allowed them to effectively integrate technological advancements into their daily lives (Zsarnóczky, 2018).

In terms of tourism, Generation X frequently uses email and the internet to plan and book travel. While they appreciate the convenience of digital tools, security and reliability remain key concerns. They actively seek discounts and special deals online and tend to conduct thorough research before making travel-related decisions (Becker Digital, 2023).

Generation Y is highly receptive to technological innovations and seeks to differentiate itself from previous generations by pursuing a fast-paced lifestyle (Zsarnóczky, 2018). They spend a significant portion of their lives online but still value real-life social experiences (Becker Digital, 2023). Known as "digital natives," Generation Z members have been immersed in digital technologies since childhood (Zsarnóczky, 2018). They manage most aspects of their lives online, leveraging digital tools for social interactions, information-seeking, and transactions. Generation Z travellers are more likely to trust peer-generated content and online reviews than traditional advertisements (Orabi, 2022). For Generation Z, the quality of digital interaction is as important as the quality of the physical service itself, especially in hospitality contexts (Yamagishi et al., 2024). Moreover, Generation Z travellers are increasingly influenced by immersive technologies, such as virtual reality, which enhance their travel inspiration and decision-making processes (Assiouras et al., 2024).

Additionally, the integration of the metaverse into tourism experiences offers Generation Z personalized and engaging interactions, aligning with their expectations for innovative and interactive digital environments (Buhalis et al., 2023) They tend to form stronger bonds with friends and classmates rather than with their home cities or towns (Tóth-Kaszás, 2018). In education and learning environments, they prefer visual and interactive formats. Multitasking is a defining trait of this generation, as they frequently use multiple digital devices simultaneously. The Alpha Generation is the first to have never known life without the internet. They are adept at using multiple technological devices simultaneously and can integrate different perspectives in problem-solving. The Walt Disney Company EMEA identified this cohort as "Generation XD" in a pan-European study, describing them as the tech-savvy children of Generation X. Their key trait is multitasking, allowing them to navigate various digital platforms seamlessly while engaging with others (Zsarnóczky, 2018).

Members of Generation Alpha are fully aware of the risks associated with artificial intelligence and other virtual processes. The Disney study also revealed that while they are entirely comfortable with technology, they prefer using it for social connections rather than replacing face-to-face interactions. Despite their digital fluency, in-person meetings remain their preferred form of social engagement (30%), followed by text messaging (15%), online chat (14%), and mobile calls (8%) (https://archive.nytimes.com/schott.blogs.nytimes.com/2010/01/19/generation-xd/).

Digitalisation

Digitalisation has become a cornerstone of the modern travel industry, enabling instant access to tailored information and services, especially valued by younger generations (Bilan et al., 2024). In today's world, the significance and presence of the digital sphere continue to expand, driven by an increasing demand for information and the widespread availability of digital content across multiple platforms (Varga, 2023a; Varga, 2023b; Vu et al., 2025). A new concept has emerged—digital literacy—which is commonly defined as the ability to use digital technology, communication tools, and networks to locate, evaluate, utilise, and create information (Martzoukou & Elliott, 2016; Issakov et al., 2023; Bilan et al., 2024).

For younger generations, particularly those belonging to Generation Z and Alpha, the use of digital tools is second nature, and they engage with new technologies with remarkable proficiency (Garai-Fodor & Csiszárik-Kocsir, 2018; Garai-Fodor, 2020; Berényi & Csiszárik-Kocsir, 2023; Rudež, 2023). In contrast, earlier generations, such as Generation X and Y, were introduced to digital literacy through formal learning, as they experienced a world without digital technologies. This distinction may explain why they tend to exhibit greater scepticism and caution towards online content compared to younger generations. For Generation Z and Alpha, digital tools offer both advantages and drawbacks. They increasingly rely on online reviews and user-generated content as trusted sources when making travel decisions (Orabi, 2022).

These tools are not only a means of communication and information gathering, but also integral components of smart tourism environments that increasingly shape travel experiences and consumer expectations (Buhalis & Amaranggana, 2014; Rudež, 2023; Ivancsóné Horváth et al., 2025). While their ability to acquire information almost instantly is a significant benefit, it also means that a substantial portion of their lives is spent in the online or "virtual" sphere, which may present challenges in maintaining a balanced interaction with the physical world (Rudež, 2023; Csiszárik-Kocsir, 2024). Although generational differences in digital tool usage and travel decision-making are clearly outlined according to the literature, it is important to note that generational categories do not always accurately reflect individual behaviours.

Another limitation lies in the fact that research on the impact of digitalisation often overlooks cultural, economic, and regional variations, all of which significantly influence technology adoption and consumer choices.

MATERIALS AND METHODS

The study was conducted using an online survey, which participants could complete in a digital environment. As a result, a basic level of digital proficiency was required to access and fill out the questionnaire. A key limitation of this methodology stems from potential biases associated with online surveys, such as unequal internet access among certain population groups. Additionally, voluntary participation may have introduced selection bias, as respondents who chose to complete the survey might have a stronger interest in travel than the general population.

The survey was anonymous and voluntary, and it remained open for responses between 1 March and 30 April 2024. There was no obligation to share or redistribute the questionnaire, and its distribution relied on volunteers. Although the dataset is large, it is not fully representative. The questionnaire successfully reached all generational groups (shown in Table 2.); however, Generation Z was overrepresented, while Baby Boomers and Generation Alpha were underrepresented. Consequently, the study primarily focuses on Generations X, Y, and Z.

Table 2. Distribution of the generations in the sample, source: own source

Generation	n
X-generation	112
Y-generation	154
Z-generation	410

The questionnaire utilised closed-ended questions and Likert scales to gather responses. During the evaluation process, numerical recoding was performed where necessary, and all analyses were conducted using numerical scales (nominal, ordinal, interval, and ratio). In rare cases where the overrepresentation of Generation Z could have distorted the sample, weighting adjustments were applied to ensure interpretability. The following steps were undertaken to ensure data integrity:

- Initial data inspection identified missing values and invalid responses.
- Handling missing values:
  - For numerical data, missing values were replaced with the median or mean of the responses for that particular question.
  - For categorical data, missing values were substituted with the most frequent response.
- Exclusion of incomplete responses: Any responses where missing data exceeded 30% were removed to minimise potential bias.
- Consistency and logical checks: The dataset was reviewed to ensure internal consistency, and any contradictory responses were identified and either corrected or excluded.
- Removal of duplicate responses to eliminate bias from multiple submissions.
- Validation of data reliability included anomaly detection and extreme value identification to ensure the dataset's accuracy.

The dataset was analysed using JMP PRO 17 statistical software and Excel for data management.

The study adhered to ethical guidelines and data protection regulations. Participants took part in the research voluntarily and anonymously, and all collected data was handled confidentially in accordance with relevant privacy policies.

The primary objective of the research was to conduct a foundational study on generational differences, providing an overview of respondents' behaviours and preferences through a generational breakdown.

Application of Decision Trees in Modelling Travel Decisions

Decision trees serve as an effective tool for analysing the travel-related decision-making processes of different generations. These models allow researchers to explore the preferences and influencing factors that shape generational differences in tourism behaviour. A recent study by Mamengko et al. (2024) applied decision tree analysis to examine how Baby Boomers, Generation X, Y, and Z make tourist destination decisions based on cultural, social, personal, psychological, and marketing factors. The findings revealed significant differences across generations, highlighting the importance of tailored marketing strategies for each group. Similarly, a study by Yılmaz (2024) utilized decision trees to model destination choice priorities among Generations X, Y, and Z. The analysis identified distinct factors influencing each generation's destination selection, providing valuable insights for destination marketing organizations.

Decision trees are machine learning algorithms that represent decision-making processes in a hierarchical structure. These tools are particularly useful for understanding complex decision mechanisms and uncovering relationships between various influencing variables. A relevant study by Tang et al. (2015) applied a decision tree approach to model the dynamic behavioural process of travel mode shifts. Their research used decision trees to identify rules and factors influencing travellers' decisions when switching from one mode of transport to another. While this study did not specifically focus on generational differences, the methodology can be adapted to examine travel decisions across different generations.

For example, Wang & Wang (2022) utilised gradient boosting decision trees to compare car usage habits between Millennials and Generation X in the United States. Their findings highlighted significant generational differences in car usage patterns and the varying importance of influencing factors. The application of decision trees provides researchers with deeper insights into the travel decision-making processes of different generations. Although the number of specific publications in this area remains limited, existing studies demonstrate the methodology's adaptability and relevance. As a result, decision trees are considered a promising analytical tool for further research in this field.

RESULTS AND DISCUSSION

Generation X

An attitude assessment was conducted among the respondents, requiring them to answer questions related to their impressions and underlying motivations. Responses were recorded on a five-point interval scale. Since the attitudes of frequent travellers differ from those who travel less often and may not have established platform preferences, travel frequency was recoded into two categories: "relatively rarely" and "relatively frequently" when mapping the decision-making sequence. In the DTC analysis, which can be interpreted as a form of decision tree construction, both categories were included in the study. Travel frequency was thus expressed on a nominal scale to understand the preferences and perspectives of both those who travel relatively rarely and those who travel relatively frequently. Therefore, this question served as the starting point for the DTC analysis, while attitude-related statements remained within interval dimensions.

Before examining the DTC, it is important to determine the significance of the individual statements. In this respect, it becomes evident that: Price comparison: For Generation X, comparing prices is a fundamental factor. This indicates that they are conscious consumers who focus on cost optimisation and make decisions only after carefully comparing prices.

The high level of price sensitivity suggests that this group actively seeks the best deals and discounts, reflecting their financial awareness and focus on cost efficiency.

- **The role of price in service selection:** Price, as the most important factor, indicates that travel costs are one of the most decisive elements for Generation X. Their price sensitivity influences their decision-making process. Cost efficiency and financial planning are key considerations when choosing a travel service. This suggests that service providers must offer competitive prices to appeal to them, as they are likely to compare prices across providers before making a decision.
- **A well-designed website increases trust in travel services:** The design and professionalism of websites play a significant role in building trust. Generation X respondents highly value well-structured, user-friendly websites. Digital presence and online visibility are therefore crucial, and service providers must ensure that their websites are professional, informative, and easy to navigate in order to enhance customer trust and booking intent.

However, these are not the only influencing factors. Among the **less significant factors**, the following can be noted:

- **The impact of social media:** Social media advertisements have some effect on travel decisions but are not a dominant factor. In fact, they rank at the lower end of preference lists. For Generation X, such advertisements are likely to serve as supplementary sources of information rather than primary influences. While social media ads are present and may play a role in decision-making, Generation X tends to prefer other sources, such as **detailed information and personal recommendations**. As a result, online advertising serves a **supportive rather than leading** role in their decision process.
- **Scepticism towards first impressions:** Generation X often exhibits **scepticism regarding first impressions**, particularly when they come from advertisements or superficial information. This suggests that many in this generation feel that first impressions do not always reflect reality. It also indicates that they conduct thorough research to avoid **misleading first impressions and potential disappointment**. This implies a need for **deeper and more credible** sources of information in their decision-making process.
- **Low trust in influencers:** The recommendations of influencers and opinion leaders are considered **less credible** by Generation X compared to traditional advertisements. The low average score in this category suggests that Generation X respondents prefer to rely on other **trusted sources**. Many do not necessarily trust influencers or even engage with their content; instead, they depend on **their own research and reliable information sources** when making travel decisions.

The significance of pricing is also evident in the decision-making sequence. When an X-generation respondent enters the decision-making process, the first question they face is whether they are willing to pay more for higher-quality services. This question has the highest primary splitting capacity in the main branch ($G2 = 88.20$) ($n = 112$). If the answer is no, the decision tree becomes fragmented, and other unmeasured factors influence a small proportion of the sample ($n = 13$).

However, if the respondent answers yes ($n = 91$), meaning they are willing to pay more for better quality, the next attitudinal level considers whether they are influenced by social media advertisements. A significant portion of the sample ($n = 78$) is receptive to this influence, meaning that once the quality and corresponding price have been determined, they actively engage with social media, allowing themselves to be influenced by its promotions and offers.

If, at this point, price does not remain a primary decision factor (< 4) ($n = 25$), a branching occurs, where users make decisions based on website impressions. If we continue along the main branch and price remains an important consideration (> 4) ($n = 53$) ($G2 = 41.37$), price comparison follows. This question generates another branch where a small portion of the sample ($n = 12$) does not prioritise price comparison but instead makes decisions based on quality. In this case, the sample becomes fragmented, and this branch runs out. Returning to the main branch, it becomes evident that a significant portion of the sample ($n = 41$) considers user reviews and ratings a key factor, with relatively high explanatory power ($G2 = 26.21$). This stage represents the final decision point in the main branch; beyond this, the sample fragments, and travel decisions are made based on a few individual preferences. This DTC model also has a secondary branch, which focuses on those who do not consider "higher price for higher service" a decisive factor (< 3) ($n = 21$). For them, first impressions become the dominant factor, which carries relatively low risk but is strongly influenced by a well-designed website.

The analysis reveals that the primary driving forces behind Generation X's travel decisions are the balance between price and quality, the influence of social media, and user reviews and ratings. Well-designed websites and first impressions also play a significant role, especially among those who are not willing to pay more for higher-quality services. These factors collectively shape their destination choices and booking behaviours.

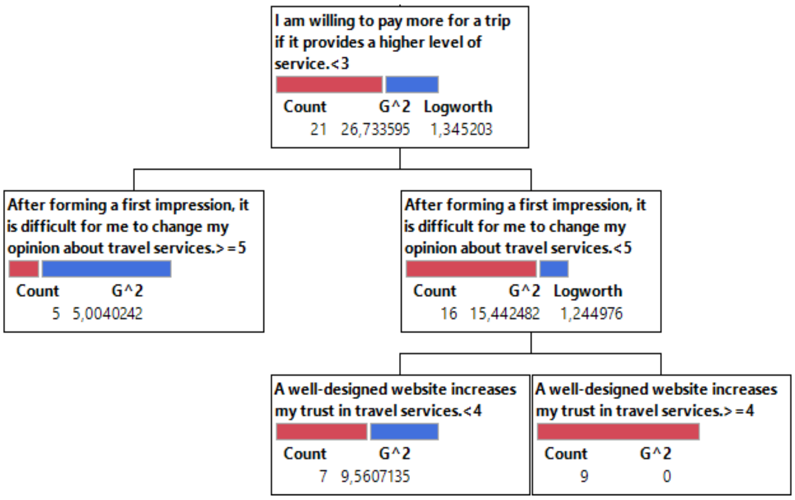

Figure 1/a. The real decision situation: decision tree (DTC) for Generation X fillers, way 1. source: own analysis output

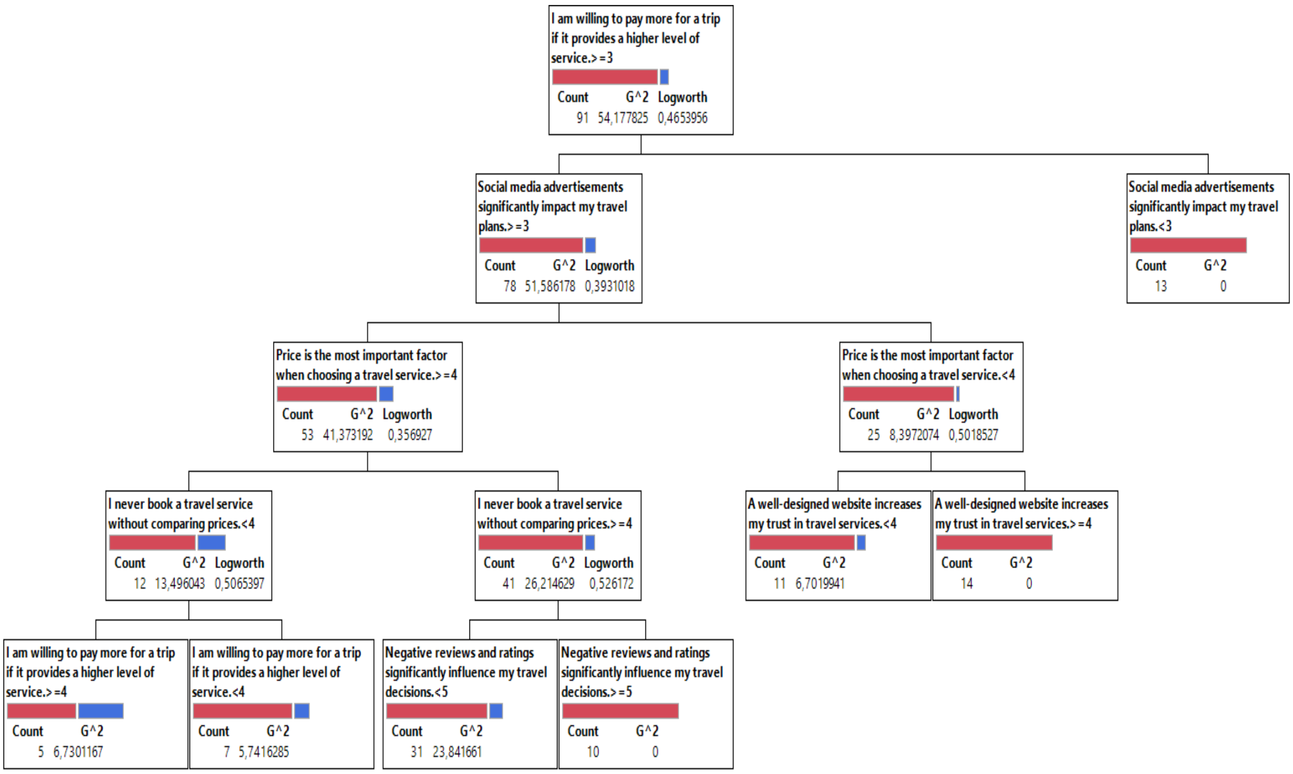

Figure 1/b. The real decision situation: decision tree (DTC) for Generation X fillers, way 2. (Source: own analysis output)

During the decision tree analysis (Figure 1/a and Figure 1/b), impressions and quality frequently emerged as key factors. One of the most influential elements shaping these perceptions is hotel branding, which is communicated through various aspects such as websites, staff uniforms, building facades, and other visual elements. Examining these components in detail (on a scale of 1–5), it becomes clear that for Generation X respondents, the following factors are particularly significant:

- I usually check online photos of accommodations:
  - Viewing images of accommodations online is of high importance for Generation X.
  - The high average score ($\bar{x} = 4.61$) and low standard deviation ($\sigma = 0.75$) suggest that this is one of the most defining factors for them, making it a clearly positive variable in the analysis.
  - Visual content, such as photos, plays a critical role in their decision-making process.
  - Hotels should ensure that they publish high-quality, appealing images online to attract potential guests.
- I can recall the colour scheme of a hotel later on:
  - Generation X respondents often remember a hotel's colour scheme.
  - The average score ($\bar{x} = 3.79$) and relatively higher standard deviation ($\sigma = 1.19$) indicate that while this factor is relevant, there are individual differences in how it is perceived.

- A hotel's colour scheme and interior design can leave a lasting impression on guests.
- This finding suggests that hotels should pay attention to interior aesthetics and overall visual appeal.

- The appearance of a hotel's website influences my choice of accommodation:
  - A strong online presence is essential for hotels.
  - A well-designed, user-friendly website enhances trust and facilitates customer decision-making.

Additional findings indicate that background music in hotels and staff uniforms are still part of guests' expectations and brand perception. However, hotel logos are less memorable to respondents.

Generation Y

An attitude assessment was conducted among Generation Y respondents, requiring them to answer questions related to perceptions and underlying motivations. Responses were recorded on a five-point interval scale. This was examined both independently and through a DTC analysis, where travel frequency was also recoded into "relatively rarely" and "relatively frequently" categories to map out decision-making patterns. Before analysing the DTC, the statements were evaluated, revealing that the following factors are particularly important for Generation Y:

- Price sensitivity:
  - For Generation Y, price is the most important factor when selecting travel services.
  - Travel providers must offer competitive pricing and communicate value-for-money propositions effectively.
  - Discounts, package deals, and promotions can increase interest among price-sensitive travellers.
  - Interestingly, unlike Generation X, who tend to compare prices first, Generation Y appears to set a reservation price first based on the responses. They then operate within this limit, considering other aspects once their price threshold has been defined.
- Demand for quality:
  - Generation Y is willing to pay more for higher-quality services.
  - The average score ($\bar{x} = 3.82$) and relatively high standard deviation ($\sigma = 1.21$) indicate that while many appreciate quality, there are individual differences in willingness to pay more.
  - Travel service providers should emphasise premium offerings, unique experiences, and luxury services, which can be attractive to quality-conscious travellers.
- Impact of user reviews:
  - Generation Y places significant emphasis on negative reviews and ratings, considering them more influential than Generation X does.
  - Travel service providers must proactively manage negative feedback, respond quickly and efficiently, and minimise potential negative effects.
  - Encouraging positive reviews and providing high-quality customer service can increase consumer trust, based on the survey results.

For the Generation Y sample, deal sensitivity is a less important factor. Members of Generation Y do not frequently change their travel plans based on promotions and discounts. An additional notable factor is that Generation Y finds influencers and opinion leaders less credible than traditional advertisements. Therefore, travel service providers should carefully handle the involvement of influencers in their marketing strategies. Selecting authentic and relevant influencers can enhance campaign effectiveness, but it does not replace traditional, reliable marketing methods. All of this reflects Generation Y's increased awareness and critical thinking. Generation Y's travel decisions are significantly influenced by pricing, demand for high-quality services, and user reviews. Price sensitivity and cost comparison are key factors, while negative reviews have a significant impact on decision-making. Well-designed websites and professional online appearances increase trust and booking willingness. Travel service providers must offer competitive prices, high-quality services, and reliable user reviews to appeal to Generation Y. Promotions and discounts provide flexibility, while the credibility of influencers shows mixed effects. Therefore, while involving credible influencers may be beneficial, traditional marketing methods remain important. The importance of statements assessed in isolation increases at multiple points when decision-making situations are involved. The starting point of the DTC analysis is the most decisive classification factor, focusing on whether the professionalism of a hotel or travel service provider's website directly influences the booking willingness of Generation Y respondents. Among the respondents, 34 people strongly agreed with this statement (value >= 5), while 120 respondents did not consider it to be such a significant factor (value < 5). Among those who believe that the professionalism of the website influences booking willingness, the next question examined was: "Are the recommendations of opinion leaders and influencers considered more credible than traditional advertisements?"

- 20 respondents agreed (value >= 3).
- Within this group, those who found influencer recommendations credible were further filtered by asking: "Do they frequently change their travel plans based on travel offers and discounts?"
  - 14 respondents often change their travel plans based on offers and discounts (value >= 3).
  - 6 respondents do not frequently alter their plans due to discounts and promotions (value < 3).

This reveals an impulsive segment within the sample, explaining the relatively higher variance in the independent assessment of these factors. Among those for whom professionalism is an influencing factor, but influencer recommendations are not considered more credible (value < 3), 14 respondents were identified. However, further segmentation is not possible due to sample fragmentation, and for them, the decision-making process concludes at this point.

On the other branch of the decision tree, that is, the main branch, all those who do not consider website professionalism to influence their booking willingness face the next decision point:

- Are they willing to pay more for a trip if it provides a higher level of service?
  - For most respondents, the decision is made at the point of finding the right price-value balance.
  - 46 respondents are not willing to pay more (value < 4).
  - Within this group, the next decision factor is whether they prioritize the opinions of friends and family over online reviews when making travel decisions.
    - 26 respondents consider friends' and family's opinions more important (value >= 4).
    - 20 respondents do not prioritize friends' and family's opinions (value < 4), logically leading them to rely on online reviews.
    - For 16 respondents, negative reviews have a significant impact (value >= 4).

The decision tree (Figure 2/a; Figure 2/b.) indicates that website professionalism significantly impacts booking willingness. Those who find it important are more likely to trust influencer recommendations and adjust their travel plans based on promotions and discounts. For those who consider professionalism less relevant, service quality and personal recommendations from acquaintances play a larger role. Negative reviews and ratings also have a significant impact on this group's decisions.

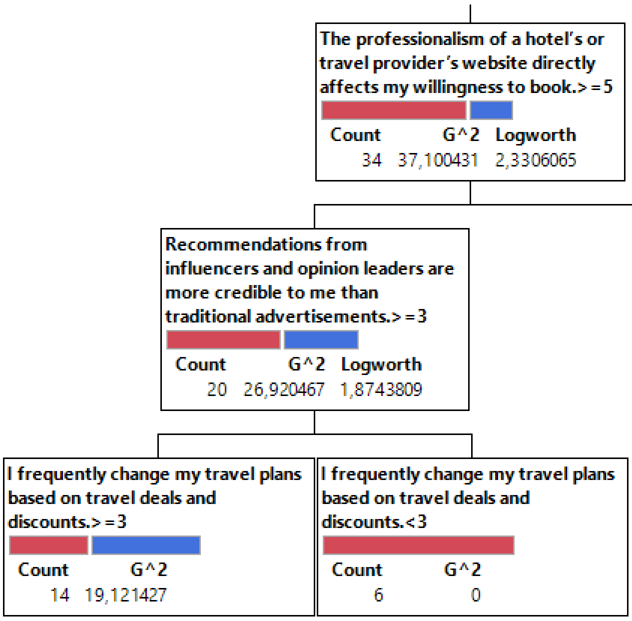

Figure 2/a The real decision situation: decision tree (DTC) for Generation Y fillers, way 1. (Source: own analysis output)

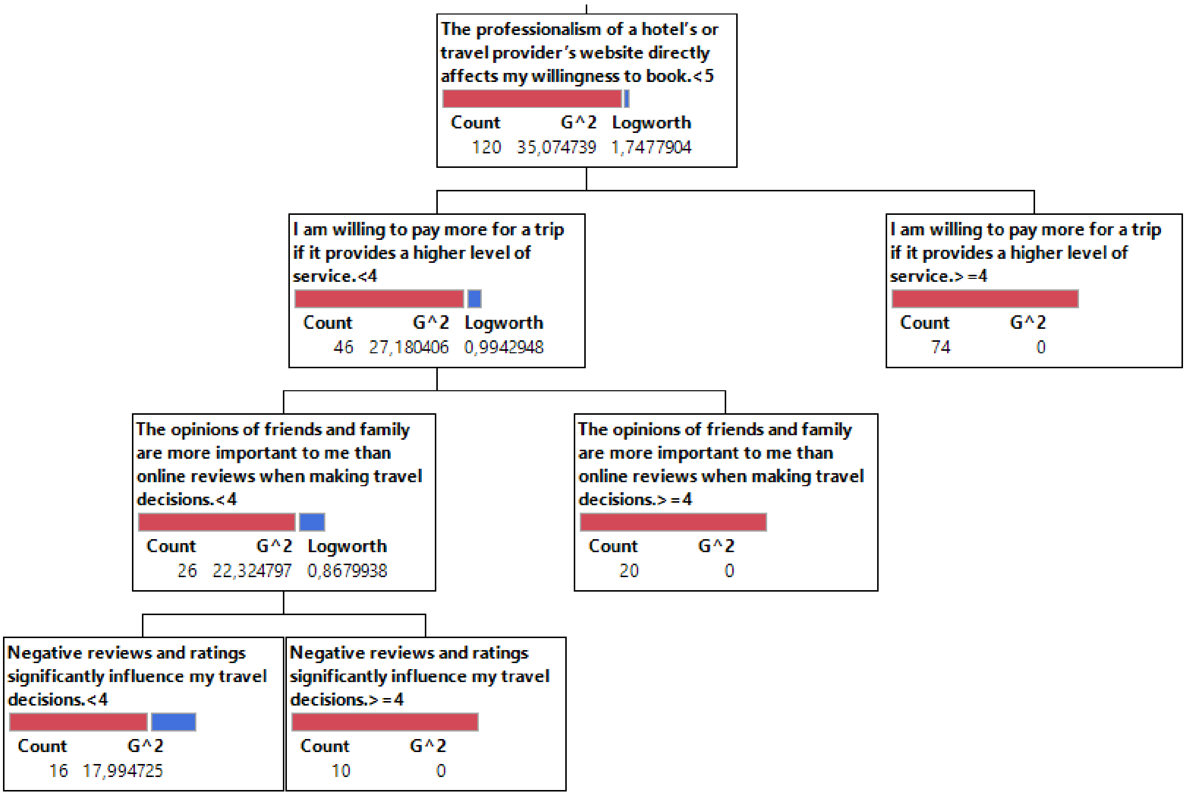

Figure 2/b . The real decision situation: decision tree (DTC) for Generation Y fillers, way 2. (Source: own analysis output)

Generation Z

For the Generation Z sample, an attitude analysis was also conducted, in which respondents had to answer questions aimed at mapping underlying motivations and impressions. Responses were recorded using a 5-point interval scale, which was examined independently as well as through DTC analysis. During the decision sequence mapping, travel frequency was recoded into "relatively rarely" and "relatively frequently" categories. Before analyzing the decision tree, examining the statements reveals that the following factors are considered important:

- Price sensitivity and price comparison:
  - For Generation Z, price comparison is the most important factor when selecting travel services, similar to Generation X.
  - As a result, travel service providers must offer competitive pricing and clearly communicate price-value ratios.
- The importance of digital presence:
  - For Generation Z, a well-designed website increases trust in travel services.
  - The results indicate that professional and user-friendly websites are crucial in building trust.
  - Travel service providers must place great emphasis on website design and usability.
  - As this was also an important factor for Generation X, modern, intuitive, and mobile-friendly websites can increase both booking willingness and consumer trust.
- Price sensitivity:
  - Price remains a key consideration for Generation Z when selecting travel services.

Generation Z members do not frequently change their travel plans based on offers and discounts; in fact, they are skeptical about first impressions and believe that these do not always reflect reality. The mean value ($\overline{x}$ = 3.28) and the relatively high standard deviation (σ = 1.01) indicate that while skepticism is present, there are individual differences in its extent. Travel service providers need credible and transparent communication, which is further supported by the fact that, contrary to common beliefs, Generation Z holds mixed opinions about influencer recommendations. Although the mean value is low, the standard deviation is relatively high (σ = 1.17), meaning that the impact of influencers is not uniform - many do not consider them more credible than traditional advertisements, but this is not a general rule.

Generation Z's travel decisions (Figure 3/a; Figure 3/b; Figure 3/c.) are strongly influenced by prices and price comparisons, well-designed websites, and user reviews. Price sensitivity and price comparisons are critical in decision-making, while negative reviews have a significant impact on trust. Well-designed and professional websites increase booking willingness and confidence. The importance of individual statements changes in real decision-making situations. The starting point of the DTC is social media. Among respondents, only 23 people firmly disagreed with the power of social media, and they tend to make travel decisions based on offers or recommendations from external parties.

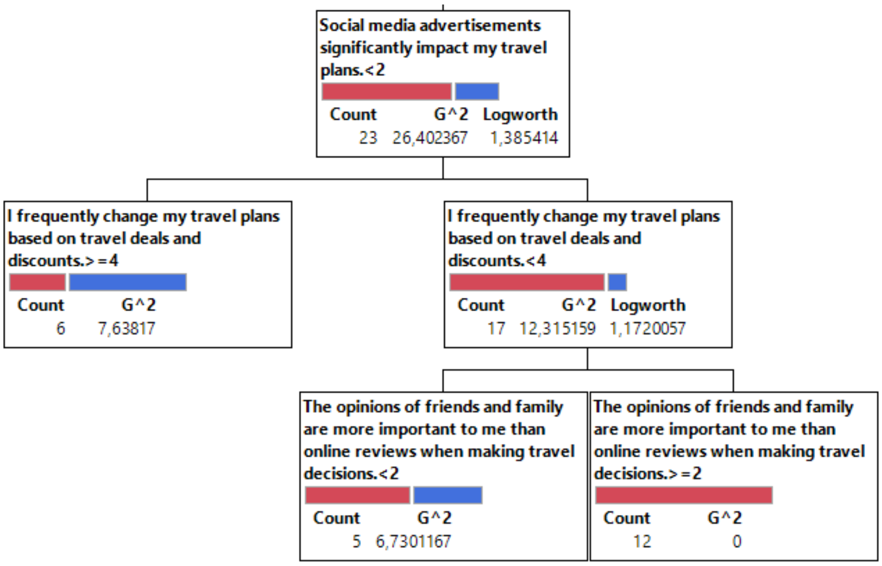

Figure 3/a . The real decision situation: decision tree (DTC) for Generation Z fillers, way 1 (Source: own analysis output)

However, the main branch clearly shows that the influence of social media is dominant (G2 = 157.45) (n = 387), after which the role of impressions becomes more significant, splitting the sample into two groups. The sub-branch clearly indicates that the factor of first impressions creates a loop - their role is uncertain but still an existing phenomenon, which can only be overridden by others' opinions. After that, impressions regain their primary role. This means that a significant portion of Generation Z makes emotional, impulse-based decisions, and social media is capable of triggering this demand.

Continuing along the main branch, another loop can be observed: the decision influenced by discounts and offers repeatedly resurfaces. Uncertainty is a fundamental characteristic of Generation Z, which is visibly confirmed at this stage as well - the unclear meanings and the influence of external factors reinforce this uncertainty even in travel-related decisions. The issue of price only appears at the fifth level of the DTC, despite the fact that, when evaluated independently, this factor was considered primary. Those who are satisfied with the price at this stage still require further confirmation, as the same factor reappears at the sixth level of the DTC, meaning they reassess the issue of price once again. Following this, 82 individuals still require final validation through online reviews before making a decision. Thus, it is evident that first impressions have a significant impact on their opinions, and they frequently modify their plans based on offers and discounts, where price remains a crucial factor. Those who are influenced by social media advertisements tend to adjust their plans frequently in response to offers, and the opinions of friends and family are also important considerations for them.

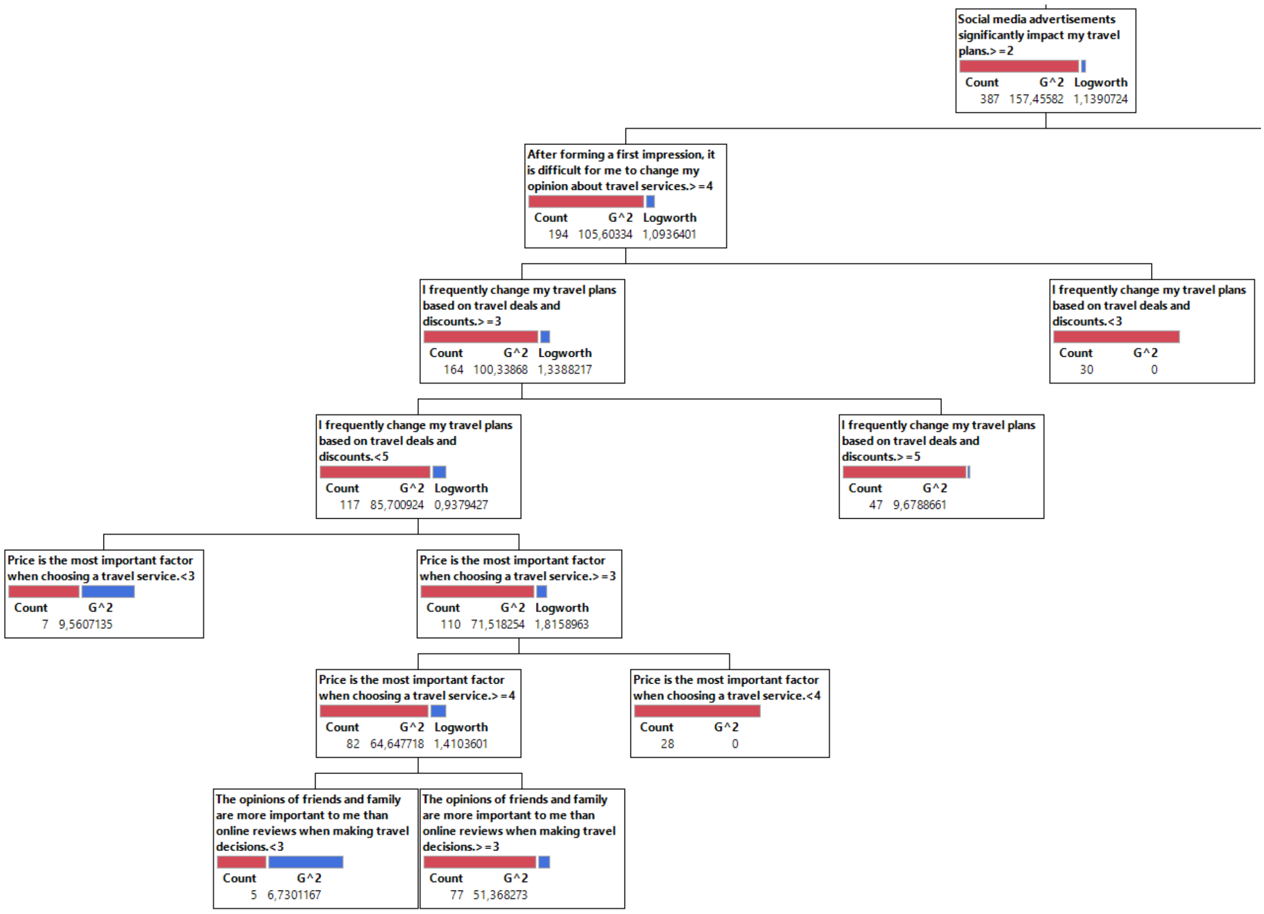

Figure 3/b. The real decision situation: decision tree (DTC) for Generation Z fillers, way 2 (Source: own analysis output)

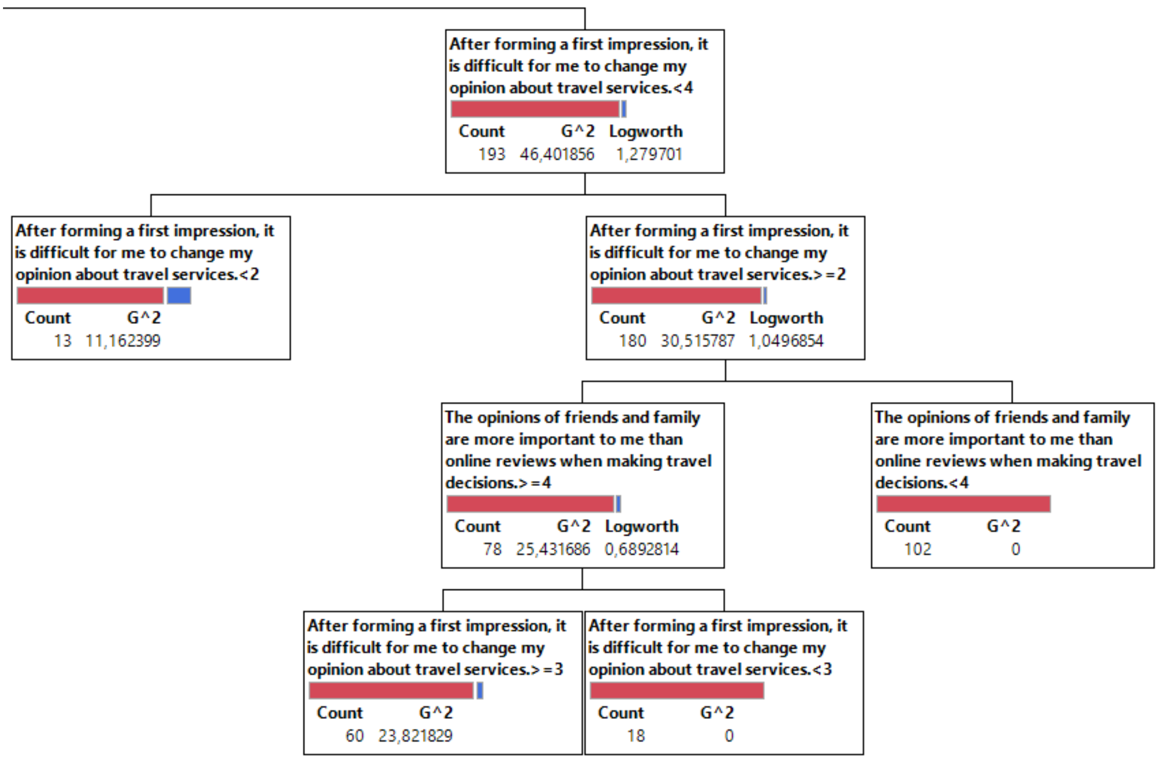

Figure 3/c. The real decision situation: decision tree (DTC) for Generation Z fillers, way 3; source: own analysis output

CONCLUSION

The aim of this research was to investigate how digitalisation influences the travel decision-making processes of Generations X, Y, and Z, and to identify the generational differences that emerge in tourism consumer behaviour. Through a quantitative approach supported by literature review and decision tree modelling, we examined not only how these cohorts access and process digital information but also the weight they assign to various factors when making travel-related choices.

Our findings confirm that digitalisation is a key determinant in travel decision-making for all generations, but its effects manifest differently depending on the age group. These results are consistent with recent research Zsarnóczky (2024) observed that Generation Y's reliance on online reviews and peer feedback aligns with our conclusion that online reviews, particularly negative ones, weigh heavily on their travel decisions. His work further reinforces the significance of electronic word-of-mouth (e-WOM) as a key driver for Gen Y consumers. For Generation X, digital platforms are functional tools that must convey reliability and trust, primarily through clear structure, security, and professionalism in design. Generation Y, shaped by the rise of digital technologies during their formative years, relies extensively on online reviews and peer feedback—especially negative reviews—before committing to a travel purchase. Generation Z, being digital natives, exhibits a stronger emotional and visual attachment to content encountered on mobile platforms and social media, often prioritising the aesthetic appeal and ease of access over traditional markers of credibility.

While price sensitivity was found to be a universal factor, the generational motivations that accompany it differ significantly. Generation X focuses on affordability and cautious comparison, Generation Y seeks value and is more willing to invest in quality if convinced, and Generation Z demonstrates both high price awareness and responsiveness to digital influence such as social proof or viral content.

Beyond the specific findings of this study, several broader and generalisable insights emerge. First, the research validates the relevance of using a generational framework to understand evolving patterns in digital consumer behaviour. In an era where digital technologies continue to transform the tourism industry, recognising how different age cohorts engage with online tools—such as websites, reviews, or social media—is vital for developing tailored marketing strategies. This is consistent with the findings of Buhalis et al. (2024), who emphasise that the role of digitalisation in tourism varies significantly across generations.

Furthermore, Hiezl and Gyurácz-Németh (2025) highlight that generational segments differ markedly in their preferences for digital versus personal interactions. These insights underscore the necessity for tourism marketers to adopt generationally nuanced approaches, especially in the context of ongoing digital transformation.Second, our results support the theoretical distinction between traditional word-of-mouth (WOM) and electronic word-of-mouth (e-WOM) as separate influence mechanisms. While personal recommendations retain their power among older generations, e-WOM has become a decisive factor for younger users. This highlights the importance of managing digital reputation, online review platforms, and user-generated content in tourism communication.

Third, the emotional and psychological dimensions of digital interaction are becoming increasingly important. For Generation Z especially, decision-making is not purely rational or economic—it is shaped by the immediacy, interactivity, and emotional resonance of digital content. This underlines the need for experience-driven and emotionally engaging content strategies in digital tourism marketing.

Fourth, the study draws attention to the design-related factors that affect digital trust and consumer conversion: website usability, mobile optimisation, brand aesthetics, and coherent visual identity all emerged as meaningful elements in building user confidence and influencing booking intent. These insights are applicable not only in tourism but across sectors where digital presence substitutes or precedes physical interaction.

Finally, the research confirms that digital maturity—defined not only by technical skills but by critical information-processing habits—varies between generations and should be considered in tourism education, destination management, and policy planning. Service providers, platforms, and policymakers must avoid one-size-fits-all approaches and instead embrace personalised digitalisation—one that is inclusive of generational diversity and adaptable to rapid technological change.

In conclusion, while digitalisation acts as a unifying backdrop across all generations, it is the interplay between technology, trust, values, and generational identity that ultimately shapes travel decision-making in the digital era. These findings are not only relevant for tourism marketing professionals but also provide a foundation for future academic studies exploring the human side of digital transformation in tourism and beyond.

Author Contributions: Conceptualization, M.K. methodology, M.K.; software, M.K.; validation, M.K; formal analysis, M.K.; investigation, M.K. and V.K.; data curation, M.K., V.K, T, Sz.; writing - original draft preparation, Zs.I.H.; V.K.. and M.K.; writing - review and editing V.K.; Zs.I.H. and M.K; visualization M.K. supervision, Zs.I.H., V.K. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgements: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Aina, A. O., & Ezeuduji, I. O. (2021). The Influence of Socio-Demographic Factors on Perceptions of Domestic Tourism: The Case of Generation Z. *African Journal of Hospitality, Tourism and Leisure*, 10(4), 1503–1515. https://doi.org/10.46222/ajhtl.19770720-175

Assiouras, I., Giannopoulos, A., Mavragani, E., & Buhalis, D. (2024). Virtual Reality Facilitated Travel Inspiration: The Role of Pleasure and Arousal. *Current Issues in Tourism*. https://doi.org/10.1080/13683500.2024.2406412

Becker digital, (2023). Tourism Marketing Strategies for Multiple Generations in: (Retrieved: 07.02.2025). https://www.becker-digital.com/blog/tourism-marketing-multiple-generations?utm_source=chatgpt.com

Berényi, Cs., & Csiszárik-Kocsir, Á. (2023). *Digitális eszközhasználat és digitális tudatosság a középiskolás diákok körében egy primer kutatás eredményei alapján*. *[Digital device use and digital awareness among high school students based on the results of a primary research]*. In: Bodáné, Kendrovics R. (ed.) *A tudomány és az oktatás felelőssége, [The responsibility of science and education]*. *Proceeding Book*, Budapest, 355-363 (in Hungarian).

Bilan, Y., Tovmasyan, G., & Dallakyan, S. (2024). The Impact of Digital Technologies on Tourists' Travel Choices and Overall Experience. *Journal of Tourism and Services*, 15(29), 153–175. https://doi.org/10.29036/jots.v15i29.805

Buhalis, D., & Amaranggana, A. (2014). Smart tourism destinations. In: *Information and Communication Technologies in Tourism*, 553–564, Springer. https://doi.org/10.1007/978-3-319-03973-2_40

Buhalis, D., Leung, D., & Lin, M. (2023). Metaverse as a Disruptive Technology Revolutionising Tourism Management and Marketing. *Tourism Management*, 97, 104724. https://doi.org/10.1016/j.tourman.2023.104724

Buhalis, D., Efthymiou, L., Uzunboylu, N., and Thrassou, A., (2024). Charting the Progress of Technology Adoption in Tourism and Hospitality in the Era of Industry 4.0, *Euromed Journal of Business* (EMJB). EMJB-11-2023-0310.R1 Csiszárik-Kocsir, Á. (2024). *A különböző generációk digitális jelenlétének háttérmotívumai, [The background motives behind the digital presence of different generations]*. In: Varga, J., Csiszárik-Kocsir, Á, & Garai-Fodor, M. (ed.) *Vállalkozásfejlesztés a XXI. században I. kötet: Újszerű meglátások és hagyományos megoldások napjaink gazdasági és társadalmi problémáinak kezelésében [Entrepreneurship development in the 21st Century Volume I: Innovative Insights and Traditional Solutions to Address Today's Economic and Social Problems]*. Budapest, Magyarország: Óbudai Egyetem, Keleti Károly Gazdasági Kar, 266-277 (in Hungarian).

Danyi, P., Iványi, T., & Veres, I. (2020). *A turizmus jelene és várható változása a mesterséges intelligencia integrálásával, különösen a Z generáció igényeire fókuszálva, [The present and expected changes in tourism with the integration of artificial intelligence, especially focusing on the needs of generation Z]*. *Vezetéstudomány* / *Budapest Management Review*, LI. évf. 19-34 (in Hungarian) https://doi.org/10.14267/VEZTUD.2020.KSZ.03

Farkas, I. J., Hogan, P. D., Uhlenberg, P., Treas, J., Bengtson, L. V., Schaie, K. W., & Burton, L. (1995). *Demography of changing intergenerational relationships.* In: Bengtson, L. V., Schaie, K. W., & Burton, L. (eds.). Adult Intergenerational Relations: Effects of Societal Change. New York, Springer.

Garai-Fodor, M. (2020). *Az önkéntességre motiváló tényezők és az értékrend összefüggése a hazai Z generáció körében. [The relationship between factors motivating volunteering and values among Hungarian Generation Z]. Polgári Szemle* / Civic Review, 16(46), 298-305, (in Hungarian). https://doi.org/10.24307/psz.2020.1022

Garai-Fodor, M., & Csiszárik-Kocsir, Á. (2018). *Értékrendalapú fogyasztói magatartásmodellek érvényessége a Z- és Y-generáció pénzügyi tudatossága esetén. [Validity of value-based consumer behavior models in the case of financial awareness of Generation Z and Generation Y]*. *Pénzügyi Szemle / Financial Review*, 63(4), 518-536 (in Hungarian).

Happ, É., & Ivancsó-Horváth, Zs. (2018). Digital tourism is the challenge of future: a new approach to tourism – *Knowledge Horizons - Economics* 10(2), 9-16.

Happ, É., Ivancsóné Horváth, Zs., & Kupi, M. (2020). *Digitális eszközök és módszerek használatának marketingszempontú feltáró elemzése a magyar turisták körében [Exploratory analysis of the use of digital tools and methods among Hungarian tourists from a marketing perspective]*. *Turizmus Bulletin / Tourism Bulletin* 20(2), 4-13., (in Hungarian). https://doi.org/10.14267/TURBULL.2020v20n2.1

Hiezl, K., & Gyurácz-Németh, P. (2025). Is High-Touch Enough? Personalization-Supporting Technology in Hotel Service: A Data-Driven Approach. *Strategic Change*, 0:1–22. https://doi.org/10.1002/jsc.2663

Issakov, Y., Aktymbayeva, B., Artemyev, A., Kubessova, G., Abdreyeva, S., Surina, A., Tuyebekova, Z., El Archi, Y., Benbba, B., & Dávid, L. D. (2023). Digital transformation reshaping tourism education: Investigating the influence of MOOCs on teaching tourism fundamentals and local lore. *GeoJournal of Tourism and Geosites*, 49(3), 1006–1013. https://doi.org/10.30892/gtg.49316-1100

Ivancsóné, Horváth, Zs., Raffay, Z., & Happ, É. (2025). Digitalisation in angling tourism: Introducing new technologies to a traditional tourism product. *GeoJournal of Tourism and Geosites*, 58(1), 42–50. https://doi.org/10.30892/gtg.58104-1389

Ivancsóné Horváth Zs., Printz-Markó E., & Darabos F. (2017). *Wellness generációk – Generációk a wellnessben. [Wellness Generations – Generations in Wellness]*. In: Reisinger, A, & Kecskés, P. (ed.) *„Ifjúság - jövőképek": Kautz Gyula Emlékkonferencia 2016. június 15. elektronikus formában megjelenő kötete ["Youth - Visions of the Future": The volume of the Kautz Gyula Memorial Conference, published in electronic form on June 15, 2016]*. Győr, Magyarország: Széchenyi István Egyetem, 1-13. (in Hungarian).

Kantar, (2025). *How generational travel habits are shaping the future of tourism*. (Retrieved: 27.04.2025). https://www.kantar.com/inspiration/research-services/travel-habits-of-generations-pf com

Kissné, A. K. (2014). *Generációk, munkaerőpiac és a motiváció kérdései a 21. században*. [Generations, labor market and motivation issues in the 21st century]. *HR Magazin* (in Hungarian).

Kökény, L., & Jászberényi, M. (2022). *Hogyan utazik a Z generáció? Utazással kapcsolatos szokások és döntési folyamatok vizsgálata. In: Együttműködés, partnerség, hálózatok a turizmusban*. *[How does Generation Z travel? An examination of travel-related habits and decision-making processes. In: Cooperation, partnership, networks in tourism]*. *Turizmus Akadémia / Tourism Academy* (11). Kodolányi János Egyetem, Csillagászati és Földtudományi Kutatóközpont Földrajztudományi Intézet, Magyar Földrajzi Társaság, Székesfehérvár, Budapest, 187-196 (in Hungarian).

Kupi, M., Tóth, E., & Nagy, D. (2023). *Guests' satisfaction in Győr-Moson-Sopron County, in Hungary*. *GeoJournal of Tourism and Geosites,* 50(4), 1253–1259. https://doi.org/10.30892/gtg.50405-1123

Martzoukou, K., & Elliott, J. (2016). The Development of Digital Literacy and Inclusion Skills of Public Librarians. *Communications in Information Literacy*, 10 (1), 99115. https://doi.org/10.15760/comminfolit.2016.10.1.17

McCrindle, M., & Wolfinger, E. (2010). *The ABC of XYZ: Understanding the Global Generations*, University of New South Wales Press Ltd, Sydney, Australia.

Mamengko, R. P., Lee, L. C., & Chen, K. H. (2024). A Cross-Generational Investigation of Tourism Decision-Making on Social Media: Implications for Marketing and Destination Management. Proceedings of the International Conference on Hospitality and Tourism Management, 8(1). https://doi.org/10.17501/23572612.2024.8101

Orabi, R. M. (2022). Generational Differences in the Travel Decision-Making Process: A Comparative Study Between Generation X, Y and Z as Moderating Variables. *Journal of the Faculty of Tourism and Hotels*, 11(2), 205–270. https://doi.org/10.21608/mkaf.2022.254035

Panoiu, T. M., & Foris, D. (2024). The Influence of Online Booking Platforms on Travel Decision-Making. Bulletin of the Transilvania University of Brasov. Series V: *Economic Sciences*, 17(66), 2. https://doi.org/10.31926/but.es.2024.17.66.2.5

Rudež, H. N. (2023). What Features of Digital Travel-Related Information is Generation Z Looking For? *Tourism and Hospitality Management*, 29(4), 495–504. https://doi.org/10.20867/thm.29.4.2

Tang, L., Xiong, C., & Zhang, L. (2015). Decision tree method for modeling travel mode switching in a dynamic behavioral process. *Transportation Planning and Technology*, 38(8), 833–850. https://doi.org/10.1080/03081060.2015.1079385

Tóth-Kaszás, N. (2018). *A települési kötődés és a Z generáció – egy magyarországi középváros példája. [The settlement engagement and the Z generation -The example of a Hungarian city]. Deturope – The Central European Journal of regional Development and Tourism*, 10. évf. 1 szám (in Hungarian).

Törőcsik, M. (2011). *Fogyasztói magatartás Insight, trendek, vásárlók, [Consumer behavior - Insight, trends, customers].* Akadémiai Kiadó, Budapest (in Hungarian).

Törőcsik, M., Szűcs, K., & Kehl, D. (2014). Generációs gondolkodás – A Z és az Y generáció életstílus csoportjai. [Generational Thinking – Lifestyle Groups of Generation Z and Generation Y]. *Marketing & Menedzsment / Marketing & Management*, 48. (2)3-15 (in Hungarian).

Törőcsik, M. (2016). *Generációs kutatás [Generational research]. in*: trendinspiracio.hu/generacios-kutatas/ 2016 (in Hungarian).

Varga, J. (2023a). Exploring the link between competitiveness and innovation. In: Szakál, A. (ed.) *SISY 2023 IEEE 21st International Symposium on Intelligent Systems and Informatics*. Budapest, Magyarország: IEEE Hungary Section, 229-233. https://doi.org/10.1109/SISY60376.2023.10417738

Varga, J. (2023b). The potential benefits of innovation as seen by some domestic businesses. In: Szakál, A. (ed.) *SISY 2023 IEEE 21st International Symposium on Intelligent Systems and Informatics*. Budapest, Magyarország: IEEE Hungary Section, 223-228. https://doi.org/10.1109/SISY60376.2023.10417737

Varadzhakova, D., & Naydenov, A. (2024). Does the generation influence domestic leisure tourism practices? The case of Bulgaria. *Geojournal of Tourism and Geosites*, 53(2), 687–696. https://doi.org/10.30892/gtg.53232-1244

Vu, T. T. H., Hoang, H. H., Hoang, T. N. N., & Nguyen, X. L. (2025). Bibliometric and content analysis of global trends in digital transformation and rural tourism. *GeoJournal of Tourism and Geosites*, 58(1), 161–175. https://doi.org/10.30892/gtg.58114-1399

Wang, K., & Wang, X. (2022). *Generational Differences in Automobility: Comparing America's Millennials and Gen Xers Using Gradient Boosting Decision Trees*. arXiv preprint arXiv:2206.11056. https://doi.org/10.1016/j.cities.2021.103204

Williams, K. C., & Page, R. A. (2011). Marketing to the generations. *Journal of behavioral studies in business*, 3(1), 37-53.

Seyfi S., Vo-Thanh T., Zaman, M. (2024). Hospitality in the Age of Gen Z: A Critical Reflection on Evolving Customer and Workforce Expectations. International *Journal of Contemporary Hospitality Management*, 36(13), 118–134. https://doi.org/10.1108/IJCHM-01-2024-0035Yılmaz, E. (2024). Understanding generational differences in destination choice priorities: A comparative analysis of Gen X, Y, and Z. *EBYÜ İİBF Dergisi*, 6(2), 56–71. https://doi.org/10.46482/ebyuiibfdergi.1589481

Zsarnóczky, M. (2018). *Generációs sajátosságok vizsgálata turizmus fogyasztási szokások alapján. [Examining generational characteristics based on tourism consumption habits*]. in: Tudományos Mozaik 15.

Zsarnóczky, G. (2024). The role of e-WOM in shaping travel decisions: A generational perspective. *Tourism Research Journal*, 29(1), 102–117. https://doi.org/10.1108/TRJ-02-2024-0117

https://www.vg.hu/vilaggazdasag-magyar-gazdasag/2023/07/hetvegere-a-felgyorsulo-vilagban-nonek-a-generacios-kulonbsegek (Retrieved: 22.02.2025)
https://archive.nytimes.com/schott.blogs.nytimes.com/2010/01/19/generation-xd/ (Retrieved: 22.02. 2025)

Article history: Received: 06.03.2025 Revised: 28.05.2025 Accepted: 20.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1315-1326
DOI 10.30892/gtg.602spl27-1503

A TALE FROM GODS OWN COUNTRY: WALKING WOUNDED HILLS AND STRATEGIES TO RESTORE THE PARADISE

Bindi VARGHESE [1*], K. LAKSHMYPRIYA [2], Sandhya H [1], Antony DAVIS [3], Tomy K. KALLARAKAL [4]

[1] Tourism Management, CHRIST University, Bangalore, Karnataka, India; Bindi.varghese@christuniversity.in (B.V.); Sandhya.h@christuniversity.in (S.H.)
[2] School of Business & Management, CHRIST University, Bangalore, Karnataka, India; lakshmypriya.k@christuniversity.in (K.L.)
[3] Christ Academy Institute for Advanced Studies, Bangalore, Karnataka, India; antony.davis@res.christuniversity.in (A.D.)
[4] School of Commerce, Finance and Accountancy, CHRIST, Bengaluru, Karnataka, India; tomy.kk@christuniversity.in (T.K.K.)

Citation: Varghese, B., Lakshmypriya, K., Sandhya, H., Davis, A., & Kallarakal, T.K. (2025). A tale from gods own country: Walking wounded hills and strategies to restore the paradise. *Geojournal of Tourism and Geosites*, 60(2spl), 1315–1326. https://doi.org/10.30892/gtg.602spl27-1503

Abstract: This article examines how a destination in crisis recoup after a devastating disaster and how the stakeholders are impacted by the disaster and explores the need of a strong destination governance policy in crisis situation. In the crisis settings the study includes a qualitative approach to understand the stakeholders' impact and disaster assessment process that examines various facets of the natural disaster through a structured discussion with the impacted stakeholders. The study's primary focus is on the crisis management strategies adopted by the impacted district, Wayanad; to tackle the challenges that localities face within the devastating situation. This study proposes a framework that could facilitate speedy crisis management responses. The findings indicate the role of governing bodies, in handling crisis management scenario over internal strategies and strategy formulation. The dynamics of stakeholder engagement and tactical perspectives adopted by the state in the given prominence. This study examines how the Governing bodies and practitioners of the local governing authority; interpret the crisis situation and explores the tactical and strategic management initiatives for repositioning and rebranding tourism. The natural calamity has had a significant impact on the Livelihood and Topography of Wayanad, Kerala, India, making it extremely susceptible. This study aims to investigate how community resilience and rehabilitation were impacted by the natural catastrophe and the response of the key stakeholders. Design/ Methodology/ Approach – The study analyses the impact of disaster and examine a multi-stakeholder assessment to capture varied dimensions of the disaster through a structured conversation. The research engages a qualitative approach and the data is captured through semi-structured interviews from the local community, tour operators, and destination management companies in Wayanad. A conceptual framework for community resilience competencies is proposed in the study, which may help with quick crisis management responses. The study's sample consists of key stakeholders; including representatives from the tourism industry, including leaders from the community, and local residents. The qualitative findings identify the disaster recovery strategies while, handling crisis management scenarios and examines the resilience mechanism adopted at the disaster struck regions by the stakeholders. The results strongly indicate; an imperative need for a good governance as an archetype for practitioners to lead with tactical and strategic measures to sustain the vulnerabilities. Lack of pre-disaster communications and protocols were missing elements leading to the devastating scenario during the disaster. Mechanisms for boosting tourism was lead well with the help of travel influencers and repositioning the destination image. Along with possible strategies and ideas that can help Wayanad's tourism industry, particularly in the post-disaster phase, this paper indicates strategies to restore the destinations brand identity and reputation. The study supports the "New phase of Normalcy" by including ideas and mitigative measures that the public sector should implement to address safety concerns. The State has well begun with the new reinstating tourism strategy through the new campaign "Ente Keralam, Ennum Sundaram" (My Kerala Ever Beautiful).

Keywords: disaster management, destination resilience, community sensitization, destination management theory, Stakeholder Alliance

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INTRODUCTION

Climatic change has considerably affected the ecological balance and according to the UN report 2023, 90 percent of natural disasters are the outcome of weather and water related impact on the environment resulting in floods, landslides, drought, wildfires and pollution. It is important that we acknowledge and act understating the underlying interactions between human settlements and environment and the long term endurance of nature and its counter reactions on exploitative human activity on environment. In addition to being the most populated nation on Earth, India is one of the top emitters of gases that warm the globe today and is regarded as one of the most climate-vulnerable areas globally. Every year India grapples with torrential rains along with flash floods and landslides in almost every part of the country. In the

[*] Corresponding author

Indian state of Himachal Pradesh, located in the Himalayas, excessive rainfall caused the deaths of over 400 people last year. Climate change has been linked to increased unpredictability in India's monsoon rains, according to several research. Environmentalist fear the impact of Monsoon downpours will lead to devastating impacts, and cause landslides and floods, until fossil fuels are replaced by renewable energy. In the next decades these issues will intensify with changes in topographic and geological changes and will have a socioeconomic impact on mankind as well as the entire biosphere.

The Centre for Science and Environment in New Delhi, a public interest advocacy organization, monitored extreme weather events in India in 2022. Based on the data, it was found that extreme weather events occurred on 314 of India's 365 days, meaning that at least one was recorded in some part of the country every day. According to the report's results, these disasters caused almost 2 million hectares of damage, over 3,000 fatalities, over 69,000 cattle deaths, and about 420,000 dwelling damages in 2022 (Perinchery, 2024). According to a study published by the UN Intergovernmental Panel on Climate Change in 2022 India is one of the countries which would have devastating effects of climatic change.

This is very evident from the recent changes in the intensity of natural disasters in the southern states of India especially in Kerala. Kerala, the southernmost state of India was insulated from extreme climatic conditions and extreme natural disasters on a regular basis until 2018, but 2018 witnessed devastating floods and landslides which had an intensive impact on the state's social, economic and ecological balance. This paper intends to open a discussion on the fact that societies and states have varied mechanisms for responding to environmental changes and calamities, the ideology of the society and the governance systems contribute to the alternes, proactiveness and resilience in these hard times in the backdrop of the devastating landslides that washed out 3 panchayaths in the district of Wayanad.

Climatic Change and Ecological Imbalances

Climatic change has affected societies and reshaped civilizations over the history and extensive literature points out on how climatic changes have wiped out civilisations and led to topographical changes (Yang et al., 2021; Chen et al., 2022). The recent incidents of landslides and floods that has been sweeping the country is more related to industrial activity which does not confirm to the norms of environmental sustainability. Industrial mining operations and related activities have a detrimental and sometimes irreversible effect on ecosystems (Sutrisno et al., 2024). It's important to consider the diversity, of trees found in the area, and the migration of species along topographical gradients, since unrestrained quarrying has an impact on the region's vegetation and geology **(**Becken & Hughey, 2013; Cehan & Ițu, 2024). Spatial variation with diversity is seen throughout the elevational regions among the hilly ecosystems that are experiencing a major ecological degradation (Chrobak & Cebulski, 2014). Tree diversity is spatially variable in hilly habitats that are undergoing significant ecological degradation, as shown across the elevational gradient (Thakur et al., 2022; Yangm et al., 2021). Mountains are ecosystems that are vulnerable and have unique features, so they must be carefully preserved. About 25% of the terrestrial biological variety on Earth is dependent on these environments for survival. Moreover, mountains are home to over half of the world's biodiversity hotspots (Singh et al., 2023).

The coexistence of unique species of flora and fauna varies across the mountain ranges depending on the climatic conditions, but they are also susceptible to any extreme changes in their habitat due to urbanisation, quarrying, deforestation, industrialisation and other scrupulous human activities that can result in massive natural calamities wiping off them from their natural occurrence (Coops et al., 2020; Sutrisno et al., 2024). Large studies have demonstrated the spatial distribution of species, which protect the ecosystem in hilly ranges, are negatively impacted by industrial activities **(**Huang et al., 2007; Biggs et al., 2012; Hall, 2010; Suhud et al., 2024). Any changes in the context lead to devastating effects. Typically mining and quarrying activities are placed at vulnerable and ecologically sensitive and semiarid places and these activities generate a lot of pressure on the ecological balance and creates climatic changes, this coupled with rapid industrialisation and boom in new age tourism activities and real estate results in ruthless exploitation (Gössling et al., 2018). The scientific community faces issues in assessing the consequences of climate change on the natural environment, and policymakers and decision-makers are faced with difficult choices on protection and sustainability aspects (Ritchie, 2008; El Gamil, 2023).

Study Setting: Kerala and the state of Wayanad over the years; a brief history of topography changes

Western Ghats mountain range, which is older than the Himalayan range, is home to important geomorphic features. The site's high montane forest habitats have an impact on the Indian monsoon weather pattern and with its unique biophysical and biological processes the location provides counteracting the surrounding area's tropical temperature with good monsoon. It boasts great endemism and biological diversity, making it one of the eight "hottest hotspots" of biological diversity in the world. The Ghats are a range of mountains that cut through the Indian states of Kerala, Tamil Nadu, Karnataka, Goa, Maharashtra, and Gujarat. They run parallel to the country's western coast and are about 30 to 50 kilometres inland. With the exception of the 30 kilometre Palghat Gap at approximately 11°N, this 1,600 km long range of mountains covers an area of over 140,000 km² (Western Ghats, UNESCO Report, 2012).

Kerala, the southernmost state is nestled between the Western Ghats making it highly prone to negative impact of climatic change. The 2018 weather-related disaster showed the vulnerability. The eastern part of Kerala, which is surrounded by the western flank of the Western Ghats, is one of the key areas in the country that is most prone to landslides. Landslides are prone every year along with monsoon season in the 1500 sq. km. vulnerable Western Ghats region. The state has not faced floods like those in 2018 for a century, which left 483 people dead and significant damage to the state. A landslide that occurred in Puthumala, Wayanad in 2019 added to the tragedy with a death toll 17 lives and misery. In 2021 53 people died because of landslides and heavy rains, while 18 people died and considerable property damage was caused by additional landslides and floods in 2022 (ET, Aug1, 2024). Kerala had the most landslides in India between 2015 and 2022.

Trajectory of Series of Devastating Events

On August 8, 2019, Kerala saw devastating floods and landslides because of heavy rainfall. Puthumala a plantation community in Meppadi panchayath, situated at an elevation of 1230 meters above mean sea level and 20 kilometres from Kalpetta in the Wayanad district was hit by a massive landslide. The landside's epicentre was 290 meters high on the mountain, and it descended 20 hectares of land, pushing it out to a distance of roughly 2 km. An initial smaller landslide that happened deep within the forest was the Puthumala landslide. A massive landslide resulted from the crushing of rocks and dirt under pressure. It was noticed that a sizable section of the hill had collapsed and that a vast stretch of the valley was covered with boulders, mud, and other debris. Several factors contributed to the occurrence of landslides in this area were excessive rainfall that caused the soil to break down, deforestation, shallow soil depth that allowed water to seep into soil piping or cavities, cardamom farming on the mountainside that caused the soil to become loose, disappearing stream lengths from construction and occupation, and mining and construction done without following scientific methods that altered the soil's structure (Desai et al., 2020). Around 100 acres of tea plantation land was washed away affecting the villagers livelihood as agriculture was their main means. In July, 2024 Kerala witnessed another devastating landslides claiming 420 lives,119 people missing and massive damage to the entire villages of Punjrimuttom, Mundakkai, Chooralmala, Vellarmala of Meppadi panchayath in Wayanad highlighting the area's continued battle with natural disasters The people who live in the villages of Mundakkai, Chooralmala, Attamala, and Lulupura have been severely impacted. About 1,721 dwellings were impacted by the landslide in Meppadi Grama Panchayat wards 10, 11, and 12.1,424 individuals in 601 households in Ward 10-Attamala, 1,247 individuals in 451 households in Ward 11-Mundakkai, and 2,162 individuals in 671 households in Ward 12-Chooralmala Under the direction of Uralungal Technology Solutions, 25 damaged structures, including homes and other buildings, have been identified by GIS mapping. Severe rainstorms are causing damage to standing crops and vegetables, water logging on highways, tree uprooting, and decreased visibility. The severe downpour caused damage to electricity cables and the loss of five transformers, which resulted in an interruption in the supply of power.

Figure 1. Satellite image of Wayanad landslide – July 2024 (Source: A: Wayanad Tragedy: Satellite Map Shows 'Crown' Of Landslide, Impact, Outlook Web Bureau (2023); B: Wayanad landslides: Here's what all happened so far, The Indian Express (2023); C: Wayanad Tragedy: Satellite Map Shows 'Crown' Of Landslide, Impact, Outlook Web Bureau (2023)

The only bridge that connected Mundakkai to nearby Chooralmala and the outside world was destroyed in the landslide that unleashed a new, ferocious river stream, leaving the village isolated for hours. Everything in its path, including the Vellarmala Government Vocational Higher Secondary School (GVHSS) at Chooralmala, was washed down by the "new" torrent of debris (Figure 1A). In just the Vellarmala GVHSS, 32 children lost their lives and Ten are still missing, according to the teachers who survived only 22 bodies were found ((Figure 1B). The headmaster of the school, Unnikrishnan who survived the calamity, told the media that they were devasted and still cannot recover from the shock of an overnight calamity claiming the entire quiet village and its people ((Figure 1C). Before and after images, released by NRSC of ISRO, of Chooralmala, in Wayanad district of Kerala, which was hit by a landslip on July 30, 2024 (Figure 1A, B and C).

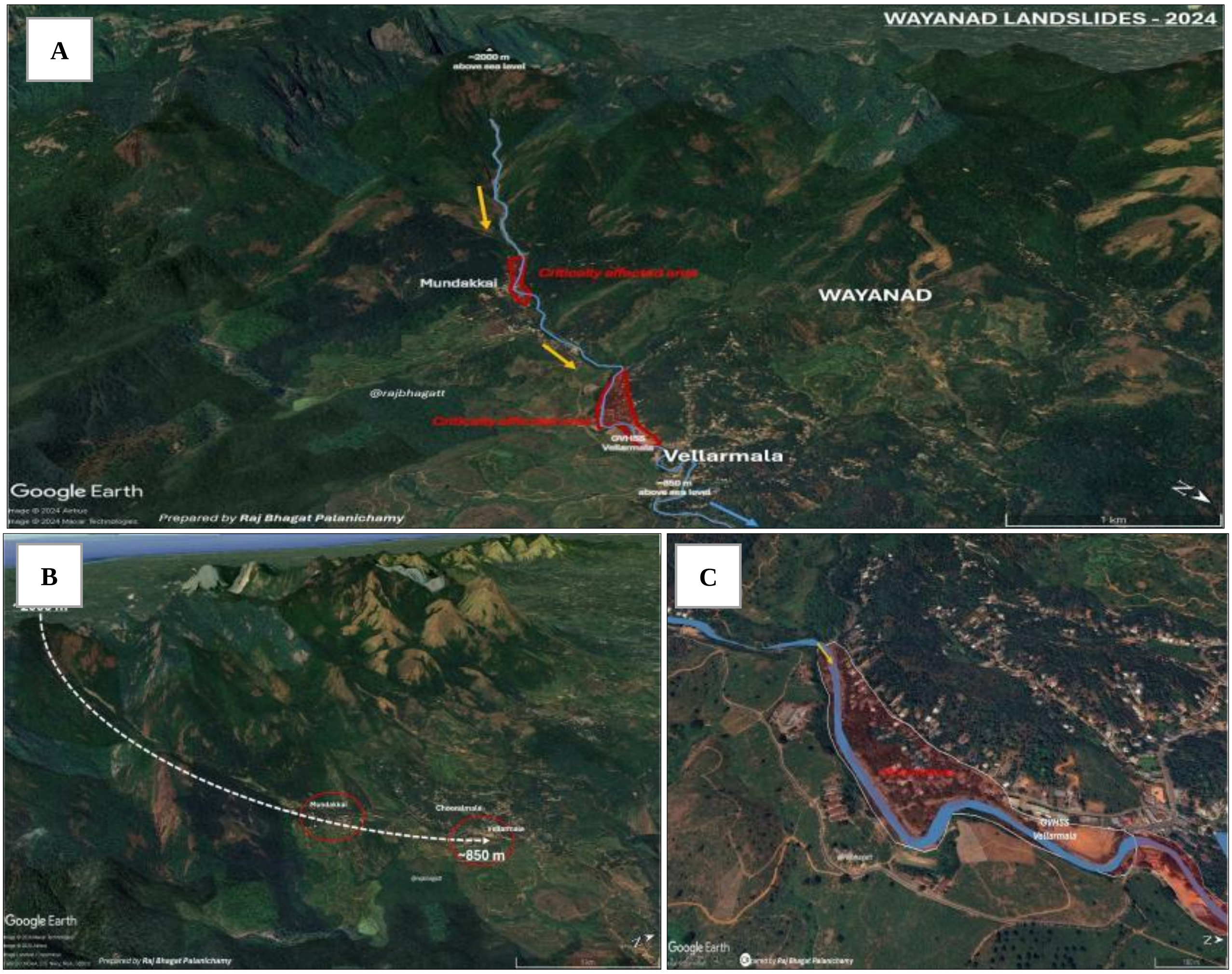

Figure 2. Landslide that hit Wayanad on July 30,2024; A - Landslide-affected areas in Wayanad;
B - Increased velocity due to a steep slope; C -Inundated areas in Wayanad (Source:https://theprint.in/theprint-essential/explained-with-maps-how-topography-human-density-led-to-devastation-in-keralas-wayanad/2202631/)

Landslides and cloudbursts have become a phenomenon in the Western Ghats over the last decade. A landslide can be defined as a downward movement of rock, soil, or both on the surface of a rupture, which might be planar (translational slide) or curved (rotational slide). Most of the material in a landslide travels as a coherent or semi coherent mass with minimal internal deformation (Highland et al., 2008). Note that other kinds of movement can also occur during landslides in some circumstances, either at the beginning of the failure or afterwards if the characteristics change as the displaced material goes downslope. The series of natural calamities in the form of landslides are mostly caused by human population growth settling on newly acquired land and developing cities, towns, and neighbourhoods along with mining and quarrying. Removing vegetation, undermining slopes, and altering natural drainage patterns are prominent human-induced factors that can cause landslides. Additional instances include undercutting the bottom of a slope and loading the top of a slope above the bearing capacity of the soil or other component material, causing oversteepening of the slope. Five years on after the landslide erased two hamlets in Wayanad's Meppadi panchayat — Pachakkad and Puthumala, a popular tourist destination and called as 'Mini Ooty' once upon a time things has not changed much , the negligence of the authorities in rebuilding the lives of the people who were hit by the landslides and in ensuring alertness and in regulating the unscrupulous environment degradation activities which was highlighted by the Western Ghats Ecology Expert panel also known as Gadgil commission has today become a death kennel for the Meppadi panchayat , the tragedy haunts again through the landslide that hit the Meppadi panchayat on 31, July 2024 claiming a greater catastrophe than the earlier one. The Google Earth images (Figure 2A, B and C) portrays the disastrous impact of the landslide on the hilly areas of wayanad.

The Loss and grief engulfed the whole hamlet , a few of the affected people who were coming into terms with reality and shared there harrowing experiences. Participant 1 said that all she could remember was that when she was bought to the relief camp none of her family members were there all have vanished, she also said that she hadn't got the time to gather her sense to think what was actually happening around. Another person said that they have lost all their earnings and are not sure of how to rebuild their lives. An endless stream of tales of grief, shock, and loss pour out of the relief camps. Families struggle with the shock of losing their houses and close ones. There is pain on every face, and some people are so broken-hearted that they can hardly come in terms with the tragedy. Parents cling to their children as if the kids are newborn as they feel haunted of losing dear ones. Elderly people have blank look on their face overwhelmed by the sudden loss of all their near ones and their entire savings of life which vanished overnight.

Every political party, religious organization, and social group has actually sent volunteers to Wayanad, in addition to Civil Defence, which is a civilian rescue force that is trained and operated by the Kerala Fire and Rescue Services department and the Kerala State Disaster Management Authority. The volunteers worked tirelessly and shared their experience of unearthing deceased people from the debris. According to data from the Accidental Deaths and Suicides reports published yearly between 2003 and 2022 by the National Crime Records Bureau, the recent landslide in Wayanad represents the highest death toll recorded in Kerala in over 20 years.

Gadgil Committee and Kasturirangan Committee Reports - Still Whose Apathy It Is?

According to the Gadgil committee report recommendation, eighty percent, of the Western Ghats should be declared an ESA. Further it sub-categorised the protected region into three zones and provided permissible activities for each zone. The Madhav Gadgil-led group suggested classifying Ecologically Sensitive Areas and Zones throughout the Western Ghats in its report. The ESZ - I and ESZ - II regions have explicit limitations and regulations on construction activity. The report suggested that red category industry and quarrying should be prohibited in ESZ-I. Sand mining, quarrying, and mining in sensitive places should be prohibited and strict regulations, on constructions for infrastructure development, were suggested in the report in these zones. With regards to the report's effect on livelihoods and development, numerous local groups and governments—including Kerala's—opposed it. It also recommended that quarries be at least 100 meters distant from populated areas in regions where quarrying was allowed. But eventually, the government shortened it to just 50 meters.

Later, the Gadgil report was rejected by the Union Government, and Kasturirangan chaired a new group tasked with producing a report. It has been suggested by the Gadgil panel that the Western Ghats as a whole be declared ESAs. However, the Kasturirangan committee limited the ESA's coverage to 37% of the Western Ghats. The Gadgil study had acknowledged the importance of the Western Ghats for the ecosystem. But for inconsequential political reasons, successive governments rejected it. People were worried that the implementation of this report would snatch them of their property , in fact many people from south Kerala had migrated to the forest ranges of Wayanad in the earlier times and have settled in this land undertaking agricultural and plantation activities (Jithendra Kumar, 2023). Due to the politically influential interests driving the region's voracious "development" initiatives through quarrying and mining coupled with deep-seated and widespread dissatisfaction with the way in which guidelines on these limited and allowed activities are implemented in the region. People who live in other places that have been designated as ecologically sensitive zones (ESZ) experienced harassment and denial of rights, especially the impoverished (Narain, 2024). Local communities have become more polarized and they do not want to partake in conservation. Wayanad comes under the Ecologically sensitive zone as per the WGEEP report and Vythiri, Mananthavadi and Sultan Bathery come under ESZ - I. Meppadi panchayat comes under Vythiri and hence it is under ESZ-1(The New Indian express, July 20, 2024). According to Gadgil, if the report's suggestions had been followed, the July 2024 catastrophe might have been averted. He pointed out that landslides have been caused by development and resort construction in the Western Ghats' delicate and exceedingly vulnerable areas. He said, referring to the catastrophe as "man-made," that "such activities should be prohibited."

Irrespective of whichever political party came to power in Kerala, all of them equally projected the committee's report to preserve the fragile Western Ghats as anti-people. The recurring landslides in this region are an indication that nature can no longer withstand the exploitation of its core in the name of developmental activities posed by unscrupulous human activity and the government's lack of Eco consciousness in acting upon the Western Ghats ecology expert panel report.

METHODOLOGY

The paper explores the reasons for recurring landslides and natural calamities over the past five years in Wayanad through extensive literature review, further the vulnerability and risk preparedness of the community and governance system is analysed through documented evidence, documentaries and an extensive analysis of community perspective towards responding to notifications and arrangements made for rehabilitation is explored (Figure 3). The methodology followed a rigorous systematic review of literature from peer reviewed journals followed by the primary observations about the destination pre and post the disaster (Issakov et al., 2025). This step was followed by the development of the tool for data collection and the actual data collection phase. The demographic profiling of the sample (Figure 4) shows the multitude of stakeholders from the region covered for the study. The study also focussed on assessing the various strategies and techniques used by Destination Management Organizations across the globe to ascertain the sustainable and resilient business practices adopted by them (Sukran et al., 2025; Šambronská et al., 2025). The key findings of the study was compared and contrasted with various prominent literature in the field of disaster management and destination management to develop a deep learning framework for Destination Management Organizations (Mokhtari & Hattab, 2025). The impact of these natural disasters and the need for A Deep learning Framework For Destination Management, which results in evaluating the mitigative measures and risk preparedness strategies are evolved through this study.

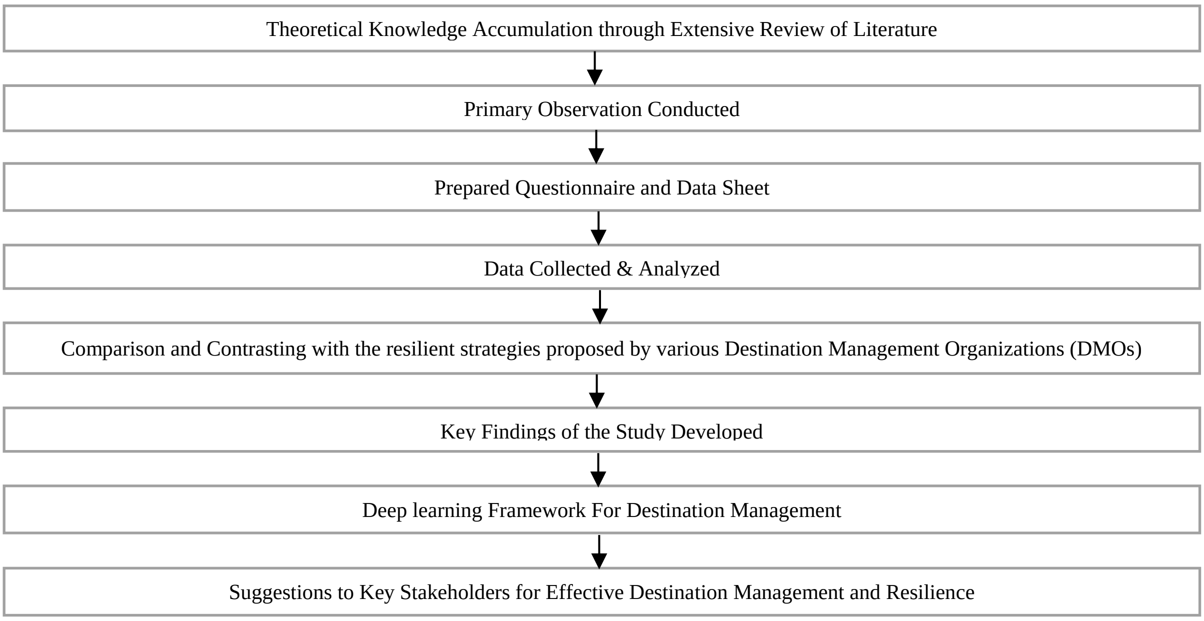

Figure 3. Flowchart of Research Methodology adopted in the present study(Source: Compiled by the authors)

Research Objective

- To explore the risk reduction measures in the pre-disaster stage and examine the effectiveness of adaptive policies for disaster recovery.
- To suggest strategies and indicate a support system to be provided by stakeholders which improves communication and understanding.

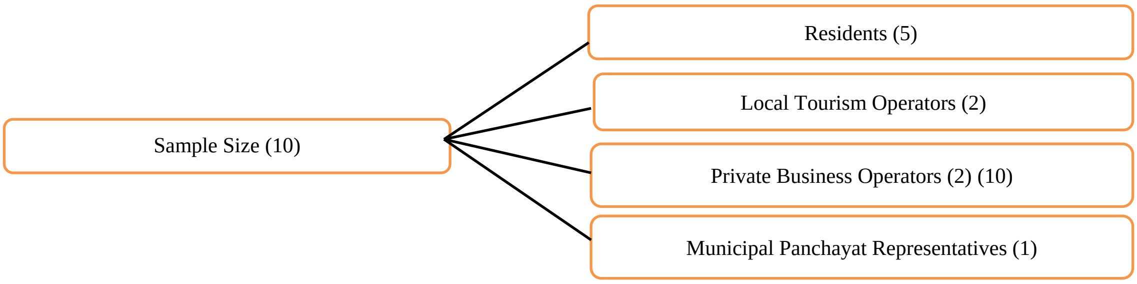

Figure 4. Demographic profile (Source: Compiled by the authors)

Data Analysis

The interview questions were primarily analysed and administered by each author, who then created distinct categories. "Member Checking" was used to ensure that transcripts were accurate and to validate data.

Table 1. Profile of respondents (Source: Compiled by the authors)

Respondents	Age / Gender	Position in the Organization	Years of Settlement
Respondent 1	53 / M	Local Resident	3 Generations
Respondent 2	48 / F	Local Businessmen	All Generations
Respondent 3	40 / M	Hospitality Business, Owner	25 Years
Respondent 4	41 / F	Local Resident	All Generations
Respondent 5	42 / M	Local Resident	All Generations
Respondent 6	45 / F	Taluk Office	21 Years
Respondent 7	38 / F	Local Resident	All Generations
Respondent 8	25 / M	Local Businessmen	All Generations
Respondent 9	44 / M	Travel Agent	All Generations
Respondent10	65 / F	Local Resident	4 Generations

The methodology comprised of a Word Cloud using Atlas.ti and with the data set an Sankey Diagram using the visualization tool was employed for the investigation. The data was analyzed using Atlas.ti as the authors engaged in data assessment process with an interpretive approach. First and foremost, a data table was made, and each author examined the information and made a note of the various participants' experiences. After the initial review, the following general research questions were poised:

a) Challenges faced by the community in the district of Wayanad as a result of Infrastructural development and government apathy affecting socio-environmental concerns?

b) What strategies can destinations implement to enhance their crisis preparedness and recovery plans post disaster?

c) What lessons can be learned from past crises and how can the crisis planning and destination management bring in an resilience?

FINDINGS AND DISCUSSION

After cross-examining the data, the results revealed that the Wayanad as a destination faced enormous pressure due to the approved and non-approved mining that took a toll with the downfall of the place. The destination was drastically affected with heavy monsoon and led to landslides with devastating loss of life. Furthermore, the stakeholders engagement were overseen with the feeling of temporariness and the aspiration that situations to go back to normalcy. Some of the emergent patterns as described in the Sankey Diagram were revealed by the in-depth interviews.

Table 2. Results of thematic analysis of the respondents (Source: Compiled by the authors)

Main Themes	Subthemes and Coding
Perception of the Stakeholders	**Concerns** • Political Will • Responsibility of Stakeholders • Geographic Vulnerabilities • Poor Crisis Preparedness • Magnanimity of Disaster
Relationship between Crisis and Coping Strategies	**Concerns** • Unified Risk Recovery Measures • Stakeholder Alliance • Mitigation Process
Barriers to Risk-Reduction Process and Conservational Measures	**Policy & Regulatory** • Lack of Policy Enforcement • Exploitation of Rules

Vulnerability and Risk Preparedness of the Community

As destinations experience a disaster; despite alerts and warnings, the receptibility towards risk preparedness and coping strategies are significant (Buhalis & Carlos,1996). This is one of the many factors that damage a destination's reputation and the sense of security that residents and visitors have in it. Therefore, in order to allay fears of this kind, any destination must be prepared to handle any emergency; then leading to a devastating situation (Buhalis & Costa, 2005). In view of the tragedy that struck Wayanad, where intense rains and landslides resulted in flash floods that engulfed four towns of the district, causing severe damage, fatalities, and devastating situation among the locals (Mikušová & Horváthová, 2019). The vulnerability of the locale is one of the main issues without proper contingency planning. For any vulnerable and fragile tourist site, disaster management is crucial; especially in the face of a crisis. Specific calamities that affect any town, with natural disasters demands a risk management approach in a pre-disaster stage (Hunt & Menon, 2020). Every possible location is vulnerable to one or more of the aforementioned risks, which may raise concerns about the security for locals and damage the profile of the destination's reputation largely (Ramachandra.T.V. et. al, 2023; Prideaux & Cooper, 2002). As such, it is imperative that all stakeholders should analyse the disaster and its intensity and thereby create backup plans in order to respond to varying levels of threats initiative (Barbhuiya & Chatterjee, 2020).

After a devastating disaster, the wounded hills of Wayanad recommend a number of actions for disaster management (Pyke et al., 2018). The challenges for the administrators of the State and local authorities are to examine the details of disaster and disaster management strategies **(**Faulkner, 2001)**.** The current situation ideates the degrees to which emergency services are initiated and examines the recovery phase when crisis overrules. Perhaps, those factors do not represent the totality of disaster-stricken hills; but can impact the burnout among the stakeholder (David et al., 2019). Certainly, the prime concern can extend to the strategies imbibed as to; how to bring the destination back to normal, how to handle destination marketing during a crisis, and the significance of destination management by putting Destination Management System in place with Destination Management Organizations (DMOs) and conduct a marketing campaign to restore its image and recover its market from the damage caused by these events (Haldon et al., 2018; Varghese, 2016).

This study examines the effects of Wayanad on the disaster and offers the various steps that constitute an effective disaster management plan. Figure 3: A Deep Learning Framework for Disaster Management aims to provide a tactical and strategic method for disaster recovery through a systematic approach that will aid in restoring the destination's success. Taneja et al., (2014) states Furthermore, the paper discusses marketing strategies and campaigns to repair the destination's damaged reputation and, in the end, suggests the significance of destination management through the establishment of Destination Management systems through a DMO (Wright et al., 2013; Gurtner, 2007).

Case Profile: Walking Wounded Hills and The Methods to Reinstate Its Glorious Past

The Western Ghats are known worldwide for their significant contribution to the preservation of biological variety. In addition, they include regions with exceptional geological, cultural, and aesthetic significance. The location provides one of the best depictions of the monsoon system in the world, counteracting the surrounding area's tropical temperature. It boasts an exceptionally high level of endemism and biological diversity, making it one of the eight "hottest hotspots" of biological diversity in the world. Wayanad is the most picturesque destination attracting a lot of tourist for an attractive and immersive touristic experience. In the last 3 decades, Wayanad has witnessed large and massive infrastructural changes with high-end resorts with large scale developments. Land sharks were drawn in by the expanding tourism sector, and they built hotels, resorts, and other tourist attractions that disregarded varied environmental concerns. In this environmentally sensitive location, resorts and hotels have proliferated throughout time. A few of the hotels were constructed on the banks of many small streams, giving visitors a bird's-eye perspective of the beautiful surroundings as they wind through the hilly regions. Therefore, many of these hotels and neighbourhood houses were washed away along with the people who were staying in them when flash floods hit the valley. It takes little to cause landslides because of the hills' delicate and fragile nature.

In addition, there are claims that the illegal quarries along the rocks are inviting disasters, which only serves to highlight the state's incompetence, lack of pre-disaster planning, and lack of evacuation protocols, all of which are clearly visible in the extensive damage. In actuality, the situation has gotten worse due to the increased amount of subpar infrastructure built by individuals who have no understanding how to build in the hills. The following are some of the main factors that made the disaster worse: a lack of awareness of alerts; the lack of an early warning system; a communication system that did not adapt to the local climate; the India Meteorological Department (IMD), which had issued warnings in advance predicting extreme rain conditions in Wayanad before the landslide and the massive flash floods; and, lastly, the lack of an action plan by the local administrators in the event of a disaster.

Strategies Towards Greater Preparedness

“Disasters are not learning processes. The State Disaster Management Authority must implement a disaster management plan as the first step in the efforts made by the authorities to prevent such recurrences. Vulnerable destinations prone to receive landslides and flash floods can implement measures like concrete plastering for steep hills to avoid or restrict landslides or minimalize the damages. Figure 5 are examples of concrete plastering done at steeper hills of Idukki district in the state of Kerala. Unexpected calamities hence necessitate the implementation of an efficient disaster management strategy and the creation of implementable disaster response programs by the State Disaster Management Authority.

Figure 5. Word Cloud developed with Atlas.ti. (Source: Developed by the authors)

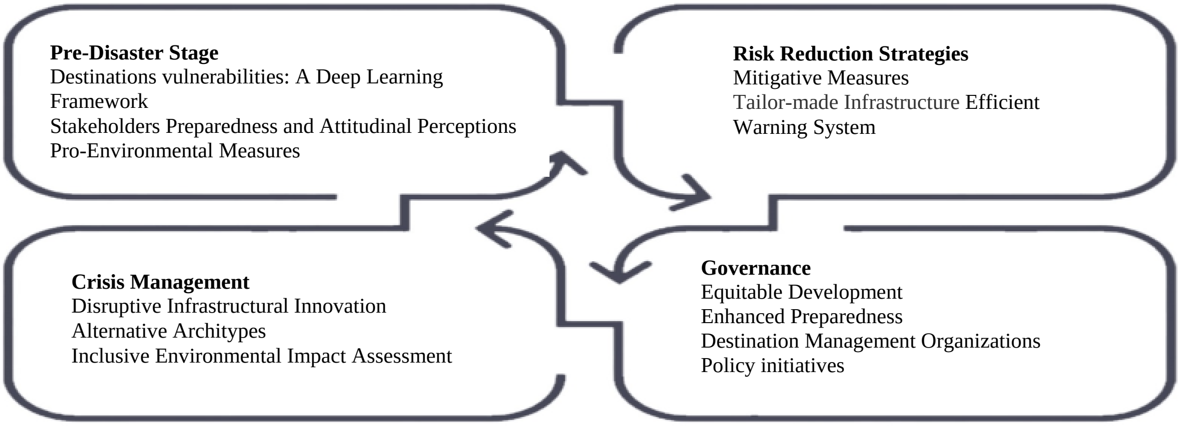

Figure 6. A Deep Learning Framework for Disaster Management (Source: Compiled by the authors)

Steps in Disaster Management

One of the many strategies to avoid serious damage from disasters is to be well-prepared to deal with them. To provide the wounded hills with strategies to deal with anticipated yet unprepared disasters, are an effective disaster management strategy that needs to be implemented (Miles et al., 2020). The implementation of an efficient disaster management plan is necessary. Some actions that can be taken to create a disaster management plan are listed below.

Strategic measures are taken during the Pre-Disaster Stage to reduce damage to individuals, properties, and the environment (Kim et a., 2020) This means that it is necessary to find out what steps are taken to mitigate the disaster's consequences on people and property before it happens (Zhou & Ramli, 2025). The implementation of an efficient warning system ahead of time and improved preparation are key components of effective crisis management and governance (Huang et al., 2007). The current situation is crucial for preparedness since it dictates whether or not workable contingency plans are in place to handle the current disaster. Here, locals and state representatives must be aware of what to do in case of an emergence (Yadav et al., 2018; Gaki & Koufodontis, 2022). The deep learning framework for disaster management in the study contributes to developing effective strategies to control and mitigate the impacts of landslides and ensure crisis management and governance plans to be executed at the disaster prone areas (Figure 6).

Figure 7. Original images of concrete plastering at steep hills (Source: Captured by the authors) Image A, B and C: Landslide aftermath near Chooralmala village, Wayanad district, Kerala; Photo taken on August 2, 2024, at 10:30 AM (IST). Location: 11.690°N, 76.265°E)

Following the disaster, rescue missions by the Armed Forces launched by the authorities in an effort to rescue victims, provide rehabilitation, and measures to facilitate financial support and ways to reconstruct the destination is the need of the hour (Varghese et.al 2022). A wide range of strategies, including building control booths, acting in line with the action plan, and disseminating crisis information, are taken to facilitate relief efforts and make the process of improved readiness more efficient (Hunt & Menon, 2020). In addition to getting things back to normal in the Post-Disaster Stage, it's also critical to make sure that the damage is limited in the terrible event that the disaster recurs (Ziari & Mosleh, 2025). Assistance, rehabilitation, and reconstruction are all included in restoration (Figure 7A, B and C). Rebuilding facilities with more competency than those constructed prior to the tragedy is deemed crucial during the Revival stage (Chennattuserry, 2022). The government can take fewer steps in order to properly prepare for the revitalization of the impacted communities. Rebuilding the impacted area and returning people's lives to normalcy is a lengthy process, made more difficult by the severe financial limitations that present (Mikušová & Horváthová, 2019). Adopting a suitable strategy to restore the destination's viability in the midst of a crisis is one appropriate way to make sure that destination is aided to recover soon (Arinta et al., 2023). The strategies to effectively manage the destination before, during and post the disaster is diagrammatically represented in Figure 8.

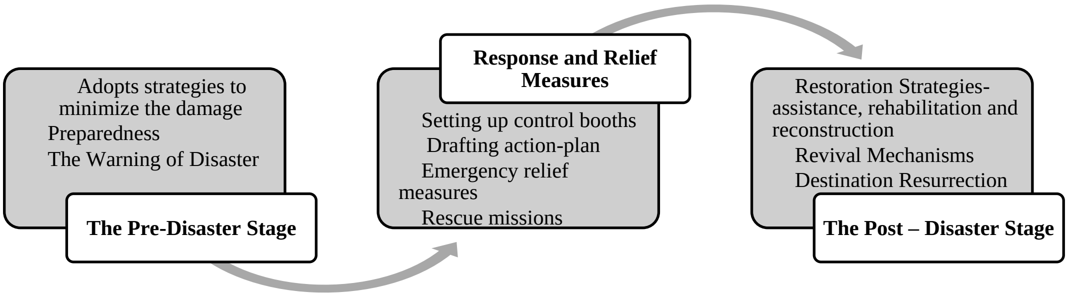

Figure 8. Disaster Management Framework (Source: Compiled by the authors)

CONCLUSION AND IMPLEMENTATION

A Sankey diagram (Figure 9) encapsulates a clear visual representation of intricate flows and relationships, making it a vital tool in crisis management. This technique presents a good comprehension for strategic measures that facilitate decisions by navigating through complex aspects of the crisis. The crisis scenario demands a good governance structure for effective destination management and speedy recovery. The higher and effective Environmental Impact Assessment connects well with a good strategy for ecological surveillance and restoration during a crisis (Pyke et al., 2018; Lazzari, 2023). Perhaps, the ideal crisis strategy accentuates the need for a scientific process of risk reduction measures in a complex situation like this and furthermore, with a comprehensive destination audit and an effective tactical planning the devastating results of predictive disasters can be controlled (Varghese & Chennattuserry, 2022). Hence an integrated approach with a disaster management framework can be the best in fostering risk-reduction and mitigation processes (Barbhuiya & Chatterjee, 2020).

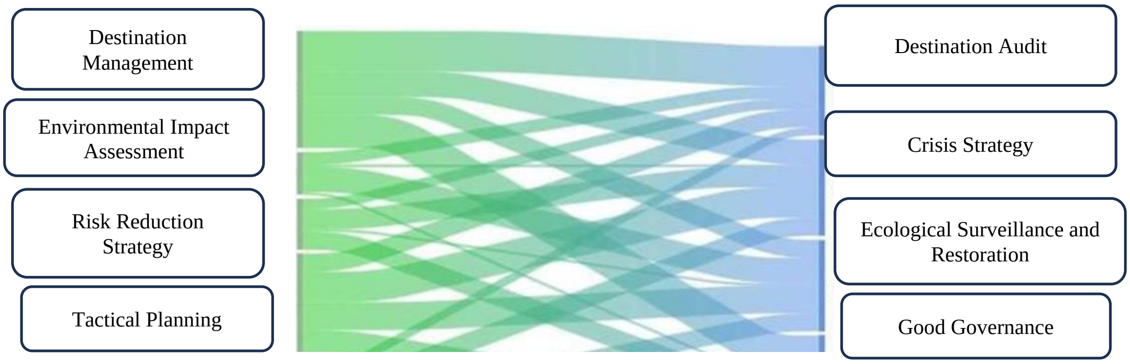

Figure 9. Sankey Diagram: (Source: Compiled by the authors)

Further, the focus and vested political interest in creating unrest among local communities stating issues of livelihood and economic growth has led to the different governments of the state ignoring and protesting the devastating consequences of ecological imbalance created by quarrying, mining and other detrimental activities in the region. The greed and vested interest of the political parties need to be curbed through social sensitisation and alternate government financial aid and rehabilitation support from the union government. The latest development as reported in Deccan herald daily on September 20, 2024 points out how all political parties have unified to protest against the sixth draft notification of the Western Ghats Eco Sensitive Area (ESA) which is an indicator of the politically triggered unrest with absolutely no concern on the issues and tragedies the people on the hills have met, The future is not just about restoration of livelihoods of people when a tragedy strikes but on building a holistic ecosystem that balances between human needs and environmental fragility.

Appendix

Broad Queries – Questions Posed to the Participants

A-What were the main challenges you encountered while residing in this region?

B- During the most recent natural disaster, what were the primary challenges you encountered? C- What were the public announcement policies in place prior to the crisis?

D- What coping strategies were employed, and how well was the discomfort managed?

E- What were the government reports' primary problems, and how were they resolved?

F- During the crisis, did you suffer any personal losses? How well does the government help people get over it?

G- What steps should the municipality take during the disaster?

Note: I= Key Community Concerns; II= Governance and Policies; III= Distress and Community Sensitization

Author Contributions: Conceptualization, B.V. and K.L., Methodology, K.L., and S.H.; software, K.L., B.V., and S.H.; validation, K.L. and B.V.; formal analysis, B.V. and K.L.; investigation, B.V., S.H., and A.D.; data curation, K.L.

and S.H.; writing - original draft preparation, B.V., S.H., and A.D.; writing - review and editing K.L. and S.H.; Supervision, T.K.K., and B.V.; Project Administration, T.K.K., and B.V. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgements: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Arinta, D., Sumarmi, Budijanto, & Susilo, S. (2023). Development of integrated and sustainable community-based eco-tourism on Sipelot Beach, Indonesia. *GeoJournal of Tourism and Geosites,* 46(1), 996–1006. https://doi.org/10.30892/gtg.46102-996

Barbhuiya, M. R., & Chatterjee, D. (2020). Vulnerability and Resilience of the Tourism Sector in India: Effects of natural disasters and internal conflict. *Tourism Management Perspectives,* 33(100616).

Becken, S., & Hughey, K. F. D. (2013). Linking tourism into emergency management structures to enhance disaster risk reduction. *Tourism Management,* 36, 77–85. https://doi.org/10.1016/j.tourman.2012.11.006

Biggs, D., Hall, C. M., & Stoeckl, N. (2012). The resilience of formal and informal tourism enterprises to disasters: Reef tourism in Phuket, Thailand. *Journal of Sustainable Tourism,* 20(5), 645–665. https://doi.org/10.1080/09669582.2011.630080

Buhalis, D., & Costa, C., (eds), (2005). Tourism Management Dynamics, Butterworth Heinemann ISBN-10: 0750663782. http://goo.gl/EfGbhH. https://doi.org/10.13140/2.1.3846.9449

Cehan, A., & Iațu, C. (2024). A Geographical Perspective On The Impact Of Covid-19 On Tourism Demand In Romania. *GeoJournal of Tourism and Geosites*, 52(1), 165–175. https://doi.org/10.30892/gtg.52115-1192

Chen, F., Martín, H., Zhao, X., Roig, F., Zhang, H., Wang, S., Yue, W., & Chen, Y. (2022). Abnormally low precipitation-induced ecological imbalance contributed to the fall of the Ming Dynasty: New evidence from tree rings. *Climatic Change,* 173(1), 13. https://doi.org/10.1007/s10584-022-03406-y

Chen, F., Yuan, Y., Trouet, V., Büntgen, U., Esper, J., Chen, F., & Zhang, H. (2022). Ecological and societal effects of Central Asian streamflow variation over the past eight centuries. *NPJ Clim Atmos Sci* 5(1):1–8. https:// doi.org/10.1038/s41612-022-00239-5

Chennattuserry, J. C., Varghese, B., Elangovan, N., & Sandhya, H. (2022). Pandemic Recovery Strategies: A Disaster Management Tourism Framework. Korstanje, M.E., Seraphin, H. and Maingi, S.W. (Ed.) Tourism Through Troubled Times (Tourism Security-Safety and Post Conflict Destinations), *Emerald Publishing Limited, Leeds,* 133-149. https://doi.org/10.1108/978-1-80382-311-920221008

Chrobak, A., & Cebulski, D. (2014). Geotourism on landslides as a new way of education about mass processes. *GeoJournal of Tourism and Geosites,* 13(1), 26–34.

Coops, N. C., Shang, C., Wulder, M. A., White, J. C., & Hermosilla, T. (2020). Change in forest condition: Characterizing non-stand replacing disturbances using time series satellite imagery, *Forest Ecology Management*., vol. 474.

Desai, S. & Chakurkar, E. (2020). Landslide events of Kerala, their causes and impacts: A case study of Puthumala Landslide in Wayanad District.

El Gamil, R. (2023). Natural disasters and tourism research progress: A bibliometric analysis. *GeoJournal of Tourism and Geosites*, 55(1), 120–130. https://doi.org/10.21608/thalexu.2023.233735.1110

Express Web Desk. (2024). Wayanad landslides: Here's what all happened so far. The Indian Express. https://indianexpress.com/article/india/wayanad-landslides-kerala-what-all-happened-9486281/

Faulkner, B. (2001). Towards a framework for tourism disaster management. *Tourism Management*, 22(2), 135–147. https://doi.org/10.1016/S0261-5177(00)00048-0

The Economic Times. (2024). *From 2019 floods to 2024 Wayanad landslides: Why are deadly disasters repeatedly hitting Kerala?* The Economic Times. https://economictimes.indiatimes.com/news/india/from-2019-floods-to-2024-wayanad-landslides-why-are-deadly-disasters-repeatedly-hitting-kerala/articleshow/112156535.cms?from=mdr

Gaki, E., & Koufodontis, N. I. (2022). Regional tourism resilience and recovery in times of crises. *GeoJournal of Tourism and Geosites*, 40(1), 827–838. https://doi.org/10.30892/gtg.40131-827

Gössling, S., Scott, D., & Hall, C. M. (2018). Global trends in climate change legislation and litigation: Implications for tourism. *Journal of Sustainable Tourism*, 26(1), 12–30. https://doi.org/10.1080/09669582.2017.1333263

Gurtner, Y. (2007). Crisis in Bali: Lessons in tourism recovery. The Crisis Management in the Tourism Industry, 81–97. https://doi.org/10.1079/9781845930479.0081

Haldon, J., Mordechai, L., Newfield, T. P., Chase, A. F., Izdebski, A., Guzowski, P., & Roberts, N. (2018). History meets palaeoscience: consilience and collaboration in studying past societal responses to environmental change. PNAS 115(13):3210–3218. https://doi.org/10.1073/ pnas.1716912115

Hall, C. M. (2010). Crisis events in tourism: Subjects of crisis in tourism. *Current Issues in Tourism,* 13(5), 401–417. https://doi.org/10.1080/13683500.2010.491900

Highland, L. M., & Bobrowsky, Peter, (2008). The landslide handbook—A guide to understanding landslides: Reston, Virginia, U.S. *Geological Survey Circular* 1325, 129 p.

Huang, Y. C., Tseng, Y. P., & Petrick, J. F. (2007). Crisis management planning to restore tourism after disasters: A case study from Taiwan. *Journal of Travel & Tourism Marketing*, 23(2–4), 203–221. https://doi.org/10.1300/J073v23n02_16

Hunt, K., & Menon, A. (2020). The 2018 Kerala Floods: A Climate Change Perspective. Climate Dynamics.

Issakov, Y., Aktymbayeva, A., Savanchiyeva, A., Assipova, Z., Taukebayeva, M., Moldagaliyeva, A., Burakov, M., Kai, Z., & Dávid, L. D. (2025). Opportunities and perspectives of formation of the mountain tourism cluster in Almaty agglomeration. *Geojournal of Tourism and Geosites*, 58(1), 105–118. https://doi.org/10.30892/gtg.58109-1394

Jithendra Kumar, K. (2023). Investigating the Western Ghats in Kerala: An Eco-DRR approach.

Kim, J., Tang, L., & Wang, X. (2020). The Uniqueness of Entrepreneurship in the Sharing Accommodation Sector: Developing a Scale of Entrepreneurial Capital. *International Journal of Hospitality Management*, Vol.84. 102321. https://doi.org/10.1016/j.ijhm.2019.102321

Lazzari, M. (2023). Geoparks, geoheritage and geotourism: Opportunities and tools in sustainable development of the territory. *GeoJournal of Tourism and Geosites*, 56(2), 300–310.

Mikušová, M., & Horváthová, P. (2019). Prepared for a Crisis? Basic Elements of Crisis Management in an Organisation. *Economic Research-Ekonomska Istraživanja*, 32(1), 32 (1), 1844-1868.

Miles, M. B., Huberman, A. M., & Saldana, J. (2020). Qualitative Data Analysis: A Methods Sourcebook. Los Angeles: *Sage Publications.*

Mokhtari, M., & Hattab, S. (2025). The impact of climate on the comfort of tourists in the Algerian desert - The case of Adrar state, Algeria. *Geojournal of Tourism and Geosites*, 58(1), 275–283. https://doi.org/10.30892/gtg.58124-1409

Narain, S. (2024). Who is responsible for Wayanad? ,https://www.downtoearth.org.in/ natural-disasters/who-is-responsible-for-wayanad

National Remote Sensing Centre. (2024). Landslide impact map: Chooralmala, Wayanad district, Kerala [PDF]. Indian Space Research Organisation. https://www.nrsc.gov.in/sites/default/files/pdf/DMSP/Charter_1029_VAP_2_31july2024.pdf

New Indian Express (2024). Deadly Wayanad landslides: Warnings from ignored Madhav Gadgil-panel report back in limelight, https://www.newindianexpress.com/ states/kerala/2024/Jul/30/deadly-wayanad-landslides-warnings-from-ignored-madhav-gadgil-panel-report-back-in-limelight

Outlook Web Bureau. (2023). Wayanad landslides: ISRO-NSRC satellite images show landslide impact near Chooralmala, Iruvaniphuza river. Outlook India. https://www.outlookindia.com/national/wayanad-landslides-isro-nsrc-satellite-images-landslide-impact-chooralmala-iruvaniphuza-river

Perinchery, R. I. (2024). *Essays on Information & Probabilistic Reasoning.* (Doctoral dissertation, The Florida State University).

Prideaux, B., & Cooper, M. (2002). Marketing and destination growth: A symbiotic relationship or simple coincidence? *Journal of Vacation Marketing*, 8(1), 33–51. https://doi.org/10.1177/135676670200800104

Pyke, J., Law, A., Jiang, M., & Lacy, T. D. (2018). Learning from the Locals: The Role of Stakeholder Engagement in Building Tourism and Community Resilience. *Journal of Ecotourism*, 17(3), 206-219.

Ramachandra, T. V, Setturu, B., Shivamurthy, V. Chandran, M D., & Aithal, Dr. B. (2023). Ecologically Sensitive Regions in the Western Ghats, a Biodiversity Hotspot. Indian Forester. 149. 1105-1121. https://doi.org/10.36808/if/2023/v149i11/169382

Ritchie, B. W. (2008). Tourism disaster planning and management: From response and recovery to reduction and readiness. *Current Issues in Tourism*, 11(4), 315–348. https://doi.org/10.1080/13683500802140372

Šambronská, K., Kolesárová, S., Šenková, A., & Kormaníková, E. (2025). Cooperation as one of the pillars of tourism destination management. *Geojournal of Tourism and Geosites*, 58(1), 266–274. https://doi.org/10.30892/gtg.58123-1408

Singh, M., Choudhary, P., Jain, N. K., Mishra, B., & Srivastava, A. (2023). Effect of Industrial Activities Vis-à-Vis Ecological Imbalance–Sustainability Perspective. *IEEE Engineering Management Review.* 52(1), 76-91.

Suhud, U., Allan, M., Hoo, W. C., Fitrianna, H., & Noekent, V. (2024). Towards Sustainable Volcano Tourism: Understanding Visit Intentions At Mount Anak Krakatau Through Destination Credibility and Environmental Motivation. *Geojournal of Tourism and Geosites,* 56(4), 1461–1473. https://doi.org/10.30892/gtg.56403-1317

Sukran, M. A., Kurniawan, T., Basri, H., & Furqan, A. (2025). Exploring marine tourism on sustainable development segment in Indonesia: SPAR-4-SLR. *Geojournal of Tourism and Geosites,* 58(1), 243–256. https://doi.org/10.30892/gtg.58121-1406

Sutrisno, A. D., Lee, C. H., Suhardono, S., & Suryawan, I. W. K. (2024). Empowering Communities For Sustainable Transition: Integrating Tourism With Economic and Sociodemographic Dynamics In Post-Mining Strategies. *Geojournal of Tourism and Geosites*, 55(3), 1112–1123. https://doi.org/10.30892/gtg.55312-1284

Taneja, S., Pryor, M. G., Sewell, S., & Recuero, A. M. (2014). Strategic crisis management: A basis for renewal and crisis prevention. *Journal of Management Policy and Practice*, *15*(1), 78–85. https://www.na-businesspress.com/JMPP/TanejaS_Web15_1_.pdf

Thakur, V. S., Negi, R., Dhyani, I. D., Bhatt, & Yadava, A. K. (2020). Influence of environmental factors on tree species diversity and composition in the Indian western Himalaya. *Forest Ecol.Manage,* 503, 2022. https://doi.org/119746. 10.1016/j.foreco.2021.119746

Varghese, B., & Chennattuserry, J. C. (2022). Community Resilience and Crisis Management: Stakeholders Perspective of the Tourism Industry. In: Hassan, A., Sharma, A., Kennell, J., Mohanty, P. (eds) Tourism and Hospitality in Asia: Crisis, Resilience and Recovery. *Springer,* Singapore. https://doi.org/10.1007/978-981-19-5763-5_2

Varghese, B., Chennattuserry, J. C., & Kureethara, J. V. (2022). Sinking houseboats and swaying home stays: community resilience and local impacts of COVID-19 in managing tourism crisis in Kerala. *International Journal of Tourism Cities*, 8(4), 805-819. https://doi.org/10.1108/IJTC-01-2021-0004

Varghese, B. (2016). A Strategic Evaluation on Competency of Karnataka Destinations through Destination Management Organizations. *American Journal of Industrial and Business Management*, 6, 102-108. https://doi.org/10.4236/ajibm.2016.62010

Western Ghats, UNESCO Report, (2012). https://whc.unesco.org/en/list/1342/#:~:text=Older%20than%20the%20Himalaya%20mountains,the%20Indian%20monsoon%20weather%20pattern.

Wright, A. L., Nichols, E., McKechnie, M., & McCarthy, S. (2013). Combining Crisis Management and Evidence-Based Management: The Queensdale Floods as a Teachable Moment. *Journal of Management Education*, 1(2), 35 (1), 135-160.

Yadav, C. S., Gupta, P., & Lama, R. (2018). Potential of Homestays as Tourism Product in Sikkim. Sikkim: Indian Institute of Tourism and Travel Management. https://www.unep.org/topics/fresh-water/disasters-and-climate-change/climate-change-and-water-related-disasters

Yangm, B., Qin, C., Bräuning, A., Osborn, T. J., Trouet, V., Ljungqvist, F. C., Stenseth, N. C. (2021). Long-term decrease in Asian monsoon rainfall and abrupt climate change events over the past 6,700 years. PNAS 118(30):e2102007118. https://doi.org/10.1073/pnas.2102007118

Zhou, L., & Ramli, R. (2025). Factors influencing the visitor satisfaction of intangible cultural heritage museums in China: A cross-sectional quantitative study. *GeoJournal of Tourism and Geosites*, 58(1), 501–511. https://doi.org/10.30892/gtg.58147-1432

Ziari, K., & Mosleh, L. (2025). Enhancing environmental sustainability through sustainable urban tourism: Case study of Northern Tehran, Iran. *GeoJournal of Tourism and Geosites*, 58(1), 492–500. https://doi.org/10.30892/gtg.58146-1431

https://thewire.in/environment/climate-change-intensified-rainfall-that-triggered-wayanad-landslides

https://www.voanews.com/a/study-finds-rains-that-led-to-deadly-indian-landslides-were-made-worse-by-climate-change-/7742092.html

Article history: Received: 25.02.2025 Revised: 28.05.2025 Accepted: 20.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1327-1337
DOI 10.30892/gtg.602spl28-1504

MODELING TOURISTS' INTENTION AND INFORMATION SEARCH BEHAVIOR IN VIRTUAL TOUR TECHNOLOGY: INSIGHTS FROM PHRA PATHOM CHEDI TEMPLE

Bulan KULAVIJIT [1], Wirapong CHANSANAM [1*]

[1] Khon Kaen University, Department of Information Science, Faculty of Humanities and Social Sciences, Khon Kaen, Thailand; bulan.k@kkumail.com (B.K.) wirach@kku.ac.th (W.C.)

Citation: Kulavijit, B., & Chansanam, W. (2025). Modeling tourists' intention and information search behavior in virtual tour technology: Insights from Phra Pathom Chedi temple. *Geojournal of Tourism and Geosites*, 60(2spl), 1327–1337. https://doi.org/10.30892/gtg.602spl28-1504

Abstract: Tourism plays a vital role in Thailand's economy, necessitating innovative approaches to meet the evolving expectations of modern travelers. Virtual reality (VR) technology has become a transformative tool in tourism, offering immersive and accessible experiences that transcend geographical and temporal constraints. This study investigates tourists' intentions to use virtual tour technology at Phra Pathom Chedi Temple, a major historical and religious site in Nakhon Pathom Province, Thailand. The aim is to explore how such technology can enhance information search behavior and support cultural heritage dissemination. A quantitative research design was adopted, utilizing a validated questionnaire to collect data from 400 tourists. The study integrates the Technology Acceptance Model (TAM) with the Information Search Process (ISP) framework to examine five key latent variables: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude (ATT), Behavioral Intention to Use (BITU), and Information Search Behavior (ISB). Structural Equation Modeling (SEM) was employed for hypothesis testing and model evaluation. The results reveal that PU and PEOU significantly influence tourists' attitudes toward virtual tours. ATT positively affects BITU, which in turn strongly predicts ISB. These findings emphasize the central role of tourists' perceptions and attitudes in shaping their engagement with virtual tour technologies. The study highlights the importance of user-centered design and perceived benefits in promoting the adoption of virtual tours. The insights gained can guide tourism stakeholders and developers in creating more effective, engaging, and educational virtual tour systems for cultural and religious destinations, ultimately enhancing the digital tourism experience and fostering broader access to cultural knowledge. These findings improve digital tourism experiences, particularly for cultural and historical sites.

Keywords: Intention to Use Information, virtual tour, Phra Pathom Chedi Temple, Nakhon Pathom Province, digital humanities

* * * * * *

INTRODUCTION

Thailand is considered a land where Buddhism has prospered and been preserved through generations. Throughout history, numerous temples and Buddha images have been built as expressions of Buddhist faith and devotion, showcasing the value of Thai architecture, art, and history. These elements have merged with Thai traditions and culture to become part of the national identity. Temples serve as centers for transmitting morality, ethics, culture, and various traditions to the people (Phrakhrsangkharakanurak & Yotkaeo, 2017). They are also educational sites for Buddhist tourism and religious places that preserve Buddhist knowledge, allowing visitors to learn about the history of religious sites, revered Buddha images, and sacred objects. Visitors can study Buddhist principles, customs, and traditions and explore the architecture, sculptures, and paintings within religious structures such as pagodas, temples, ordination halls, sala kan parian, trai halls, and bell towers. As a result, temples have become important tourist attractions and learning centers, drawing large numbers of both Thai and foreign visitors seeking knowledge and spiritual relaxation (Ruangmanee et al., 2022).

Phra Pathom Chedi Ratcha Wora Maha Wihan Temple in Nakhon Pathom Province is a first-class royal temple and the most visited tourist attraction in Nakhon Pathom Province, with 87 percent of tourists visiting (Sangraksa, 2011). The temple contains many ancient sites and artifacts that are valuable cultural resources in terms of history and archaeology. Phra Pathom Chedi was built when missionaries of King Ashoka the Great traveled to spread religion to Suvarnabhumi (Khamtrong, 2021). Research studies related to Buddhist learning centers for tourism have found that most Buddhist learning centers have weaknesses in providing important information about their temples. There is a shortage of staff and tour guides, resulting in tourists lacking knowledge about the temple's significance. The information in brochures is insufficient to educate tourists adequately (Nittayachit & Tassanapak, 2017). It is observed that modern tourists prefer to search for information to plan their trips in advance via the Internet, including content, characteristics, sources, and search methods (Dawloomchan, 2020). Therefore, temples, as sources of Buddhist learning for tourism, should utilize virtual reality technology to enhance learning and tourism resources. This will improve access to existing information, aligning with the 3rd National Tourism Development Plan (2023-2027), which aims to upgrade

* Corresponding author

tourism experiences by providing virtual previews to tourists before they decide to travel. The plan promotes the use of virtual reality technology in tourism, called Virtual Tour, to provide knowledge, disseminate information to tourists, and share Thai culture and identity with a global audience (National Tourism Board, 2022).

Virtual tours represent an emerging trend in tourism promotion and destination marketing. These digital experiences enable access to environmentally or culturally sensitive sites where physical visitation may be restricted or inappropriate. Furthermore, they serve as comprehensive information platforms that facilitate pre-travel decision-making processes by providing immersive experiences and detailed destination insights. The advantages of virtual tourism include unrestricted temporal access, multi-destination exploration capabilities, customizable duration of visits, and experiential learning opportunities that closely simulate physical presence at the destination. This modality also offers practical benefits such as elimination of travel time and associated costs, including entrance fees (Office of Knowledge Management and Development, 2023). To develop effective virtual tours that meet tourist information needs, this research integrates the Technology Acceptance Model (TAM) developed by Davis, Bagozzi, and Warshaw, examining four key constructs: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude (ATT), and Behavioral Intention to Use (BITU).

The theoretical framework is further enhanced by incorporating the Information Search Process (ISP) model and building upon Dawloomchan's research methodology. This integrated approach is employed to analyze tourists' behavioral intentions regarding virtual tour adoption at Phra Pathom Chedi Temple in Nakhon Pathom Province. This study explored tourists' intentions to engage with information presented through a virtual tour of Phra Pathom Chedi Temple, one of the most revered Buddhist landmarks in Nakhon Pathom Province, Thailand. The research specifically sought to assess the user acceptance of virtual tour technologies and their potential to serve as practical, interactive, and widely accessible tools for Buddhist education. By examining how virtual tour systems can support disseminating knowledge related to Buddhist cultural heritage, the study contributes to promoting cultural appreciation and digital engagement in religious tourism contexts.

LITERATURE REVIEW

The theory of behavioral intention to use

Behavioral intention to use represents an individual's formulated plan to perform or not perform a specific action, with such intentions serving as key determinants of future behavior. This construct has been extensively employed in predicting technology adoption decisions (Venkatesh et al., 2006). The Technology Acceptance Model (TAM), developed by Davis, Bagozzi, and Warshaw, examines the critical factors influencing users' acceptance of innovative technologies. The model posits two primary determinants that directly affect technology acceptance: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). These core constructs influence users' attitudes toward technology, which subsequently shapes their behavioral intention to use. This behavioral intention ultimately determines the actual acceptance and utilization of the technology, as illustrated in Figure 1.

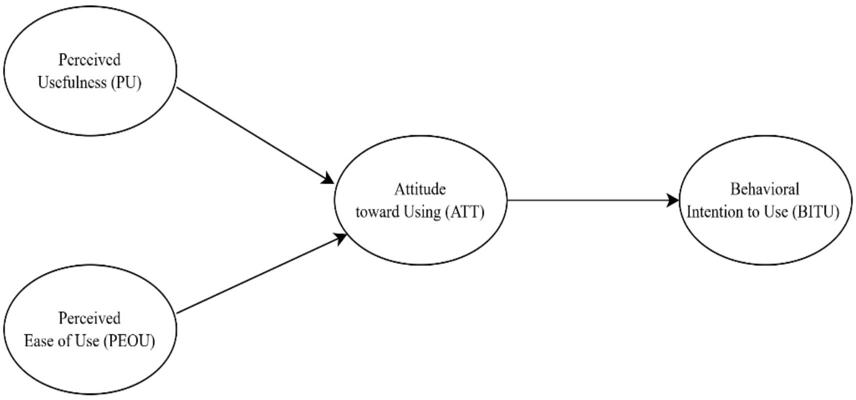

Figure 1. Technology acceptance model (Davis et al., 1989)

The Technology Acceptance Model (TAM) demonstrates that individual technology acceptance is influenced by external variables that create different perceptions for each person. These include:

Perceived Usefulness (PU) refers to the perception of benefits derived from usage, which determines individual perception. In other words, individuals recognize how technology can contribute to their personal development or performance potential. Research by Sarkady et al. (2021) and Shen et al. (2022) found that PU positively affects tourists' attitudes toward technology usage.

Perceived Ease of Use (PEOU) refers to uncomplicated usage methods that don't require extensive effort, thus enabling quick understanding. The ability to learn simple technological procedures affects technology acceptance behavior. Research by Schiopu et al. (2022) and Wu et al. (2022) found that PEOU influences tourists' attitudes toward technology usage.

Attitude toward Using (ATT) refers to individual attitudes regarding their intention to use or accept technological systems. Pallud and Straub (2014) explain that attitude means positive or negative feelings individuals have when exhibiting behavior. Their research found that museum website design positively impacts attitudes, and these positive attitudes influence visitors' intentions to revisit the website. Research by Lin et al. (2020) found that ATT affects tourists' Behavioral Intention to Use (BITU) mobile applications, while Li et al. (2024) found that ATT affects consumers' BITU mobile technology in the service and tourism industry.

Behavioral Intention to Use (BITU) refers to individual intention to use technology for accessing information. This aligns with Wilson (2000) who states that Information Search Behavior (ISB) is an individual's behavior where the searcher interacts with information systems or decides whether the found information meets their needs. Kuhlthau (2009) explains that the search process begins with accepting information as necessary and needed, involves searching for information sources and desired information, and includes using the information to meet needs.

The theory of Information search

Information search constitutes a systematic process through which individuals seek information from diverse sources. This process commences with the identification of user requirements, progresses through exploration and selection of search elements, encompasses retrieval of relevant documents, and culminates in the presentation of information. This process is facilitated by computer technology as a search instrument and utilizes the Internet as a communication medium, enabling users to conduct efficient and expeditious information searches (Numi, 2016). Kuhlthau (2009) conceptualized the Information Search Process (ISP) model, which delineates six sequential stages: 1) Initiation: Recognition and acknowledgment of information necessity; 2) Selection: Identification and determination of appropriate topics or issues as search parameters; 3) Exploration: Investigation of topic-related information and formulation of search strategies; 4) Formulation: Specification and refinement of pertinent information; 5) Collection: Systematic gathering and documentation of content-relevant information; 6) Presentation: Conclusion of the search process and preparation for information dissemination or utilization.

Furthermore, several research studies have examined information search behavior through the lens of Kuhlthau Information Search Process Theory. Kuhlthau's theory, focusing on three specific processes: data exploration, specification, and collection. Similarly, Zimmer investigated information-seeking behavior and its influence on information source selection, utilizing Kuhlthau's theoretical framework to analyze the three fundamental stages: information need recognition, information searching, and information utilization. This research demonstrated that information-seeking behavior significantly correlates with users' selection of information sources. McMullin's (2018) research applied a simplified version of Kuhlthau's theory, focusing on three specific processes: data exploration, specification, and collection. Similarly, Zimmer (2011) investigated information-seeking behavior and its influence on information source selection, utilizing Kuhlthau's theoretical framework to analyze the three fundamental stages: information need recognition, information searching, and information utilization. This research demonstrated that information-seeking behavior significantly correlates with users' selection of information sources. In a related study, the findings revealed that these tourists engage in systematic pre-trip information searching and planning, characterized by five distinct dimensions:

1) Information Content: Prioritizing specific content categories, including tourist attractions, accommodations, dining options, and transportation services (Dawloomchan, 2020; Lemy et al., 2021; Wilson, 2020).
2) Information Type: Demonstrating a preference for online platforms, particularly social media and websites, due to their accessibility, speed, and ease of use (Dawloomchan, 2020; Lemy et al., 2021).
3) Information Format: Exhibiting a strong preference for visual content, particularly images, which significantly influence destination selection decisions. Secondary preferences include textual descriptions of attractions and accommodations, transportation methodologies presented on websites, video content from YouTube, and detailed travel maps available through social media platforms and Google Maps (Daolomchan, 2020; Duong et al., 2022; Yulia, 2022).
4) Information Sources: Predominantly utilizing internet-based resources due to their accessibility, efficiency, and user-friendly nature (Daolomchan, 2020; Wu et al., 2022).
5) Information Access Strategy: Employing Google as the primary search engine and implementing keyword-based search techniques. The search terms used were namely goals, approaches, and information sources (Zarezadeh et al., 2023; Dawloomchan, 2020). This research provides valuable insights into the information search behavior of modern tourists and demonstrates the continued relevance of Kuhlthau's theoretical framework in the contemporary context.

This research uses the Technology Acceptance Model developed by Davis et al. (1989) to examine the dimensions of virtual tour usage, including perceived usefulness, perceived ease of use, attitude toward use, and intention to use. The study integrates these components with Kuhlthau's (2009) Information Search Process (ISP) Model and other researchers' research frameworks to examine tourists' intentions regarding using virtual tours at Wat Phra Pathom Chedi in Nakhon Pathom Province. The conceptual framework of this integrated approach is presented in Figure 2.

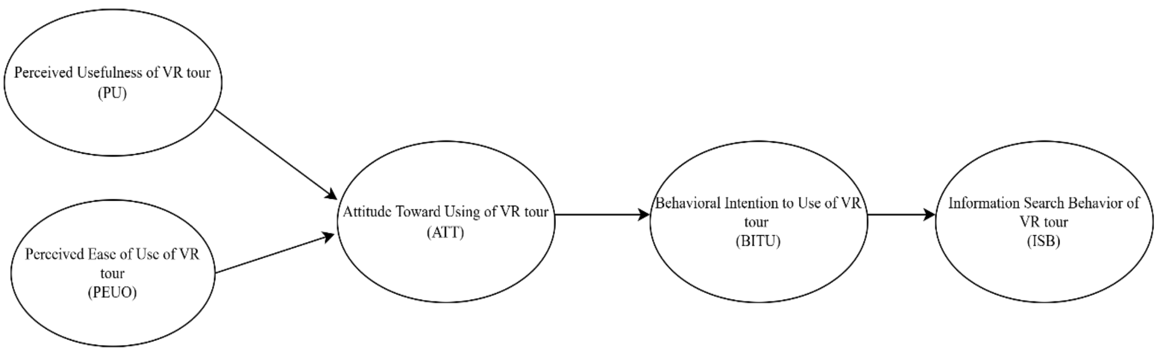

Figure 2. The conceptual framework for studying tourists' intention to use virtual tours (Source: Davis et al. 1989; Wu et al. 2022; Kuhlthau 2009; Dawloomchan, 2020; Lemy et al., 2021; Wilson, 2020; Duong et al., 2022; Yulia, 2022; Zarezadeh, 2023)

MATERIALS AND METHODS

This study employs survey research methodology with a quantitative approach to investigate tourists' behavioral intentions regarding the utilization of virtual tour information at Phra Pathom Chedi Temple in Nakhon Pathom Province.

The research population comprised tourists visiting Phra Pathom Chedi Temple. Given that the precise population size was indeterminate, the sample size was established utilizing Structural Equation Modeling (SEM) criteria, specifically following Hair et al. (2010) guidelines for determining appropriate sample sizes in structural equation modeling analysis. According to these guidelines, the recommended sample size should range between 10 and 20 times the number of observed variables. This study incorporated 18 observable variables, thus necessitating a minimum sample size between 180 and 360 participants. To ensure statistical robustness for hypothesis testing, the sample size determination adhered to Hair et al.'s criteria, specifically employing the factor of 20 times the number of observed variables. Consequently, a total sample size of 400 participants was established. The selection of participants was governed by specific inclusion and exclusion criteria. The inclusion criteria stipulated that participants must be tourists aged between 18 and 60 years, possess literacy skills, and demonstrate willingness to participate in the research. The exclusion criterion was limited to foreign tourists.

The sample was selected using simple random sampling. Questionnaires were distributed to tourists visiting Phra Pathom Chedi Temple between July 1 and September 15, 2024, until a sample size of 400 respondents was achieved.

This research is divided into two primary components. The first component involves an analysis of general tourist data. Descriptive statistical techniques, such as frequency distributions, means, percentages, and standard deviations, were employed to examine the data. Data analysis was conducted using SPSS. The second component focuses on investigating the relationships between variables. Confirmatory factor analysis (CFA) was utilized to identify the underlying latent factors explaining the relationships among the variables. Subsequently, structural equation modeling (SEM) was employed to test the research hypotheses. Data analysis for this component was carried out using AMOS v.28.

RESULTS

Descriptive statistical data analysis

A total of 400 fully completed questionnaires were collected from tourists who visited Phra Pathom Chedi Temple in Nakhon Pathom Province. The majority of respondents were female (54.75%) and male (45.25%). The largest age group was 18-24 years old (30.75%), followed by 46-60 years old (21.00%) and 37-45 years old (18.00%).

Regarding educational attainment, most respondents held a bachelor's degree (69.25%), followed by a high school/vocational certificate (15.75%) and a postgraduate degree (8.75%). In terms of occupation, the most common group was students (24.00%), followed by private sector employees (22.25%) and government employees (19.25%). Other occupations, such as housewife, farmer, unemployed, and driver, were also represented.

The majority of respondents had a monthly income of 5,001-15,000 baht (36.75%), followed by 15,001-25,000 baht (32.75%) and over 35,000 baht (15.75%). When it comes to accessing information online, mobile phones were the most commonly used device (84.50%), followed by desktop computers (8.25%) and tablets (4.75%) as illustrated in Figure 3.

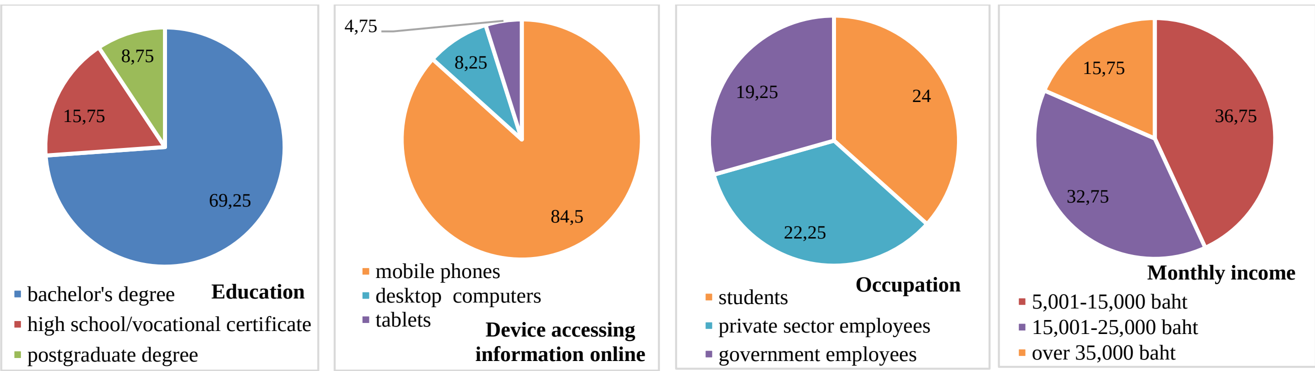

Figure 3. General information for tourists visiting Phra Pathom Chedi Temple, Nakhon Pathom Province

Confirmatory factor analysis

This study examines the model's consistency through confirmatory factor analysis (CFA) of the tourist information use intention model applied to a virtual tour of Phra Pathom Chedi Temple in Nakhon Pathom Province. The analysis incorporates five latent variables: perceived usefulness, perceived ease of use, attitude, intention to use, and information search behavior, operationalized through 18 observed variables. Employing the Reflective Measurement Model (RMM), the CFA results indicate a satisfactory fit between the model and the empirical data. Specifically, the Chi-Square statistic was 80.224 with 63 degrees of freedom and a significance level of 0.071 (>0.05), and the CMIN/df ratio was 1.273 (<2.0). Additionally, the following fit indices exceeded the recommended thresholds: the Comparative Fit Index (CFI) was 0.996 (>0.90), the Goodness-of-Fit Index (GFI) was 0.978 (>0.90), the Adjusted Goodness-of-Fit Index (AGFI) was 0.942 (>0.80), the Root Mean Square Error of Approximation (RMSEA) was 0.026 (<0.05), the Root Mean Square Residual (RMR) was 0.017 (<0.05), the Normed Fit Index (NFI) was 0.981 (>0.90), the Incremental Fit Index (IFI) was 0.996 (>0.90), and the Tucker-Lewis Index (TLI) was 0.989 (>0.90). These findings suggest that the proposed model exhibits adequate fit to the empirical data. Furthermore, the model demonstrates validity, as illustrated in Figure 4 and Table 1.

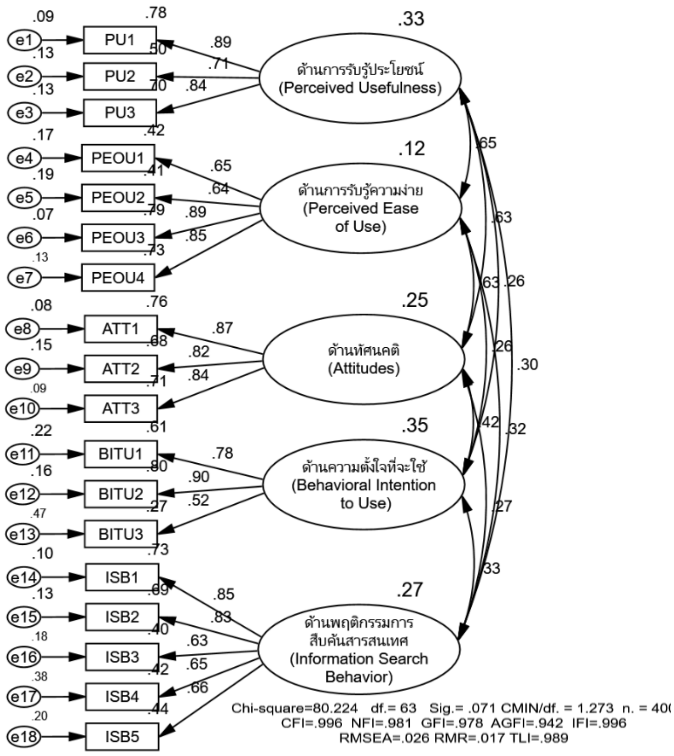

Figure 4. Factor analysis results confirmed the proposed model of tourist intention to utilize virtual tour information for Phra Pathom Chedi Temple in Nakhon Pathom Province

Table 1 presents the confirmatory factor analysis results regarding tourists' intention to use virtual tours of Phra Pathom Chedi Temple in Nakhon Pathom Province. The analysis encompassed five variables: perceived usefulness, perceived ease of use, attitude, intention to use, and information search behavior, comprising 18 observable variables. The analysis revealed coefficient weights ranging from 0.52 to 0.90, exceeding the standard threshold of 0.50 across all observable variables.

Table 1. The results of the factor analysis confirming the intention to use information of tourists in the form of virtual tours of Phra Pathom Chedi Temple, Nakhon Pathom Province as a whole (*** Statistically significant at 0.001)

Latent indicator variable	λ	SE.	t-value	R^2	AVE	CR.	Cronbach
PU				33.0%	0.665	0.855	0.853
PU 1 (Parameter constant)	0.89	-	-	79.0%			
PU2	0.71	0.04	15.993***	50.0%			
PU3	0.84	0.05	19.725***	71.0%			
PEOU				12.0%	0.586	0.847	0.853
PEOU 1 (Parameter constant)	0.65	-	-	42.0%			
PEOU2	0.64	0.08	13.177***	41.0%			
PEOU3	0.89	0.14	10.458***	79.0%			
PEOU4	0.85	0.16	10.748***	73.0%			
ATT				25.0%	0.717	0.883	0.888
ATT 1 (Parameter constant)	0.87	-	-	76.0%			
ATT2	0.82	0.06	19.826***	68.0%			
ATT3	0.85	0.05	20.935***	71.0%			
BITU				35.0%	0.562	0.786	0.760
BITU 1 (Parameter constant)	0.78	-	-	61.0%			
BITU2	0.90	0.11	12.905***	80.0%			
BITU3	0.52	0.07	10.231***	27.0%			
ISB				27.0%	0.535	0.850	0.836
ISB 1 (Parameter constant)	0.85	-	-	73.0%			
ISB2	0.83	0.09	12.215***	70.0%			
ISB3	0.63	0.06	11.639***	40.0%			
ISB4	0.65	0.09	11.579***	42.0%			
ISB5	0.66	0.06	11.756***	44.0%			

The error values ranged from 0.04 to 0.16, with multiple correlation coefficients (R^2) of individual items ranging from 27.0% to 80.0%. The multiple correlation coefficients between latent variables were between 12.0% and 35.0%, while the average variance extracted (AVE) ranged from 0.535 to 0.717, exceeding the threshold of 0.50. These results indicate strong convergent validity in the measurement model, demonstrating good variable unity (Hair et al., 2014).

The composite reliability (CR) values ranged from 0.786 to 0.855, exceeding the 0.60 threshold, while Cronbach's alpha coefficients ranged from 0.760 to 0.888, surpassing the 0.70 threshold, indicating high indicator variable reliability (Pallant, 2020). The high discriminant validity measurements demonstrated the homogeneity of latent variables, meeting all prescribed criteria. These findings confirm that both observable and latent variables in the component model effectively measured tourists' intention to use virtual tours of Phra Pathom Chedi Temple (Fornell and Larcker, 1981). The results support the incorporation of these variables into the structural equation model examining tourists' intention to use virtual tours of Phra Pathom Chedi Temple, with statistical significance at the 0.001 level.

Model analysis using Structural Equation Modeling (SEM)

To ensure consistency in both the presentation and interpretation of data analysis results, the researcher has established standardized symbols and their corresponding definitions to represent the statistical values and variables employed in the analysis. These are presented in Table 2.

Table 2. Distribution of latent variables, observed variables, and abbreviation definitions

Latent variables	Observable variables	Abbreviation
Perceived Usefulness (PU)	Assistance with travel planning	PU1
	Helping to provide the desired information	PU2
	Helping to improve access to resources	PU3
Perceived Ease of Use (PEOU)	Easy-to-understand information	PEOU1
	Reliable information	PEOU2
	Interesting information	PEOU3
	Complete information	PEOU4
Attitudes (ATT)	Good idea	ATT1
	Smart idea	ATT2
	The idea that gave me new experiences	ATT3
Behavioral Intention to Use (BITU(	You want to use the virtual tour system in the future.	BITU1
	You want to use the virtual tour system to learn about Buddhism.	BITU2
	You will recommend others to use the virtual tour system.	BITU3
Information Search Behavior (ISB)	Information search objectives	ISB1
	Content scope	ISB2
	Information characteristics	ISB3
	Information sources	ISB3
	Search strategies	ISB4

Based on the identification of latent and observed variables in this study, the structural equation model was designed as illustrated in Figure 5. From the structural equation modeling design, the following hypotheses were established:

H1: Perceived usefulness of using virtual tours affects tourists' attitude towards using virtual tours.
H2: Perceived ease of using virtual tours affects tourists' attitude towards using virtual tours.
H3: Attitude towards using virtual tours affects tourists' intention to use virtual tours.
H4: Intention to use virtual tours affects tourists' information search behavior.

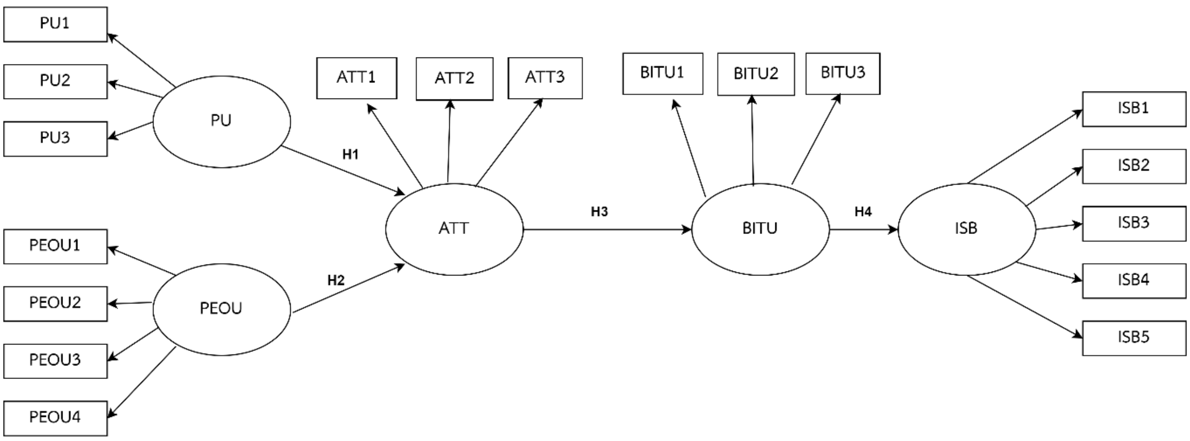

Figure 5. Structural equation modeling of tourist's intention to use information in virtual tour format of Phra Pathom Chedi Temple, Nakhon Pathom Province

This section presents the structural equation modeling (SEM) analysis of tourists' intentions to use virtual tour information of Phra Pathom Chedi Temple in Nakhon Pathom Province. The analysis encompasses five latent variables: perceived usefulness, perceived ease of use, attitude, behavioral intention, and information search behavior, comprising a total of 18 observed variables. The initial model did not meet the specified criteria; therefore, error covariances between variables were adjusted using Modification Indices across 47 paths. The results of these modifications are presented in Table 3.

Table 3. The results of model modification (modification indices) in developing a structural equation model of tourists' intentions to use virtual tour information at Phra Pathom Chedi Temple, Nakhon Pathom Province

NO.	Path			MI	NO.	Path			MI
1	e19	<-->	e20	0.141	24	e2	<-->	e17	-0.042
2	e23	<-->	e19	0.078	25	e1	<-->	e11	-0.022
3	e23	<-->	e20	0.041	26	e9	<-->	e13	0.060
4	e1	<-->	e6	-0.020	27	e3	<-->	e17	0.029
5	e1	<-->	e8	-0.030	28	e7	<-->	e15	0.025
6	e5	<-->	e6	-0.041	29	e10	<-->	e18	0.021
7	e4	<-->	e7	-0.034	30	e17	<-->	e15	0.105
8	e5	<-->	e10	-0.031	31	e3	<-->	e10	0.028
9	e6	<-->	e10	0.024	32	e3	<-->	e13	0.042
10	e6	<-->	e8	0.033	33	e2	<-->	e18	-0.020
11	e6	<-->	e9	-0.025	34	e18	<-->	e17	0.056
12	e6	<-->	e7	-0.060	35	e7	<-->	e17	-0.047
13	e2	<-->	e4	0.023	36	e4	<-->	e9	-0.023
14	e6	<-->	e11	0.046	37	e5	<-->	e9	-0.046
15	e7	<-->	e14	0.034	38	e9	<-->	e7	-0.031
16	e8	<-->	e11	0.048	39	e17	<-->	e12	0.048
17	e8	<-->	e13	0.040	40	e16	<-->	e11	-0.023
18	e8	<-->	e15	-0.029	41	e13	<-->	e14	0.024
19	e17	<-->	e14	0.056	42	e4	<-->	e17	-0.045
20	e15	<-->	e14	0.147	43	e6	<-->	e17	-0.034
21	e10	<-->	e13	0.090	44	e2	<-->	e10	0.014
22	e10	<-->	e16	0.019	45	e5	<-->	e8	-0.024
23	e5	<-->	e17	-0.069	46	e6	<-->	e13	0.028
					47	e4	<-->	e12	-0.030

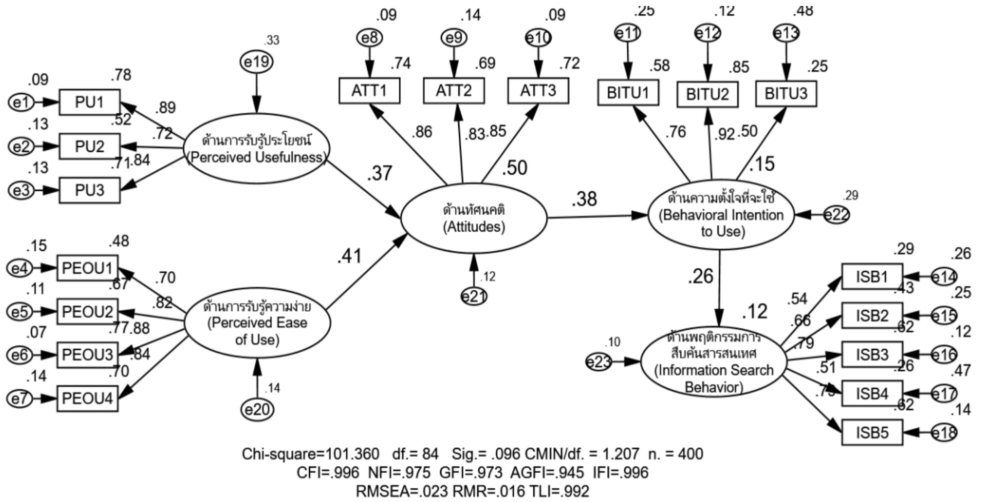

Figure 6. Structural equation modeling of tourist's intention to use information in virtual tour format of Phra Pathom Chedi Temple, Nakhon Pathom Province after using model adjustment index method

The results of the model fit indices were adjusted to develop a structural equation model examining tourists' intentions to utilize virtual tour information of Phra Pathom Chedi Temple in Nakhon Pathom Province. The empirically validated model is presented in Figure 6. From Figure 6, it can be seen that the test results after using the model fit index method passed the specified criteria, which are shown in details in Table 4. As shown in Table 4, the structural equation model of tourist information usage intention for virtual tours of Phra Pathom Chedi Temple, Nakhon Pathom Province, comprises five latent variables: perceived usefulness, perceived ease of use, attitude, intention to use, and information search behavior.

Table 4. Statistical analysis of structural equation modeling: examining tourists' intentions to use virtual tour information at Phra Pathom Chedi Temple, Nakhon Pathom Province, Using Model Fit Indices

Index	Criteria	Results	Conclusions	Reference Concepts Chi –Square = 101.360 df. = 840.
Sig.	> 0.05	0.096	Passed	Hair et al. (2010), Bollen (2014), Sorbon & Joreskog (1996)
CMIN/df.	< 2.0	1.207	Passed	Bollen (2014), Diamantopoulos & Siguaw (2000)
GFI	> 0.90	0.973	Passed	Hair et al. (2010), Browne & Cudeck (1993)
AGFI	> 0.80	0.945	Passed	Durande-Moreau an Usunier (1999), Harrison Walker (2001)
NFI	> 0.90	0.975	Passed	Hair et al. (2010), Mueller (1996)
IFI	> 0.90	0.996	Passed	Hair et al. (2010), Mueller (1996)
CFI	> 0.90	0.996	Passed	Hair et al. (2010), Suciu, Tavares & Zalmon (2018)
RMR	< 0.05	0.016	Passed	Diamantopoulos & Siguaw (2000)
RMSEA	< 0.05	0.023	Passed	Hair et al. (2010), Browne & Cudeck (1993)
TLI	> 0.90	0.992	Passed	Diamantopoulos & Siguaw (2000)

Table 5. Structural equation analysis results of modeling tourist information usage intention in virtual tour format of Phra Pathom Chedi Temple, Nakhon Pathom Province (*Statistically significant at 0.05)

Variable (path)			λ	SE.	t-value	Sig.	R^2
ATT	<--	PU	0.37	0.06	5.728	0.000*	50.0%
ATT	<--	PEOU	0.41	0.10	5.658	0.000*	50.0%
BITU	<--	ATT	0.38	0.07	6.690	0.000*	15.0%
ISB	<--	BITU	0.26	0.03	4.291	0.000*	12.0%

These latent variables are operationalized through 18 observed variables. After adjusting for measurement error using modification indices, the structural equation model demonstrated a good fit with the empirical data. The analysis results indicate that all index values are consistent with the empirical data. This suggests that the structural equation model, representing the intention to use information about Phra Pathom Chedi Temple, Nakhon Pathom Province, through a virtual tour, is accurately composed of the dimensions of perceived usefulness, perceived ease of use, attitude, intention to use, and information search behavior. In conclusion, the model aligns with the empirical data, meeting the criteria for measurement accuracy (validity) at the 0.05 significance level. The influence line test results are summarized in Table 5.

Table 5 presents the results of the structural equation model assessing the intention to use virtual tour information about Phra Pathom Chedi Temple in Nakhon Pathom Province. The model includes the variables perceived usefulness, perceived ease of use, attitude, intention to use, and information search behavior. The standardized regression coefficients range from 0.50 to 0.93, and the R^2 values for each endogenous variable range from 25.0% to 86.0%. A summary of the standardized regression coefficients for the independent variables is as follows:

1. Regarding perceived benefits, three significant variables (PU1-PU3) were identified, with coefficient weights ranging from 0.72 to 0.89 and multiple correlation coefficients (R^2) between 52.0% and 78.0%. These perceived benefits directly and indirectly impacted the structural equation model of tourists' intention to use virtual tour information for Phra Pathom Chedi Temple in Nakhon Pathom Province. The specific influences can be summarized as follows:

1.1 Direct Influence on Attitude: Perceived benefits had a significant positive direct impact on attitude, with a coefficient of 0.37, a standard error of 0.06, a t-value of 5.728, and a p-value < 0.05. This indicates a 50% change in attitude with statistical significance at the 0.05 level.

1.2 Indirect Influence on Intention to Use: Perceived benefits positively and indirectly influenced intention to use through the mediating variable of attitude, with a total coefficient of 0.14 (0.37 x 0.38).

1.3 Indirect Influence on Information Search Behavior: Perceived benefits also had a positive indirect impact on information search behavior, mediated by attitude and intention to use, with a total coefficient of 0.04 (0.37 x 0.38 x 0.26).

2. Regarding perceived ease of use, four observable variables (PEOU1-PEOU4) were identified, with coefficient weights ranging from 0.70 to 0.88 and multiple correlation coefficients (R^2) ranging from 48.0% to 77.0%. Perceived ease of use significantly influenced tourists' intention to use a virtual tour of Phra Pathom Chedi Temple in Nakhon Pathom Province through a structural equation model, exerting both direct and indirect effects. These effects can be summarized as follows:

2.1 Direct Influence: Perceived ease of use had a significant positive direct influence on attitude, with a coefficient of 0.41, a standard error of 0.10, a t-value of 5.658, and a p-value < 0.05. This indicates a 50% change in attitude due to perceived ease of use, with a statistical significance level of 0.05.

2.2 Indirect Influence on Intention to Use: Perceived ease of use had a significant positive indirect influence on intention to use through the mediating variable of attitude, with a total coefficient of 0.16 (0.41 × 0.38).

2.3 Indirect Influence on Information Search Behavior: Perceived ease of use had a significant positive indirect influence on information search behavior through the mediating variables of attitude and intention to use, with a total coefficient of 0.04 (0.41 × 0.38 × 0.26).

3. Regarding attitudes, three observable variables (ATT1-ATT3) were identified, with coefficient weights ranging from 0.83 to 0.86 and multiple correlation coefficients (R^2) between 69.0% and 74.0%. The attitude construct significantly influences the structural equation model of tourist intention to utilize virtual tour information of Phra Pathom Chedi Temple, Nakhon Pathom Province. This influence manifests in both direct and indirect pathways, as detailed below:

3.1 Direct Influence: The attitude construct exerts a significant positive direct influence on the intention to use construct, with a coefficient of 0.38, a standard error of 0.07, a t-value of 6.690, and a p-value of 0.000 (< 0.05). This indicates that a one-unit increase in attitude leads to a 0.38-unit increase in intention to use, and this effect is statistically significant at the 0.05 level.

3.2 Indirect Influence: The attitude construct also has a significant positive indirect influence on information search behavior, mediated by the intention to use construct. The total indirect effect is 0.10 (calculated as 0.41 × 0.38)

4. Intention to Use, three observable variables (BITU1-BITU4) were identified with coefficient weights ranging from 0.50 to 0.92, and multiple correlation coefficients (R^2) ranging from 85.0% to 25.0%. Intention to use directly influenced the structural equation model of tourist intention to utilize virtual tour information of Phra Pathom Chedi Temple, Nakhon Pathom Province, through a single pathway.

4.1 Direct Influence of Intention to Use: Intention to use had a significant positive direct influence on information search behavior. The coefficient was 0.26, the standard error was 0.03, the t-value was 4.291, the p-value was 0.000 (< 0.05), and the effect size was 12.0%. This indicates a statistically significant relationship at the 0.05 level.

5. In terms of information search behavior, five observable variables (ISB1-ISB5) were identified with coefficient weights ranging from 0.51 to 0.79. The multiple correlation coefficient (R^2) ranged from 26.0% to 62.0%, indicating that information search behavior, the outcome variable of the structural equation model, significantly influenced tourists' intention to use virtual tour information about Phra Pathom Chedi Temple in Nakhon Pathom Province.

Table 6 reveals that attitude is the most influential factor on the intention to use information, with a total influence coefficient of 0.38. Perceived ease follows with a coefficient of 0.16, and perceived usefulness with 0.14, resulting in a 15.0% change. Path analysis indicates that perceived usefulness and perceived ease significantly impact attitude, with coefficients of 0.37 and 0.41, respectively, contributing to a 50.0% change. Furthermore, path analysis shows that intention to use is the primary driver of information search behavior, with a coefficient of 0.26.

Attitude follows with a coefficient of 0.10, while perceived usefulness and perceived ease have a combined coefficient of 0.04, leading to a 12.0% change with statistical significance at the 0.05 level. Table 7 presents the structural equation model analysis of tourists' intention to use virtual tour information about Phra Pathom Chedi Temple in Nakhon Pathom Province. The model includes the following dimensions: perceived usefulness, perceived ease of use, attitude, intention to use, and information search behavior. The results of the hypothesis testing are summarized below:

H1: The test results support Hypothesis H1, indicating that perceived usefulness of virtual tours significantly influences tourist attitudes toward their use. The path coefficient of 0.37 signifies a moderate effect, accounting for 50.0% of the variance in tourist attitudes at the 0.05 significance level.

H2: The test results provide empirical support for Hypothesis H2, demonstrating that perceived ease of use of virtual tours has a significant positive impact on tourists' attitudes toward using them. The path coefficient of 0.41 indicates a moderate effect size, accounting for 50.0% of the variance in tourists' attitudes at the 0.05 significance level.

H3: The test results support Hypothesis H3, indicating that virtual tour attitude significantly influences tourists' intention to use virtual tours. The path coefficient of 0.38 suggests a moderate positive relationship between these variables, accounting for 15.0% of the variance in intention to use virtual tours at the 0.05 significance level.

H4: The test results support Hypothesis 4, which posits that the intention to use virtual tours influences tourists' information-seeking behavior. The path coefficient of 0.26 indicates a statistically significant effect of 12.0% at the 0.05 level.

Table 6. The results of the structural equation influence line analysis on the intention to use information of tourists in the form of virtual tours at Phra Pathom Chedi Temple, Nakhon Pathom Province

Variable	Influence	ATT	BITU	ISB
PU	Direct	0.37	-	-
	Indirect	-	0.14	0.04
	Overall	0.37	0.14	0.04
PEOU	Direct	0.41	-	-
	Indirect	-	0.16	0.04
	Overall	0.41	0.16	0.04
ATT	Direct	-	0.38	-
	Indirect	-	-	0.10
	Overall	-	0.38	0.10
BITU	Direct	-	-	0.26
	Indirect	-	-	-
	Overall	-	-	0.26
R^2		50.0%	15.0%	12.0%

Table 7. Summary of the results of the structural equation model hypothesis testing on tourists' intention to use information in the form of virtual tours of Phra Pathom Chedi Temple, Nakhon Pathom Province

Hypothesis		Result	Influence	Path	Coefficient	R^2
H1	**Perceived usefulness of using virtual tours affects tourists' attitude towards using virtual tours.**	accept	direct	positive	0.37	50.0%
H2	**Perceived ease of using virtual tours affects tourists' attitude towards using virtual tours.**	accept	direct	positive	0.41	50.0%
H3	**Attitude towards using virtual tours affects tourists' intention to use virtual tours.**	accept	direct	positive	0.38	15.0%
H4	**Intention to use virtual tours affects tourists' information search behavior.**	accept	direct	positive	0.26	12.0%

DISCUSSION

The researcher conducted a structural equation modeling analysis to examine the factors influencing tourists' intention to utilize a virtual tour of Phra Pathom Chedi Temple in Nakhon Pathom Province. The findings revealed that perceived usefulness and perceived ease of use significantly impacted tourists' attitudes toward the virtual tour. Furthermore, a positive relationship was observed between attitude and intention to use the virtual tour, which, in turn, influenced tourists' information-seeking behavior. The specific details are as follows:

Perceived Usefulness (PU) significantly influences tourists' attitudes toward utilizing virtual tours. The results of this study support Hypothesis H1, aligning with the findings of Sarkady et al. (2021) and Shen et al. (2022), which demonstrate that Perceived Usefulness (PU) positively impacts tourists' attitudes toward technology adoption. During and even post-crisis events like the COVID-19 pandemic, tourists recognize the advantages of virtual tours, leading to a favorable attitude toward using them for virtual travel and mitigating the impact of travel restrictions (Zhang et al., 2022).

Perceived Ease of Use (PEOU) influences tourists' attitudes toward utilizing virtual tours. The findings of this study support hypothesis H2, aligning with the research of Schiopu et al. (2022) and Wu et al. (2022), who demonstrated that perceived ease of use (PEOU) impacts tourists' attitudes toward technology adoption. This suggests that tourists perceive virtual reality as an easy-to-learn and adaptable tool for exploring their desired destinations.

Attitude Toward Using (ATT) virtual tours significantly influences tourists' intention to engage with them. The results of this study support hypothesis H3, aligning with the findings of Lin et al. (2020), who demonstrated that ATT impacts tourists' inclination to utilize mobile applications, and Li et al. (2024), who revealed that ATT affects consumers' propensity to employ mobile technology within the hospitality and tourism sector. As explicated by Pallud & Straub (2014), attitude encapsulates an individual's positive or negative sentiments toward a particular behavior. The research indicates that the design of the museum's website exerts a positive influence on visitor attitudes, which, in turn, positively impacts their intention to revisit the website. Additionally, it was discovered that Behavioral Intention to Use (BITU) significantly influences tourists' information search behavior (Suhud et al., 2025). This study supports Hypothesis 4, aligning with Wilson's assertion that Information Search Behavior (ISB) encompasses individuals' actions of seeking, interacting with, and evaluating information systems to determine their suitability (Tuamsuk et al., 2016).

Similarly, Lin et al. (2020) posited that BITU impacts tourists' information search behavior within application contexts. In the contemporary digital era, modern travelers extensively utilize diverse online platforms to acquire information both prior to and during their journeys, as well as to share their experiences post-trip. Consequently, internet-based information sources, including search engines and social media, have gained substantial importance in shaping tourists' travel planning processes. Furthermore, advancements in information and communication technologies have revolutionized online travel information search behavior, concurrently enriching the information context. For instance, virtual travel communities (VTCs) have emerged as effective channels for obtaining informal information, such as firsthand travel experiences and recommendations from fellow travelers. Notably, the integration of virtual reality technology into virtual tours has the potential to foster a sense of engagement and motivation among tourists through immersive virtual experiences.

CONCLUSION

This research investigates the factors influencing tourists' intention to use a virtual tour of Phra Pathom Chedi Temple in Nakhon Pathom Province. The findings highlight the significant impact of Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude Toward Using (ATT), and Behavioral Intention to Use (BITU) on Information Search Behavior (ISB), a crucial determinant of tourists' needs and intentions regarding virtual tour technology. Furthermore, the study provides valuable insights into tourists' information search behavior, enabling the analysis and design of a virtual tour system that aligns with user needs and maximizes efficiency for the target audience.

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

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Institutional Review Board Statement: Data were collected using a questionnaire approved by the Human Research Ethics Committee of Khon Kaen University on February 8, 2024 (permission number HE673011). The sample was selected using simple random sampling. Questionnaires were distributed to tourists visiting Phra Pathom Chedi Temple between July 1 and September 15, 2024, until a sample size of 400 respondents was achieved.

Informed Consent Statement: Obtained.

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

Acknowledgments: We greatly appreciate the valuable contributions of all our participants at Phra Pathom Chedi Temple, who helped complete this work.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Bollen, K. A. (2014). *Structural equations with latent variables*, John Wiley & Sons, New York.

Browne, M. W., & Cudeck, R. (1993). *Alternative ways of assessing model fit.* Testing structural equation models, 136-162, Sage, Newbury Park, CA.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science,* 35(8), 982–1003.

Dawloomchan, P. (2020). *พฤติกรรมการแสวงหาสารสนเทศของนักท่องเที่ยวไทยเจเนเรชันวาย [Information seeking behavior of Thai Generation Y tourists],* Master Thesis, Srinakharinwirot University, Thailand.

Diamantopoulos, A., & Siguaw, J. A. (2000). *Introduction to LISREL: A guide for the Uninitiated,* SAGE, London.

Duong, L. H., Phan, Q. D., Nguyen, T. T., Huynh, D. V., Truong, T. T., & Duong, K. Q. (2022). Understanding Tourists' Behavioral Intention and Destination Support in Post-pandemic Recovery: The Case of the Vietnamese Domestic Market. *Sustainability,* 14(16), 9969. https://doi.org/10.3390/su14169969

Durande-Moreau, A., & Usunier, J. (1999). Time Styles and the Waiting Experience: An Exploratory Study. *Journal of Service Research*, *2*(2), 173-186.

Fornell, C., & Larcker, D. F. (1981). Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. *Journal of Marketing Research*, *18*(3), 382-388.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson R. E. (2010). *Multivariate Data Analysis*, Pearson Prentice Hall, New Jersey.

Hair, J. F., Sarstedt, M, Hopkins, L., & Kuppelwieser, V.G. (2014). Partial Least Squares Structural Equation Modeling (PLS-SEM): An Emerging Tool in Business Research. *European Business Review*, *26*(2), 106-121.

Harrison-Walker, L. J. (2001). The measurement of word-of-mouth communication and investigation of service quality and customer commitment as potential antecedents. *Journal of Service Research*, *4(*1), 60-75.

Khamtrong, Somlux. (2021). *พิพิธภัณฑสถานแห่งชาติ พระปฐมเจดีย์[Phra Pathom Chedi National Museum]*, Public Relations and Public Relations Group, Fine Arts Department, Bangkok.

Kuhlthau, C. C. (1993). A principle of uncertainty for Information seeking. *Journal of Documentation, 49*(4), 339-355.

Kuhlthau, C. C. (2009). *Information search process.* https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=cbca92070d1975 494696f342b4e2e163b2b171dd

Lemy, D. M., Pramezwary, A., Juliana, Pramono, R., & Qurotadini, L. N. (2021). Explorative study of tourist behavior in seeking information to travel planning. *International Journal of Sustainable Development and Planning*, 16(8), 1583-1589. https://doi.org/10.18280/ijsdp.160819

Li, F., Dan, Z., & Kim, P. B. (2024). The Technology Acceptance Model and Hospitality and Tourism Consumers' Intention to Use Mobile Technologies: Meta-Analysis and Structural Equation Modeling. *The Cornell Hospitality Quarterly,* 65(4), 461-477. https://doi.org/10.1177/19389655241226

Li, R. & Pan, B. (2019). *Research on Online Travel Search Behavior :Where are We Now?* https//:www.researchgate.net/publication/355470698

Lin, S. Y., Juan, P. J., & Lin, S. W. (2020). A tam framework to evaluate the effect of smartphone application on tourism information search behavior of foreign independent travelers. *Sustainability*, *12*(22), 9366. https://doi.org/10.3390/su12229366

McMullin S. L. (2018). *The correlation between information literacy and critical thinking of college students: an exploratory stud*y, Doctoral dissertation, University of North Texas, USA.

Mueller, R. O. (1996). *Confirmatory factor analysis*. In Basic principles of structural equation modeling: An introduction to LISREL and EQS (pp. 62-128). Springer-Verlag, New York.

National Tourism Board. (2022). *แผนพัฒนาการท่องเที่ยวแห่งชาติ ฉบับที่)3 พ.ศ2570-2566.)([National Tourism Development Plan No. 3 (2023-2027)],* Ministry of Tourism and Sports, Bangkok, Thailand.

Nittayachit, P., & Tassanapak, T. (2017). **ศึกษาการจัดการองค์ประกอบการท่องเที่ยววิถีพุทธอย่างยั่งยืนจังหวัดกาฬสินธุ์** [Study of sustainable management of Buddhist tourism components in Kalasin Province]. *Academic Journal, Faculty of Management Science, Maha Sarakham University*, 2(4), 7-24.

Numi, A. (2016). *เอกสารประกอบการสอนรายวิชาการค้นคืนสารสนเทศออนไลน์[Teaching materials for the online information retrieval course]*, Faculty of Humanities and Social Sciences, Rajabhat Bansomdejchaopraya University, Bangkok, Thailand.

Office of Knowledge Management and Development (Public Organization). (2021). *เที่ยววิถีใหม่ แบบ VIRTUAL TOURS* [*New way of travel, VIRTUAL TOURS]*. https://www.okmd.or.th/okmd-kratooktomkit/4112/

Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS,* Allen & Unwin, Australia.

Pallud, J., & Straub, D. W. (2014). Effective website design for experience-influenced environments: The case of high culture museums. *Information & Management,* 51(3), 359–373.

Phrakhrsangkharakanurak thirasok, & Yotkaeo, P. (2017). **อัตลักษณ์การท่องเที่ยวทางพระพุทธศาสนา :ตัวชี้วัดและแนวปฏิบัติเพื่อความยั่งยืนตามวิถีพุทธ** [Buddhist Tourism Identity: Indicators and Practices for Sustainability in the Buddhist Way]. *Journal of Graduate Studies*, 13(1), 256-267.

Ruangmanee, P., Phochakon, P., & Phongsuwan, P. (2022). **นโยบายการจัดการท่องเที่ยวเชิงพุทธธรรมในเขตพัฒนาพิเศษภาคตะวันออก** [Buddhist tourism management policy in the Eastern Economic Corridor]. *Interdisciplinary Journal of Innovation Review*, *5*(2), 149-140.

Sangraksa, Narin. (2011). *การศึกษาสภาพการณ์ของการท่องเที่ยวเชิงศิลปวัฒนธรรมในจังหวัดนครปฐม[Study of the situation of cultural tourism in Nakhon Pathom Province],* Educational Research and Development Center Silpakorn University, NakhonPathom, Thailand.

Sarkady, D., Neuburger L., & Egger, R. (2021). *Virtual Reality as a Travel Substitution Tool During COVID-19.* Paper presented at Proceedings of the ENTER 2021 eTourism Conference, January, 19–22.

Schiopu, A.F., Hornoiu, R. I., Padurean, A.M., & Nica, A. M. (2022). Constrained and virtually traveling? Exploring the effect of travel constraints on intention to use virtual reality in tourism. *Technology in Society*, 71(120469), 1-14. https://doi.org/10.1016/j.techsoc.2022.102091

Shen, S., Xu, K., Sotiriadis, M., & Wang, Y. (2022). Exploring the factors influencing the adoption and usage of Augmented Reality and Virtual Reality applications in tourism education within the context of COVID-19 pandemic. *Journal of Hospitality, Leisure, Sport & Tourism Education,* 30(June), 100373. https://doi.org/10.1016/j.jhlste.2022.100373

Sorbon, D., & Joreskog, K. (1996). *LISREL8 :User's Reference Guide*, Scientific Software International, Illinois.

Suciu, Marjorie C., Tavares, Davi C., & Zalmon, Ilana R. (2018). Comparative evaluation of crustaceans as bioindicators of human impact on Brazilian sandy beaches. *Journal of Crustacean Biology* ,*38*(4), 420-428.

Suhud, U., Allan, M., & Hoo, W. C. (2025). Destination sustainability of Ijen Geopark as perceived by tourists: how far its impact on visit intention? *Geojournal of Tourism and Geosites,* 58(1), 146–160. https://doi.org/10.30892/gtg.58113-1398

Tuamsuk, K., Kaewboonma, N., Chansanam, W., & Leopenwong, S. (2016). Taxonomy of folktales from the greater mekong sub-region. *Knowledge Organization*, 43(6), 431–439. https://doi.org/10.5771/0943-7444-2016-6-431

Venkatesh, V., Brown, S. A., Maruping, L. M., & Bala, H. (2006). Predicting different conceptualizations of system use: the competing roles of behavioral intention, facilitating conditions, and behavioral expectation. *MIS quarterly,* 32(3), 483-502. https://doi.org/10.2307/25148853

Wilson, T. D. (2020). *Exploring information behaviour an introduction*. https://informationr.net/ir/Exploring%20information%20behaviour.pdf

Wilson, T. D. (2000). Human Information Behavior. *Informing science,* 3(2), 49-55.

Wang, Y., & Fesenmaier, D. R. (2004). Towards understanding members' general participation in and active contribution to an online travel community. *Tourism Management,* 25(6), 709-722.

Wu, Y., Jiang, Q., & Ni, S. (2022). What Drives Users to Adopt a Digital Museum? A Case of Virtual Exhibition Hall of National Costume Museum. *SAGE Open,* 12(1), 1-17. https://doi.org/10.1177/21582440221082105

Yulia, Y. A., Widianto, T., Pamastutiningtyas, T. S., & Imron P. L. A. (2022). The Tourism Management Information Searching During Pandemic COVID-19. *Journal Ekonomi dan Bisnis Jagaditha*, 9(1), 57-65. https://doi.org/10.22225/jj.9.1.2022.57-65

Zarezadeh, Z. Z., Benckendorff, P., & Gretzel, U. (2023). Online tourist information search strategies. *Tourism Management Perspectives*, 48(101140). https://doi.org/10.1016/j.tmp.2023.101140

Zhang, S. N., Li, Y. Q., Ruan,W. Q., & Liu, C. H. (2022). Would you enjoy virtual travel? The characteristics and causes of virtual tourists' sentiment under the influence of the COVID-19 pandemic. *Tourism Management*, 88(2), 1-13. https://doi.org/10.1016/j.tourman.2021.104429Get rights and content

Zimmer, C.J. (2011). *Information seeking behavior: the effects of relationism on the selection of information sources.* Doctor Dissertation, Clemson University, South Carolina.

Article history: Received: 15.03.2025 Revised: 29.05.2025 Accepted: 23.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1338-1347
DOI 10.30892/gtg.602spl29-1505

CHANGES IN WINE TOURISM AND THE TRANSFORMATION OF WINE TOURISM PRODUCTS THROUGH THE EXAMPLE OF THE BEREHOVE DISTRICT IN TRANSCARPATHIA

Mária VASVÁRI [1*], Natália OLÁH [1, 2], Tibor KOVÁCS [3]

[1]University of Debrecen, Department of Landscape Protection and Environmental Geography, Debrecen, Hungary; vasvari.maria@science.unideb.hu (M.V.)
[2]Ferenc Rákóczi II. Transcarpathian Hungarian College of Higher Education, Department of Geography and Tourism, Bereghove, Ukraine and University of Debrecen, Department of Landscape Protection and Environmental Geography, Debrecen, Hungary; olah.natalia@kmf.org.ua (N.O.)
[3]Hungarian University of Agriculture and Life Sciences, Gödöllő, Hungary; Kovacs.Tibor@uni-mate.hu (T.K.)

Citation: Vasvári, M., Oláh, N., & Kovács, T. (2025). Changes in wine tourism and the transformation of wine tourism products through the example of the berehove district in Transcarpathia. *Geojournal of Tourism and Geosites*, 60(2spl), 1338–1347. https://doi.org/10.30892/gtg.602spl29-1505

Abstract: Tourism, especially wine and rural tourism, makes an important economic contribution to local communities in Transcarpathia. The wine sector is increasingly shaped by global challenges such as climate change, sustainability expectations, and the spread of digital tools. Despite these difficulties, the wine industry in the region remains an essential guardian of local traditions and cultural values. Wine festivals and wine routes have long played a central role in tourism development, although their importance has decreased significantly due to the war. The Bereg region, one of Transcarpathia's leading wine areas, is also famous for its thermal waters, cultural heritage, and unique wine culture. The area has centuries-old winemaking traditions, and the favorable local climate is ideal for quality viticulture. Historically, the wine region has been divided and reorganized several times, but since the early 2000s it has been developing steadily. Our research was based on both secondary (literature analysis) and primary (structured interviews with winemakers) data collection methods. The questionnaire included 30 closed-ended questions, and the responses were processed using statistical methods, including averages, correlations, and cross-tabulations. Microsoft programs, QGIS, and SPSS software supported the data processing, with results presented in tables and charts. Key findings show that the majority of winemakers surveyed in the Beregvidék region are men aged between 30 and 39 with higher education, whose primary income comes from winemaking. The average vineyard size is 14.2 hectares, with a predominance of white grape varieties, mainly of Hungarian and Ukrainian origin. The impacts of COVID-19 and the war have radically transformed the region's tourism and wine sales channels. While festivals and large events have disappeared, wine tastings and courier-based deliveries have become dominant. Larger estates proved more resilient in adapting to wartime conditions. Development priorities also differed by the age of wineries: younger wineries focused on infrastructure improvements and marketing, while older businesses prioritized value preservation and automation.

Keywords: wine tourism, changing product offerings, crisis management strategies, Transcarpathia

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INTRODUCTION

The development of the tourism sector in various countries has become one of the priorities of national development sectors (Sutiadiningsih et al., 2023). Tourism, a rapidly growing global sector, significantly boosts the economy, particularly in rural areas, by creating jobs and increasing local incomes. It also fosters local goods production and infrastructure that benefits the local population (Dancsokné et al., 2023:186). At the same time, tourism can be called one of the biggest victims of the COVID-19 pandemic, with the once successful sector having to record an unprecedented decline in traffic and revenue (Jáki et al., 2024). European examples also show that gastrotourism is gradually becoming an independent form of tourism, with wine routes and thematic routes being created (Kovács & Horeczki, 2024).

Wine tourism, a form of rural tourism, is a notable contributor to local economies (Kastenholz et al., 2022), with wine's cultural significance making it integral to many tourism experiences (Bene, 2019:7). Rural tourists turn out to be relaxed and hedonistic, they primarily seek facilitated consumption experiences and privacy (Darabos et al., 2024). Among tourists, the quiet, peaceful environment and the proximity to nature that helps with regeneration often feature prominently in their motivation for choosing a destination (Kinczel & Müller, 2023). The wine industry faces challenges from globalization and the rise of New World wine regions, yet it continues to diversify the global market (Morrison & Rabellotti, 2017; Kaur et al., 2019; Ljavic et al., 2023; Dudić et al., 2024). Wineries must adapt to global competition and environmental sustainability (Faria et al., 2021), as prestige is shaped by complex social, cultural, and spatial factors (Cerdá et al., 2024).

Tourism products increasingly focus on uniqueness, diversity, value for money, and personalized services (Molnár & Remenyik, 2015). Health tourism now includes vinotherapy (Molnár, 2012 – cited by Molnár & Remenyik, 2015), and

* Corresponding author

digital tools enable personalized experiences (Happ et al., 2020, Qesja & Bastian, 2023). Tourism sector is influenced and shaped by new technologies like never before. Easy and comfortable access to new tools such as chatbots, virtual assistants, online reservations, virtual tours, personalized recommendations or digitization are reshaping customer behavior (Mura & Stehlíková, 2025). Sustainable tourism, emphasizing eco-friendly and socially responsible practices, is growing (Interreg-CEETO 2018). Changing demographics and a heightened demand for safety also shape tourism services (Kiss & Kovács, 2018; Michalkó et al., 2023). Wine tourism involves visits to vineyards, wineries, festivals, and exhibitions, where wine tasting and regional experiences are central (Hall et al., 2000). It enhances a destination's image and combines rural landscapes, cultural heritage, festivals, gastronomy, and wine education (Sarkadi et al., 2000; Getz & Brown, 2006; Alebaki & Iakovidou, 2011). Environmental responsibility is key, with eco-efficient production methods gaining traction (Hofmeister et al., 2013; Bene, 2019). Direct interactions with customers via digital channels support wine tourism growth (Dudić et al., 2024).

Emerging wine regions and large consumer markets, such as China, have reshaped the global wine trade (Tessényi & Katona, 2023:213). Despite stagnating global wine consumption since 2008, the premium wine trade has grown (del Rey & Loose, 2023). The global wine trade experienced a decline in volume and value in 2023 due to reduced real incomes, post-pandemic overstocking, and shifting consumer preferences (Mueller Loose & del Rey, 2024).

Climate change affects sustainable grape cultivation (Navia-Osorio et al., 2023), with demand for low-alcohol and alcohol-free wines rising (Totth, 2021). The alcohol-free wine market is expected to grow 10% annually from 2023 to 2033 (Kucherenko & Uspalenko, 2023). Wine tourism is expanding as wine culture grows and global consumption trends evolve (Harsányi et al., 2014; Tessényi & Katona, 2023:213). Climate change is reshaping wine production, with new regions like the UK's Sussex gaining prominence (Jones et al., 2005; Admin, 2007; Hall & Sharples, 2008). Tourists, particularly Generations Y and Z, seek experiences beyond wine tasting, such as harvest opportunities and gastronomic pairings (Szmirkó, 2019). Sustainability is increasingly important, with organic farming gaining popularity (Michalkó, 2012; Dressler, 2023). Social media influences wineries to offer "Instagrammable" experiences (Harsányi et al., 2022), and virtual wine tastings have expanded reach (Lease et al., 2023). Family-friendly services and educational wine experiences are broadening the target audience (Getz & Brown, 2006; Santini et al., 2024). Transcarpathia's unique climate and landscape make it ideal for viticulture, and its position bordering four countries enhances its tourism and economic potential. Before the war, increased tourism boosted demand for local products, including wine (Kudla & Hamkalo, 2019). Small-scale producers in the region's districts (Berehovo, Irshava, Mukachevo, Vynohradiv, and Uzhhorod) focus on local economic development and preserving traditional winemaking (Kudla & Hamkalo, 2019).

The region offers significant potential for thematic wine tours, with private wineries producing wine using traditional methods (Basyuk & Muzychka, 2018). Attractions include the historic wine cellars of Serednie village, considered among Europe's best and listed by UNESCO (Basyuk & Muzychka, 2018). The Chizay winery, established in 1995 in Berehovo, produces highly demanded wines and features a tasting room and Wine and Viticulture Museum (Basyuk & Muzychka, 2018). Transcarpathia also has a wine route, developed by the Transcarpathian Private Vineyards and Winemakers Association and Uzhhorod National University (Basyuk & Muzychka, 2018). Before the war, there were several wine festivals in the region, which attracted more than 100 000 tourists a year, either on their own or as part of the gastronomic festivals (Karmacsi & Sass, 2023).

Objectives

The main objectives of our research were:

- to present the current state of grape and wine production in Ukraine, with a focus on Transcarpathia;
- to assess whether wineries in the Bereg region produce unique, distinctive products;
- to examine the effects of COVID-19 and the Russian-Ukrainian war on wine tourism in Transcarpathia and the Bereg region;
- to analyze how local winemakers responded to these challenges;
- to identify the key factors currently influencing wine tourism in the Bereg region.

MATERIAL AND METHOD

1. Presentation of the sample area

The study area – Bereg region – is located in the Berehovo district, the center of which is Berehovo, the seat of the former Bereg county (Figure 1). The main tourist attractions of the region are: thermal water, built and cultural heritage, and grape and wine culture. In Beregvidék, grape and wine production and the preservation of traditions can be a breakthrough point for tourism (Tarpai, 2013). Transcarpathia, located at the northern boundary of viticulture, has a long history of wine production. The region's climate, with 2025 hours of sunlight annually and 650-750 mm of precipitation, supports high-quality grape cultivation. The first written record of viticulture dates back to 1247. By the mid-18th century, Polish Jews dominated the wine trade in Transcarpathia. Indigenous grape varieties included Zöldboros, Furmint, and Járdavány (Lehoczky, 1881). The phylloxera plague in the late 19th century significantly reduced vineyard areas, which recovered by 1910 (Horváth, 2000). The Hungarian Ministry of Agriculture created a wine region classification in 1893, defining regions like Serednye-Vynna and Munkács-Nagyszőlős (Lehoczky, 1881). Today, these are known as the Serednye and Berehovo wine regions. The region is now divided into 12 districts, with the Bereg district being one of them (Ukraine's Vineyards Register, 2010). After the Trianon Peace Treaty of 1920, Transcarpathia was annexed from Hungary, marking the end of its first golden age. The Podkarpatska Viticulture Association was founded in the 1930s to represent producers (Horváth, 2000). Soviet rule after World War II led to a decline in viticulture, which did not recover until the 1960s. The vineyard area peaked in 1965 at 17,200 hectares, but excessive chemical use and anti-alcohol laws in the 1980s caused further decline. Post-Soviet transitions saw a slow recovery, with the Berehovo Wine Region Association forming in 2001 and the establishment of the Transcarpathian Tourism Wine Route in 2008 (Sass & Bártfai, 2016).

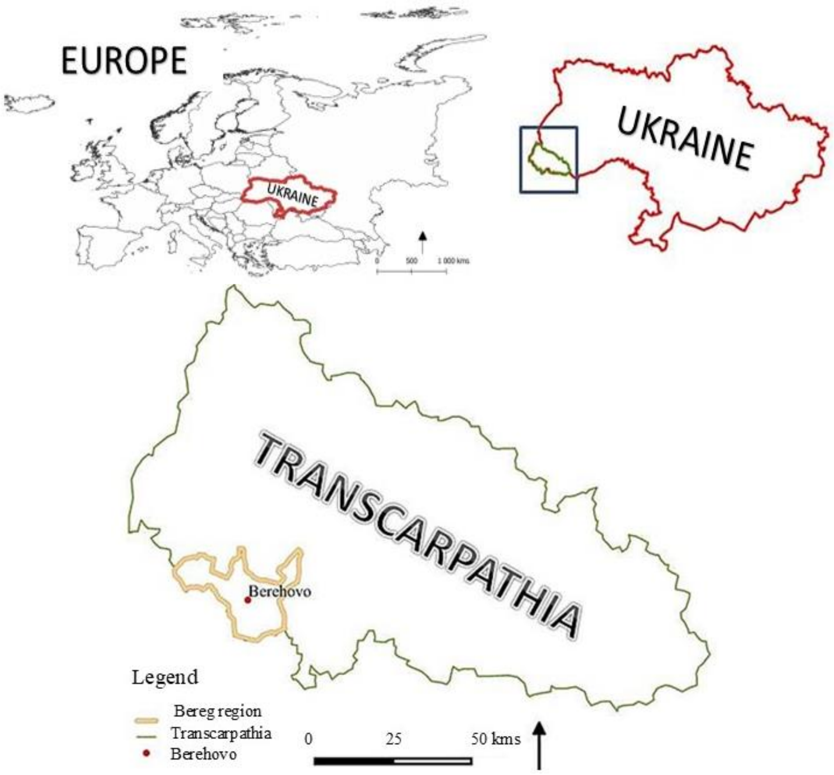

Figure 1. Presentation of the sample area (Source: Own editing)

2. Methods

The research process is illustrated in Figure 2. We used secondary and primary research methods to conduct the research. As secondary methods, the collection, study, and analysis of written sources, professional books, and scientific articles were used. As primary research, we contacted local winemakers from the fall of 2023, with whom we conducted structured interviews. Currently, there are 11 winemakers and 2 wineries in the Bereg tourism region, and our research focused on local winemakers, and the sample included 11 winemakers. The questions mainly included standardized answer options (closed questions), thus making our research method suitable for quantitative research. The pre-established structure of the questions reduces the differences that occur during the interviews, thus avoiding the risk of subjectivity, while at the same time allowing us to record useful information in the form of marginal notes. The limitation of the method lies in the fact that it is not suitable for deeper exploration of the topic. We asked 30 questions in the structured interview.

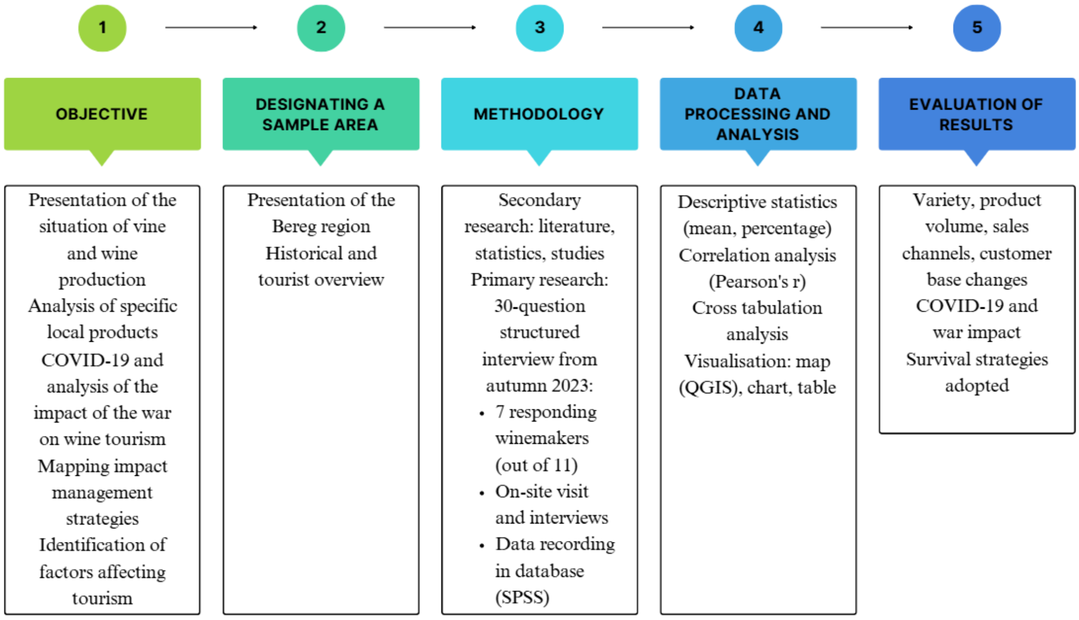

Figure 2. Study flow chart (Source: Own editing)

Our questionnaire can be divided into the following groups of questions: general socio-demographic indicators, data related to winemaking, topics of tourism and sales before and after the COVID-19 pandemic and the wartime period, the territorial distribution of visitors, and directions for development. The questions of the structured interview were organized into a database and cleaned for a more precise examination of the scientific results. To analyze the results and evaluate the data, in addition to descriptive statistics (mean, percentage distributions), we performed a correlation analysis to explore the relationships between different variables, using the Pearson correlation coefficient, and the p-value to check significance, and we also performed cross-tabulation analyses on our data. The results are presented with visual elements (tables, diagrams, maps). During the research, we used the Microsoft program package, QGIS 3.2, and IBM SPSS Statistics 20 software.

RESULT

The authors personally visited the well-known winemakers of the Beregvidék region: 7 out of 11 winemakers answered the questions posed (Figure 3 shows which settlements we were allowed to conduct our survey in). Three wineries are located in Bene (Parászka Winery, Urszta Winery, Varga Family Vineyard-Wine Cellar), two of our respondents were from Nagymuzsalyi (Bereczky Winery, Erika Winery), and one winery each was from Berehovo (Huszár Family Winery) and Kígyós (Sass Winery). The majority of the winemakers surveyed are male (71.4%), with a minimum of 11 and a maximum of 25 years of professional experience. The majority of respondents (57.1%) are between the ages of 30 and 39. 85.7% have a higher education, and winemaking is their main source of income (71.4%). This value is not surprising, since 85.7% of our respondents were owners of the facility, and there was only one respondent who summarized his answers to our questions as a winegrower. The main source of income in Ukraine, currently the poorest European country (Cherevko, 2024), provides them with an average living wage (71.4%). (The average cost of living in Ukraine, per month, average: 2022 H1: 2393 hryvnia - UAH; 2022 H2: 2508 UAH; 2023: 2589 UAH; after 1 Jan. 2024: 2920 UAH; forecast for 2024: 2972 UAH [Riabinina, 2024:8].) (1000 UAH = 9380 HUF, at the exchange rate of 28.02.2025). During the survey, we also asked whether they were engaged in other grape-related activities besides wine grape production. 85.7% of the responding wineries were engaged in table grape production in addition to wine grape production, but some were engaged in table grape sales (42.8%), grafting (42.8%), grape seed meal production (14.3%), and distillate and sparkling wine production (14.3%) (Figure 4).

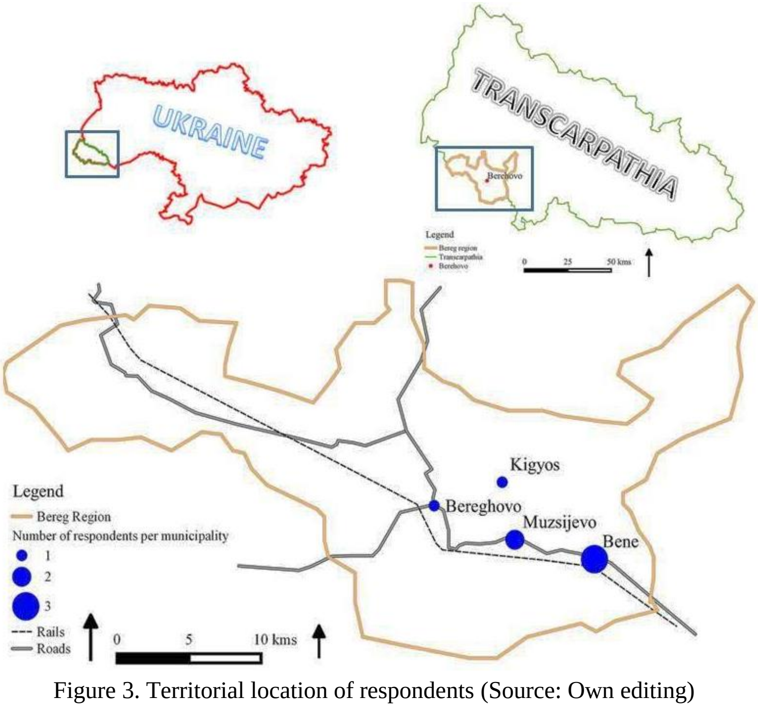

Figure 3. Territorial location of respondents (Source: Own editing)

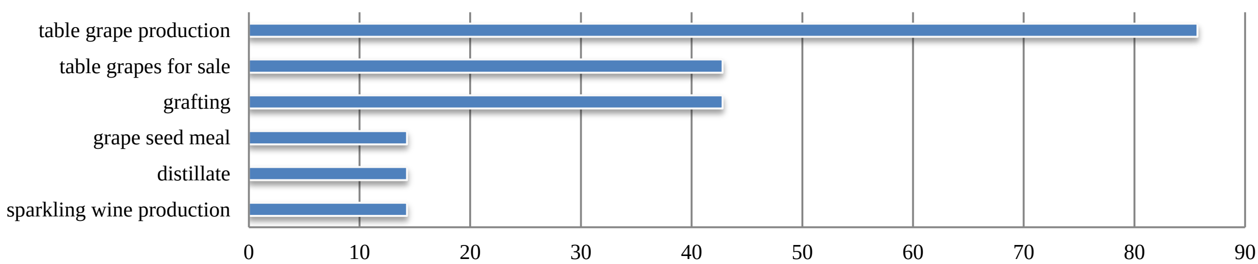

Figure 4. Other activities of winemakers besides wine grape production (%) (Source: Own editing)

The size of the wineries varies, ranging from 1.2 hectares (ha) to 25 ha; the average size is 14.2 ha, and the respondents farm a total of 99.2 ha. We looked for a correlation between the size of the estate and the activities carried out on it. There is a weak-medium correlation between the variables (r=0.403), but the relationship is not significant (p=0.370). Based on the results, it is not possible to draw a clear conclusion that there is a real relationship between the area of the winery and the engagement in other activities. On average, farmers deal with 23 types of grapes, some with only 2 varieties and some with 75 varieties. We asked the farmers to name 3 wine and table grapes, of which they produce the largest quantities. The information collected on the vineyards is included in Table 1.

Table 1. Summary table of the most produced wine and table grapes by winemakers (2023) (Source: Own editing)

Vine name	Variety	Colour	Origin	Where did it come from?	Average yield	What % of wine-growers produce
Afuz Ali	table grape	white	planted vineyard	Lebanese	13-15 t/ha	14.3
Arcadia	table grape	white	planted vineyard	Ukrainian	12-20 t/ha	28.6
White Bakator	wine grape	white	**autochthonous grape**	Hungarian	*	14.3
Cserszegi Fueszeres	wine grape	white	planted vineyard	Hungarian	9 t/ha	28.6
Furmint bianco	wine grape	white	**autochthonous grape**	Hungarian	6 t/ha	14.3
Gala	table grape	blue/red	planted vineyard	Ukrainian	*	14.3
Golubok	wine grape	blue/red	planted vineyard	Ukrainian	11,4 t/ha	28.6
Black Muscat of Alexandria	table grape	blue/red	planted vineyard	Uncertain origin	13,3 t/ha	14.3
Irsai Oliver	table and wine grapes	white	planted vineyard	Hungarian	*	14.3
Muscat Italia	table grape	white	planted vineyard	Italian	9-12 t/ha	14.3
Blaufränkisch	wine grape	blue/red	planted vineyard	Austrian	12 tonna/ha	28.6
Fetească regală	wine grape	white	planted vineyard	Romanian (Transylvanian)	10-14 t/ha	28.6
Citron Magarach	table grape	white	planted vineyard	Ukrainian	15-20 t/ha	14.3
Lora	table grape	white	planted vineyard	Ukrainian	13,8 t/ha	14.3
Moldova	table grape	blue/red	planted vineyard	Moldovan	15-16,5 t/ha	14.3
Muscat Blanc	wine grape	white	planted vineyard	French	10-14 t/ha	42.9
Nero	table grape	blue/red	planted vineyard	Hungarian	11-12 t/ha	14.3
Welschriesling	wine grape	white	planted vineyard	French	12-14 t/ha	42.9
Muscat Ottonel	table grape	white	planted vineyard	French	8-10 t/ha	28.6
Treasure of Pannonia	table grape	white	planted vineyard	Hungarian	10-14 t/ha	14.3
Pölöskei Muscat	table grape	white	planted vineyard	Hungarian	10-14 t/ha	28.6
Sauvignon blanc	wine grape	white	planted vineyard	French	11,6 t/ha	14.3
Gewürztraminer	wine grape	pink	planted vineyard	German	8-11 t/ha	14.3

* We couldn't find a reliable data source

The respondents named 23 grape varieties, 74% of which are white grapes. Among the varieties, only two can be considered indigenous to Transcarpathia: Bakator Muscat and Furmint were also indigenous to the area during the time of historical Hungary, which is why we consider them Hungarian and not Ukrainian. The prominently produced grapes were introduced from 8 different areas, 30% of which are Hungarian, while 22% come from Ukrainian territory. These percentages are a good indication of the geographical and historical situation of Transcarpathia since in this region Ukrainian and Hungarian influences also dominate in the field of viticulture.

Among the white wines, Királyleányka, Olaszrizling, Ottonel Muskotály, and pink Traminer can be considered as wines of Transcarpathia's region, among the red wines, Cabernet Sauvignon, which is listed as a world variety, or the recent discovery of the winemakers of Bereg, Golubok (Kovács, 2009). The distribution of the most produced grape varieties is shown in Figure 5, where we can see that the production of Muscat and Riesling is preferred in proportion.

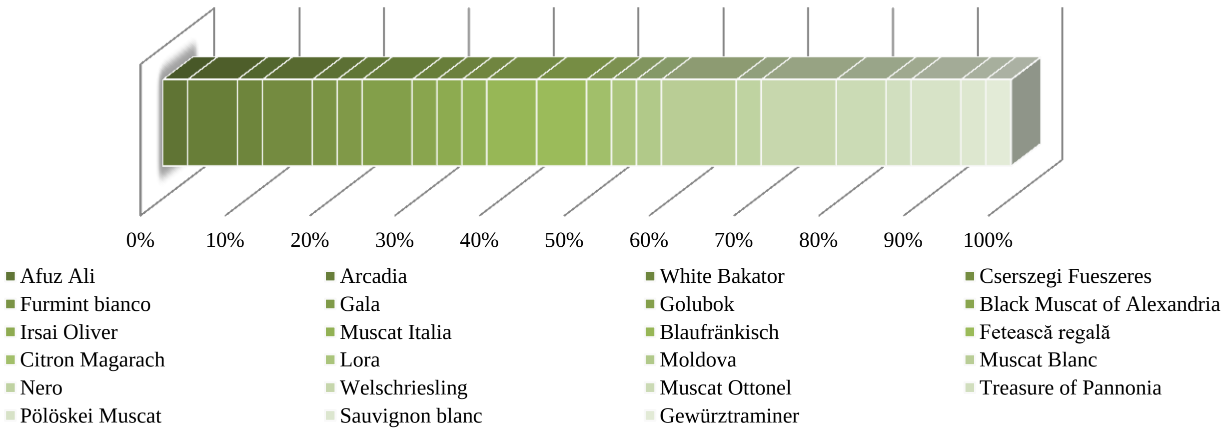

Figure 5. Distribution of the most produced grape varieties by winemakers (Source: Own editing)

The average yield of vineyards is 12 tons per hectare. Based on the average estate size and average yield, a farmer can harvest 170.4 tons of grapes, which together with the 7 respondents could mean 1192.8 tons of grapes per year.

All winemakers produce white and red wines, while six wineries produce rosé. The highest proportion of respondents' wines is dry and semi-dry wines (27%), semi-sweet (23%), sweet (18%) and the least popular category is siller, which accounts for only 5% of the wines produced. We used correlation calculations to examine whether there is a significant relationship between the length of winemaking experience and the number of grape varieties produced. The correlation was weak (r=0.126) and not statistically significant (p=0.787). Based on these results, we can conclude that there is no significant relationship between the length of winemaking experience and the number of grape varieties grown.

Next, we compared the relationship between estate size and the number of grape varieties grown. The correlation was moderately strong (r=0.541), but still not statistically significant (p=0.210). This suggests that while there is some tendency for larger estates to cultivate more grape varieties, this relationship has not been statistically proven.

Winemakers market their wines most extensively during the summer months (42%), with August being the most significant month (18%). Among the other months, December (13%) and May (13%) stand out with notable sales figures. The increased turnover during these months is likely related to winter holidays and long weekends.

According to responses regarding the clientele of wine producers, it can be observed that before the COVID-19 pandemic and the Russian-Ukrainian war, a significant portion of the visitors were domestic, with a smaller proportion of tourists from Hungary (13%) and other countries (2%). Domestic tourists usually came from Transcarpathia, Kyiv, Lviv, and Odesa regions, but they also welcomed guests from Rivne and Kharkiv regions (Figure 6).

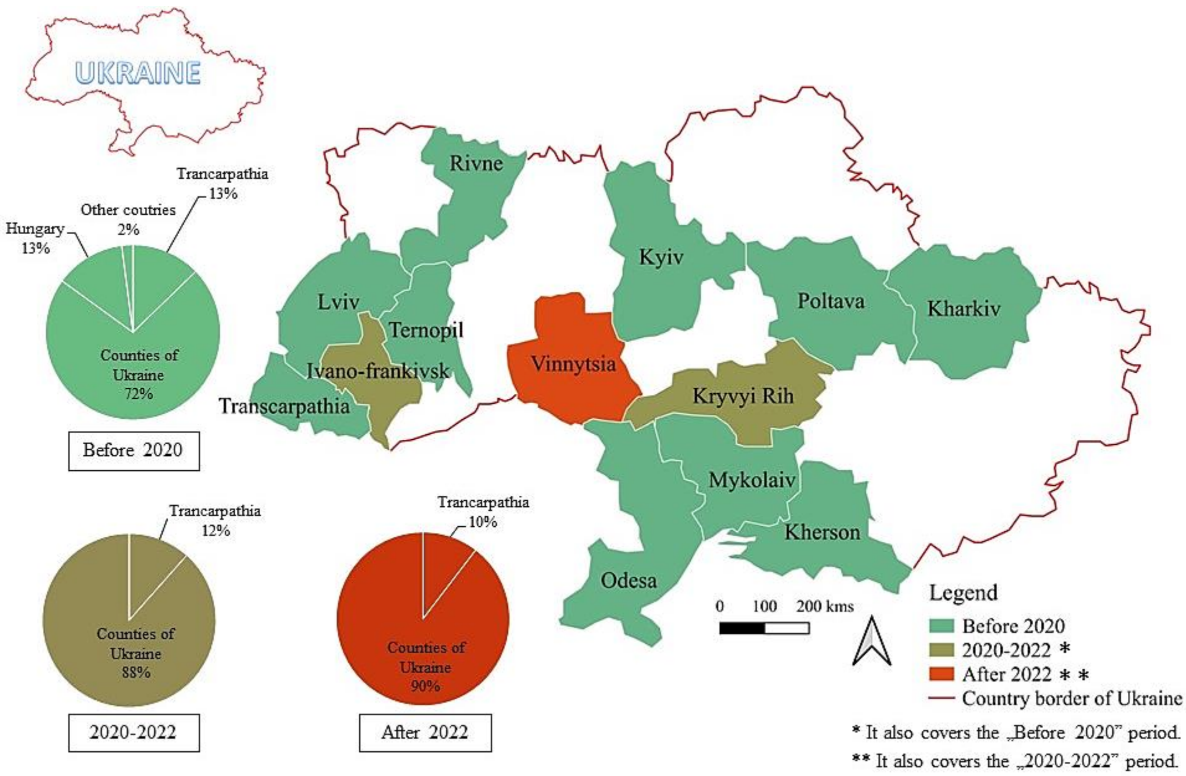

Figure 6. Change in the catchment area of the Beregvidék region, before 2020, between 2020-2022 and after 2022 (Source: Own editing)

We looked for a relationship between whether estate size affects how resilient wineries are to sudden shocks. The results of our correlation analysis show that the COVID-19 pandemic was not related to territorial size (r=-0.251; p=0.586). This was because the restrictive measures had a uniform effect on market segments. According to winemakers, tourist traffic almost completely stopped in the first months of the COVID-19 pandemic, which can be explained by the various restrictions. To prevent wineries from going bankrupt, winemakers sold their products through a parcel delivery service (NovaPosta). After the restrictions were eased, 100% of the clientele was domestic tourists, while the number of guests from Transcarpathia decreased slightly, falling by 1%. Transcarpathia attracted two new sending regions (Ivano-Frankivsk and Kryvyi Rih). We also asked the winemakers about where most of the guests came from after the events of February 2022, and how they survived the first months of the escalation of the Russian-Ukrainian conflict. When compiling the questionnaire, we assumed that the Russian attack in 2022 and the introduction of martial law had and still have a great influence on guest arrivals and their territorial composition. The respondents – with one exception – almost unanimously answered that there was a decline in traffic and a shortage of labor, and there were also winemakers who left the country for a few months. As for their clientele, the winemakers stated that only domestic tourists visit them, who are usually pensioners or women with children. Vinnytsia appeared on the map as a new sending area.

However, when the war broke out, farmers of different sizes had the opportunity to create different strategies that could help them survive, as there were no strict legal regulations for the sector. The correlation analysis shows that there is a strong positive correlation between the variables (r=0.763). This suggests that winemakers farming in larger areas probably managed the challenges of the first months of the war better. We consider the correlation significant (p=0.046).

Winemakers sold their wines in the largest quantities before 2022 at Transcarpathian festivals and fairs, as well as in the framework of wine tastings and through mail-order services (Sass & Bártfai, 2016) (Table 2), but this has changed today.

Table 2. Changes in wine sales before and after 2022 (Source: Own editing)

Before 2022	Sales	After 2022
57%	parcel service at festivals and fairs in Transcarpathia	0%
26%	parcel service	34%
43%	wine tasting	49%
5%	in local (Transcarpathian) restaurants	32%
0%	export	4%

Due to the events of 2022, various festivals and fairs were completely canceled, so the percentage distribution of sales has also changed. Most wines can be sold within the framework of wine tastings, but the number of guests has decreased significantly. Due to the war situation, the role of parcel delivery services has increased, and sales have become more prominent in local (Transcarpathian) restaurants. Export will also appear after 2022, but only one winemaker has the necessary license for this. If we look at the statistical characteristics of wine sales by wineries through different sales channels, they can be summarized as follows:

1. *Wine tasting:* six of the wineries surveyed sell through wine tasting, the sales rate ranges between 20% and 60%, and the average is 46.5%, so wine tasting plays a significant role in sales.
2. *Own cellar:* this channel is only included in the case of two wineries, and the sales rate also shows a large difference (5% and 33%). The average was 19%, but due to the large variance, we do not consider this a reliable indicator.
3. *Vinoteca:* also only two wineries use this sales channel, the rates range between 30% and 50%, and the average is 40%.
4. *Mail order sales:* six wineries use this method, the sales rate varies between 20% and 50%, and the average was 40%. This suggests that parcel delivery could be a popular alternative.
5. *Festivals:* only one respondent indicated festivals as a sales channel, where the sales rate is only 1%.
6. *Export:* one winery exports its wine, and the sales rate is 19%, only this one winery has the appropriate license for this.
7. *Restaurant sales:* two wineries indicated this sales channel, the sales rate is between 10% and 33%, and the average was 21.5%.

The statistical analysis shows that wine-tasting and mail-order sales appear to be the most popular sales methods, with both being used by six wineries. Festivals and export sales are currently less widespread sales channels in the sample examined. Wine shop and restaurant sales occur in fewer wineries, but where they are used, they have a significant share, with wine shop and restaurant sales together accounting for 60% of the total sales on average.

The prominent share of wine tasting is not surprising, as 85.7% of the service providers hold wine tastings, and among them, 83.3% do so at their wineries. Only one respondent has a separate facility for this purpose outside of their cellar. The facilities can accommodate a minimum of 50 and a maximum of 65 people. On average, nine different wines are offered for tasting, with the smallest selection available at Parászka Winery, where there are six types of wine, and in 2024, they charged 1000 HUF (107 UAH) for a tasting. The most diverse selection can be found at Sass Winery (here, the price for a tasting is 60-80 UAH per person, with a choice of 15 different wines, though the exact amount is not listed on their website). We examined whether there is a relationship between producing more grapes and offering more varieties of wine for tasting. The result showed that there is no significant correlation (p=0.709) between producing more grapes and offering a greater variety of wines for tasting to guests. The responses to the question regarding increasing the sustainability/competitiveness of wineries are interesting; we used a cross-tabulation analysis for this. We looked at the necessary developments for sustainability depending on how long the winemakers have been involved in viticulture.

Wineries that have been involved in viticulture for 11-15 years (4 cases) primarily emphasized the development of equipment, products, licenses, foreign cooperation opportunities, web development, as well as infrastructure developments (building cellars and tasting areas, expanding vineyards). They also expressed an interest in marketing development and highlighted the importance of human capital development. This broad range of development needs suggests that relatively new wineries still have extensive development needs, particularly in strengthening infrastructure and market presence.

Winemakers with 16-20 years of experience (1 case) see the only development direction in automation and cooperation with tourism professionals. This may indicate that, for a winery that has been in operation for a longer time, the focus is on automation and the development of tourism-related connections. In the sample, the two longest-operating service providers (20-25 years) emphasized quality preservation, highlighting the uniqueness of the wine region, parking, and other infrastructure developments, and obtaining licenses. It can be said that older wineries focus more on preserving value and developing existing infrastructure rather than expanding their product portfolio.

CONCLUSIONS AND DISCUSSION

The results of the study on the wineries in the Bereg Region allow for drawing relevant conclusions from several perspectives. The majority of the winemakers participating in the research are male, have higher education, and winemaking is their primary source of livelihood. The size of the estates shows significant variation, ranging from 1.2 hectares to 25 hectares, with an average vineyard area of 14.2 hectares. There has been no significant change in average estate sizes over the past century (Kovács, 2009). Although the correlation between estate size and other grape-related activities is not statistically significant, some trends suggest that those managing larger areas may engage in more diverse activities (which could provide greater crisis resilience by being more diversified). The weak to moderate correlation between estate size and different activities (such as growing table grapes, producing spirits, and sparkling wines) and its statistical insignificance (p=0.370) suggest that although there is some connection, larger estates do not necessarily lead to more activities or opportunities. This is in contrast to (Marks' 2011) study, which states that larger estates offer more opportunities, and investors prefer larger, relatively cost-effective estates. However, the literature also shows similar findings to our research, such as studies on the economic strategies of wineries, which suggest that smaller wineries can successfully implement diversification strategies if they can leverage favorable market conditions around them (such as digitalization tools) (Járdány & Duray, 2020). Furthermore, the results may also suggest that the efficiency of farming is more dependent on the business models applied, rather than just the size of the estate.

The diversity of grape varieties grown by winemakers well reflects the geographical and historical characteristics of the region. The 23 grape varieties presented in the study, most of which come from the region, are predominantly white, with 30% of them being of Hungarian origin and 22% of Ukrainian origin. Among the indigenous varieties, Bakator Muscat and Furmint are noteworthy, as these were present in the region during historical Hungary. These grape varieties were already mentioned in the recommendations of Act V of 1896 (Sass & Bártfai, 2016). The largest proportion of wines produced by winemakers is dry and semi-dry, while the production of rosé wines is minimal. The diversity of the grape and table grape varieties produced by the wineries also yielded interesting results. 74% of the responding winemakers grow white grape varieties, which aligns with global wine production trends, as the demand for white wines often exceeds that for red wines, particularly in Central and Eastern Europe (Mueller & Ray, 2024). The prominent role of Ukrainian and Hungarian-origin varieties, such as Olaszrizling and Furmint, reflects the historical and cultural influences of the region. The emphasis on indigenous varieties not only strengthens the identity of the wineries but can also ensure the sustainability of local wineries, as native varieties often adapt better to local climatic conditions (Winkler, 2019). The majority of winemakers hold higher education degrees (85.7%), and for most of them, winemaking is their primary source of income. Our findings are consistent with the literature, which highlights the importance of specialized education for success in winemaking and other agricultural sectors. The profitability and sustainability of wineries often depend on applying learned knowledge, especially in areas such as viticulture, winemaking technology, and market access strategies (Sedikova, 2017).

A significant finding of the research is that the COVID-19 pandemic and the Russian-Ukrainian war drastically reshaped the clientele and sales channels of wineries. In the initial phase of the pandemic, tourism significantly declined, while as a result of the war, the clientele shifted, and wineries were visited exclusively by domestic tourists, mostly retirees and family women. Based on the results of the correlation analysis, a significant positive relationship can be identified between estate size and the ability to react to war-related shocks, suggesting that those with larger estates were better able to adapt to the crisis. The impact of COVID-19 and the Russian-Ukrainian war on the clientele of wineries raises interesting socio-economic questions. Although service providers have adapted to crises to varying degrees, it is undeniable that the potential of tourism can play a significant role in the economic recovery and development of a region (Vasvári et al., 2025). The growing role of mail-order services and the limited export suggest that online and local sales channels have become the key to survival for wineries. The literature interprets this phenomenon as a rapid response to global economic shocks, and for small and medium-sized enterprises, flexibility and diversification provided a survival strategy (Pogácsás and Szepesi, 2023). Regarding the changes in wine sales channels, the most significant transformation was the cessation of festivals and fairs in Transcarpathia, which had previously accounted for the largest share of sales. In parallel, the role of wine tastings and mail-order services increased, and the sales in local restaurants also rose significantly. The emergence of exports is a small but notable trend. The increasing role of wine tastings and mail-order services and the absence of festivals highlight the strategic adaptation of Transcarpathian wineries to the changing economic environment.

The spread of mail orders and wine tastings emphasizes the role of modern technologies and direct market connections, while the absence of festivals and fairs suggests that wineries must develop their sales strategies toward online and local community engagement (Curtis et al., 2021). Overall, the research pointed out that the wineries of Bereg Region have been shaped by several external factors in recent years – the pandemic and the war – likely in an overall not-positive direction (although these events may, in the long run, have strengthened their resilience). The adaptation strategies of the farmers varied, but those managing larger areas exhibited greater resilience. The transformation of sales strategies and the change in clientele composition may have long-term effects on the wine industry's development and sustainability in the region.

Finally, we should also mention that our research has limitations. Only 7 wineries responded to the questionnaires during the data collection, a relatively small sample and it does not ensure that it reflects the views of the entire wine community. Furthermore, the research is limited to the Bereg region, so the experience and results obtained here may not apply to other wine regions in Ukraine or other countries. Furthermore, during data collection, the impact of the war and COVID-19 strongly influenced the operations of wineries (e.g. their market environment and its changes).

The data obtained may not be representative of the post-war period and therefore the results may not apply to future situations. Alternatively, subjectivity and respondent bias appear to be limiting factors, as the owners of the wineries provided the information in the survey and their opinions and interests may influence the data, especially the economic situation and the answers on sustainability.

REFERENCES

Admin (2007). *Északi pezsgés (Northern Effervescence)*. 24.hu. (accessed 02.03.2025). https://24.hu/fn/gazdasag/2007/06/28/szaki_pezsges/

Alebaki, M., & Iakovidou, O. (2011). Market Segmentation in Wine Tourism: A Comparison of Approaches. *Tourismos: An International Multidisciplinary Journal of Tourism*, 6(1), 123-140. https://doi.org/10.1080/09571264.2015.1051218

Basyuk, D. I., & Muzychka, Y. O. (2018). *Wine Tourism in Ukraine*. (accessed 18.02.2025). https://dspace.nuft.edu.ua/server/api/core/bitstreams/7d07c490-8bec-449a-ba77-e855943daf55/content

Bene, Zs. (2019). *Az egészségtudatos fogyasztói magatartás megjelenése a borfogyasztási trendekben Magyarországon [The Emergence of Health-conscious Consumer Behavior in Wine Consumption Trends in Hungary]*. In: Gyurkó, Á., Somodi-Tóth, O. (szerk.): #TURIZMUS #SZÁLLODA #VENDÉGLÁTÁS. Líceum Kiadó, Eger, ISBN 978-963-496-132-1, 7-17, (accessed 17.02.2025). https://publikacio.uni-eszterhazy.hu/4735/1/Turizmus_tanszek_konf_kotet.pdf

Cerdá, J. M., Nodari, E., Rojas, F., Petrick, G., & Mejía Ayala, W. (2024). Editorial Vitivinicultura en las Américas. *Perspectiva Geográfica, 29*(3), 1–5. (accessed 17. 02. 2025). https://revistas.uptc.edu.co/index.php/perspectiva/article/view/17762

Cherevko, H. (2024). Poverty in Ukraine due to Russian Military Aggression. *Nierówności Społeczne a Wzrost Gospodarczy,* nr 79 (3/2024) *Social Inequalities and Economic Growth,* no. 79 (3/2024). https://doi.org/10.15584/nsawg.2024.3.2

Curtis, K. R., & Solucum, S. (2021). Rural Winery Resiliency and Sustainability through the COVID-19 Pandemic. *Sustainability*, 13(18). https://doi.org/10.3390/su131810483

Dancsokné, Fóris, E., Filepné, Kovács, K., Hubayné, Horváth, N., Kutnyánszky, V., Módosné, Bugyi I., Sallay, Á., Szilvácsku, Zs., Varga, D., & Kollányi, L. (2023). *Táj- és turizmusfejlesztési lehetőségek Upponyban és környékén [Landscape and Tourism Development Opportunities in Uppony and Its Surroundings]*. Földrajzi Közlemények, 147(2), 185–201. https://doi.org/10.32643/f k.147.2.9

Darabos, F., Kőmíves, Cs., & Z. Szabó, R. (2024). Post-pandemic Pursuits: Activity Preferences of Rural Tourists in Western Transdanubia. *Hungarian Geographical Bulletin*, 73 (2024) (3), 283–301. https://doi.org/10.15201/hungeobull.73.3.5

del Rey, R., & Loose, S. (2023). State of the International Wine Market in 2022: New Market Trends for Wines Require New Strategies. *Wine Economics and Policy*, *12*(1), 3–18. https://doi.org/10.36253/wep-14758

Dressler, M. (2023). Generic strategic profiling of entrepreneurial SMEs – environmentalism as hygiene factor. *Int Entrep Manag J* 19, 121–150. https://doi.org/10.1007/s11365-022-00809-2

Dudić, B., Mittelman, A., Gubíniová, K., Bartáková Pajtinková, G., Kader, S., Zejak, D., & Spalević, V. (2024). Wine Industry and Wine Markets: Dynamics, Challenges, and Implications of Globalization. *AGROFOR International Journal*, 9(1). (accessed 17. 02. 2025). https://agrofor.ues.rs.ba/data/20240305-03_Dudic_et_al.pdf

Faria, S., Gouveia, S., Guedes, A., & Rebelo, J. (2021). Transient and Persistent Efficiency and Spatial Spillovers: Evidence from the Portuguese Wine Industry. *Economies*, 9(3), 116. https://doi.org/10.3390/economies9030116

Getz, D., & Brown, G. (2006). Critical Success Factors for Wine Tourism Regions: A Demand Analysis. *Tourism Management*, 27(1), 146–158.

Hall, C., Longo, A., Mitchell, R., & Johnson, G. (2000). Wine Tourism in New Zealand. In: S. L. Hall C.M: Wine Tourism around the World: Development, Management and Markets, *Oxford: Elsevier Science*, 150-176.

Hall, C. M., & Sharples, L. (2008). Food and Wine Tourism: Integrating Food, Travel and Territory. *CABI Publishing*.

Happ, E., Ivancsó, Zs., & Kupi, M. (2020). *Digitális eszközök és módszerek használatának marketingszempontú feltáró elemzése a magyar turisták körében [An Investigative Study of the Use of Digital Marketing Tools and Methods Among Hungarian Tourists].* Turizmus Bulletin 20(2):4-13.

Harsányi, D., Szántó, S., & Totth, G. (2014). *A hazai borászatok marketingorientációja [The Marketing Orientation of Domestic Wineries]*. (accessed 17. 02. 2025). http://publikaciotar.uni-bge.hu/304/1/Hars%C3%A1nyi-Sz%C3%A1nt%C3%B3-Totth.pdf

Harsányi, D., Zarándné, Vámosi, K., & Hlédik, E. (2022). *Az egyes generációk borfogyasztási szokásainak vizsgálata Magyarországon (Examining the Wine Consumption Habits of Each Generation in Hungary).* Vezetéstudomány / Budapest Management Review, liv. évf. 2023. 7–8., 44-57.

Hofmeister, T. Á., Kasza, K. K., & Piskóti, M. (2013). *A környezetbarát fogyasztói magatartás formái, motivációi és a hátterükben álló pszichográfiai tényezők vizsgálata Magyarországon (Examining the Forms, Motivations and Underlying Psychographic Factors of Environmentally Friendly Consumer Behavior in Hungary).* Marketing és Menedzsment 47:(3), 34–42.

Horváth, L. (2000). *Barangolás a benei szőlőhegy múltjában (Wandering Through the Past of the Bene Vineyard).* Hatodik Síp Alapítvány Mandátum Kiadó, Budapest–Beregszász.

Interreg-CEETO (2018). *Kézikönyv a fenntartható turizmus jó gyakorlatáról a védett területeken (Handbook on Good Practices for Sustainable Tourism in Protected Areas).* (accessed 02. 03. 2025). https://programme2014-20.interreg-central.eu/Content.Node/Handook-Sustainable-Tourism-HU-CEETO-Interreg.pdf?utm_source=chatgpt.com

Jáki, E., Kádár, B., & Michalkó, G. (2024). *Az immunitás nyomában: a hazai turisztikai vállalatok szakágazati és területi sajátosságai a polikrízis időszakában (In Pursuit of Immunity: The Sectoral and Territorial Characteristics of Hungarian Tourism Companies during the Polycrisis Period)*. Területi Statisztika, 2024, 64(6): 801–826. https://doi.org/10.15196/TS640605

Járdány, K., & Duray, B. (2020). *Új módszer a magyarországi szőlő-bor termékpályák digitális leképezési lehetőségére (A New Method for the Digital Mapping Possibility of Hungarian Grape Wine Product Lines).* Studia Mundi – Economica 7(2), 18-30. https://doi.org/10.18531/Studia.Mundi.2020.07.02.18-30

Jones, G. V., White, M. A., Cooper, O. R., & Storchmann, K. (2005). Climate Change and Global Wine Quality. *Climatic Change*, 73(3), 319–343.

Kastenholz, E., Paço, A., & Nave, A. (2022). Wine Tourism in Rural Areas–Hopes and Fears Amongst Local Residents. *Worldwide Hospitality and Tourism Themes,* 15. 1. ISSN: 1755-4217. https://doi.org/10.1108/WHATT-08-2022-0095

Karmacsi, Z., & Sass, E. (2023). The linguistic landscape of festival tourism in Transcarpathia. *Acta Academiae Beregsasiensis Philologica,* 2(1), 139-160. https://doi.org/10.58423/2786-6726/2023-1-139-160

Kaur, P., Ghoshal, G., & Banerjee, U. C. (2019). Traditional Bio-preservation in Beverages: Fermented Beverages. In: *Preservatives and Preservation Approaches in Beverages,* 69-113: Elsevier.

Kinczel, A., & Müller, A. (2023). The Emergence of Leisure Travel as Primary Preventive Tools in Employee Health Behavior. *GeoJournal of Tourism and Geosites*, Year XVI, 47(2), 432-439. https://doi.org/10.30892/gtg.47209-1041

Kiss, K., & Kovács, E. (2018). *Turisztikai trendek (Tourism Trends)*. – Sorozat: Turizmus és mobilitás. Akadémiai Kiadó, Budapest. ISBN: 978 963 454 231 5. https://doi.org/10.1556/9789634542315

Kovács, D., & Horeczki, R. (2024). *Hagyomány és nyitottság – Négy megoldásra váró terület a hazai gasztronómiában [Tradition and Openness – Four Issues to be Settled in Hungarian Gastronomy]*. Turizmus Bulletin, XXIV. évf. 4. sz., 47-55. https://doi.org/10.14267/TURBULL.2024v24n4.5

Kovács, E. (2009). *Szőlészet, borászat Bereg-vidéken (Viticulture and Winemaking in the Bereg Region).* Intermix Kiadó, Ungvár-Budapest. 108 p.

Kucherenko, V., & Uspalenko, O. (2023). *Relevance of the Production of Non-alcoholic Wines*. BIO Web of Conferences 68, 03017. https://doi.org/10.1051/bioconf/20236803017

Kudla, N., & Hamkalo, N. (2019). *Emergence of Wine Tourism and its Development in Ukrainian Transcarpathia*. In: Milkovic, M., Kecek, D., Hammes, K. (eds.): Economic and Social Development 46th International Scientific Conference on Economic and Social Development – „Sustainable Tourist Destinations". Book of Proceedings. Varazdin Development and Entrepreneurship Agency, Varazdin, Croatia; University North, Koprivnica, Croatia; Faculty of Management University of Warsaw, Warsaw, Poland; Faculty of Law, Economics and Social Sciences Sale – Mohammed V University in Rabat, Morocco. ISSN 1849-7535, 238-247.

Lease, T. M., Boswin, L. K., & Conover, T. H. (2023). Characteristics of an Engaging Virtual Wine Tasting. *Wine Business Journal.* https://doi.org/10.26813/001c.72984

Lehoczky, T. (1881). *Bereg vármegye monographiája [Bereg County Monograph]*. Pollacsek Miksa Könyvnyomdája, Ungvár, III. kötet, 1. rész. 429 p.

Ljavic, D., Radovic, M., Kulina, M., Zejak, D., Spalevic, V., Kader, S., Dudic, B., Michael, R., Campbell, J., Jaufer, L., & Glisic, I. (2023). Influence of Cultivar and Fertilization Treatment on the Yield and Leaf Nutrients Content of Apple (Malus Domestica Borkh.). *Heliyon*, e16321. https://doi.org/10.1016/j.heliyon.2023.e16321

Marks, D. (2011). Competitiveness and the Market for Central and Eastern European Wines: A Cultural Good in the Global Wine Market. *Journal of Wine Research*, 22(3), 245-263. https://doi.org/10.1080/09571264.2011.622517

Michalkó, G., Németh, J., & Birkner, Z. (2023). *A biztonság szerepe a turisztikai termékfejlesztésben és –menedzsmentben (The Role of Safety in Tourism Product Development and Management).* Bay Zoltán Alkalmazott Kutatási Közhasznú Nonprofit Kft. p. 198.

Michalkó, G. (2012). *Turizmológia: elméleti alapok (Tourismology: Theoretical Foundations).* Akadémiai Kiadó, Budapest.

Molnár, Cs., & Remenyik, B. (2015). *Egészségturizmus egy kicsit másképpen, avagy a vinoterápia néhány aspektusa (Health Tourism a Little Differently, or Some Aspects of Vinotherapy).* In: Rátz, T., Michalkó, G. (szerk.): Kreativitás és innováció a turizmusban. Turizmus Akadémia 7. Kodolányi János Főiskola, MTA CSFK Földrajztudományi Intézet, Magyar Földrajzi Társaság. Székesfehérvár–Budapest, ISBN: 978-615-5075-32-2, 122-133.

Morrison, A., & Rabellotti, R. (2017). Gradual Catch Up and Enduring Leadership in the Global Wine Industry. *Research Policy*, 46(2), 417-430. https://doi.org/10.1016/j.respol.2016.09.007

Mueller Loose, S., & Del Ray, R. (2024). State of the International Wine Markets in 2023. The Wine Market at a Crossroads: Temporary or Structural Challenges? *Wine Economics and Policy*, 13(2), 3-14. https://doi.org/10.36253/wep-16395

Mura, L., & Stehlíková, B. (2025). Artificial Intelligence and Tourism in the EU: A Data-Driven Analysis of Adoption and Economic Contribution. *Folia Geographica*, Paper No. 25-67/1-738. 32 p. (accessed 13. 03. 2025). https://www.unipo.sk/public/media/48889/ARTIFICIAL_INTELLIGENCE_AND_TOURISM_IN_THE_EU_FG_67-1-25-738_Online_First.pdf

Navia-Osorio, E. G., Porras-Amores, C., Mazarrón, F. R., & Cañas, I. (2023). Impact of Climate Change on Sustainable Production of Sherry Wine in Nearly-zero Energy Buildings. *Journal of Cleaner Production*, 382, 135260. https://doi.org/10.1016/j.jclepro.2022.135260

Pogácsás, P., & Szepesi, B. (2023). *A koronavírus hatása a magyar kis- és középvállalkozásokra. [The Impact of COVID-19 on SMEs in Hungary].* Vezetéstudomány / Budapest Management Review Liv. Évf. 2023. 2. Szám. 25-39. https://doi.org/10.14267/Veztud.2023.02.03

Qesja, B., & Bastian, S. E. P. (2023). *Riverland on the Verge: Promoting International Wine Tourism Through Virtual Reality in Riverland, South Australia.* In: Sigala, M., Haller, C. (eds) Technology Advances and Innovation in Wine Tourism. Springer, Singapore. https://doi.org/10.1007/978-981-19-8277-4_8

Riabinina, N. (2024). Economic Welfare and Social Well-being of the Population of Ukraine in the Postwar Years. ISSN 2524-2547. *Соціальна Економіка, 2024, випуск 67*. https://doi.org/10.26565/2524-2547-2024-67-06

Santini, C., Cavicchi, A., & Bertella, G. (2024). *Cornering Authenticity in Wine Tourism: The Case of Tuscany.* In: Martínez-Falcó, J., Marco-Lajara, B., Sánchez-García, E., Millán-Tudela, L.A. (eds) Strategic Management in the Wine Tourism Industry. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-031-54837-6_2

Sarkadi, E., Szabó, G., & Urbán, A. (2000). *Borturizmus szervezők kézikönyve (Wine Tourism Organizers' Manual)*. Baranya Megyei Falusi Turizmus Szövetség, Pécs.

Sass, E., & Bártfai, E. Gy. (2016). *Bortermelés Kárpátalján és az ezzel összefüggő turisztikai lehetőségek (Wine Production in Transcarpathia and Related Tourism Opportunities).* In: Berghauer, S., Dnyisztrjanszkij, M., Fodor, Gy., Gönczy, S., Izsák, T., Jakab, N., Molnár, J., Molnár, D. I., Sass, E., Papp, G., Vince, T. (szerk.): Társadalomföldrajzi kihívások és adekvát válaszlehetőségek a XXI. század Kelet-Közép-Európájában. Nemzetközi Földrajzi Konferencia, Beregszász, 2016. március 31 – április 1., II. Rákóczi Ferenc Kárpátaljai Magyar Főiskola, Kálvin Nyomda, Beregszász, 535-542.

Sedikova, I. (2017). Management of Professional-qualification Development of Employees in Winery Industries. *Food Industry Economics*, 9(4), 62-67.

Sutiadiningsih, A., Purwidiani, N., Dewi, I. H. P., Hamdani, A. T., & Tho Le, H. (2023). Gastronomic Experience as a Motivation for Tourists to Choose Tourist Destinations in Indonesia and Vietnam. *GeoJournal of Tourism and Geosites,* Year XVI, 47(2), 424-431. https://doi.org/10.30892/gtg.47208-1040

Szmirkó, G. (2019). *X, Y, Z – avagy (bor)fogyasztói generációváltás (X, Y, Z – or the Generational Change of (Wine) Consumers)*. 29(4). (accessed 22. 02. 2025). https://magyarmezogazdasag.hu/2019/09/02/x-y-z-avagy-borfogyasztoi-generaciovaltas/

Tarpai, J. (2013). *Természeti és társadalmi erőforrások szerepe Kárpátalja turizmusfejlesztésében és hatása a területfejlesztésre (The Role of Natural and Social Resources in the Tourism Development of Transcarpathia and Their Impact on Regional Development)*. PhD-értekezés, Pécs, 181 p.

Tessényi, J., & Katona, N. (2023). *A hazai bormarketing stratégiai dimenziói (Strategic Dimensions of Domestic Wine Marketing).* Gazdálkodás, 67(3), 212–225. https://doi.org/10.53079/GAZDALKODAS.67.3.t.pp_212-225

Totth, G. (2021). *A csökkentett alkoholtartalmú és alkoholmentesített borok fogyasztói megítélése és perspektívái [(Magyarországon) (Consumer Perceptions and Perspectives of Reduced-alcohol and Alcohol-free Wines (in Hungary)]*. https://doi.org/10.20494/TM/8/2/1

Vasvári, M., Gergely, L., & Dávid, L. D. (2025). Tourism as a catalyst for resilience: Insights from a literature review on crisis adaptation and regional development. *Ecocycles*, 11(1), 31-45. https://doi.org/10.19040/ecocycles.v11i1.479

Winkler, A. (2019). *Őshonos és Hungarikum fajták (Native and Hungaricum Varieties)*. (accessed 20.02.2025). https://dubicz.hu/oshonos-es-hungarikum-fajtak/

Article history: Received: 14.03.2025 Revised: 30.05.2025 Accepted: 24.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1348-1361
DOI 10.30892/gtg.602spl30-1506

ANALYSIS OF THE CURRENT STATE AND DYNAMICS OF TOURISM INDUSTRY DEVELOPMENT IN AKMOLA REGION, KAZAKHSTAN

Yerkegul DYUSSEKEYEVA [1], Dinara KADYRBEKOVA [1*], Yerlan ISSAKOV [2], Aigul AGELEUOVA [1], Dinara ZHAKSYBEKOVA [1], Tamara GAJIĆ [3*]

[1] Kazakh Academy of Sports and Tourism, Tourism Faculty, Tourism and Services Department, Almaty, Kazakhstan; erkegul-94@mail.ru (Y.D.); 6537275@mail.ru (D.K.); aigulinskaya@mail.ru (A.A.); d.kabirovna@mail.ru (D.Z.)
[2] Abai Kazakh National Pedagogical University, Faculty of Natural Sciences and Geography, Department of Geography and Ecology, Almaty, Kazakhstan; Széchenyi István University, Kautz Gyula Faculty of Business and Economics Department of Tourism and Hospitality, Győr, Hungary; erlan.issakov@gmail.com (Y.I.)
[3] Geographical Institute "Jovan Cvijić", Serbian Academy of Sciences and Arts, Belgrade, Serbia; Swiss School of Business and Management, Geneva, Switzerland; tamara.gajic.1977@gmail.com (T.G.)

Citation: Dyussekeyeva, Y., Kadyrbekova, D., Issakov, Y., Ageleuova, A., Zhaksybekova, D., & Gajić, T. (2025). Analysis of the current state and dynamics of tourism industry development in Akmola region, Kazakhstan. *Geojournal of Tourism and Geosites*, 60(2spl), 1348–1361. https://doi.org/10.30892/gtg.602spl30-1506

Abstract: Despite Kazakhstan's unique natural and climatic features, rich recreational potential, and developed sanatorium infrastructure, the country has not yet become a competitive international tourist destination. In particular, the Akmola region, which has notable natural assets, remains underdeveloped in terms of tourism, and its potential is not effectively utilized to attract foreign tourists. This study aims to analyze the current state of tourism in the Akmola region, identify key problems, and propose possible solutions to enhance its development. To assess public perception, a 14-item questionnaire was created based on relevant literature and distributed via social networks. Survey questions were offered in the form of docs.google.com to facilitate distribution. A total of 503 respondents participated in the survey. Results show that Burabai National Park was recognized by 43.1% of respondents as having high tourism potential, followed by Kokshetau National Park (28.2%) and Buiratau (16.5%). At the same time, as for the attractiveness of tourist and recreational facilities in Akmola region, 57.1% of respondents answered that they are unique in nature, and 26.2% believe that ecotourism has great opportunities. Because the unique nature of Akmola region is a diverse landscape that includes: mountains, lakes, rivers, forests and steppes. However, 71% of respondents expressed dissatisfaction with the level of hotel development in the region, and over 50% emphasized the need to improve tourism infrastructure. The findings highlight the necessity of integrated development of the region's tourist and recreational resources. In particular, it is necessary to repair the main roads, ensure the renewal of public transport and tourist routes. This allows us to provide accommodation in accordance with international standards, provide quality services at an affordable price and attract significant investment. Strengthening these aspects will not only improve the attractiveness of the region to global tourists but also contribute to the socio-economic well-being of the local population and foster the sustainable development of the Akmola region. Ultimately, the proposed strategies for the development of the tourism industry in Akmola region should be aimed at the effective use of local resources and increasing the competitiveness of the region, improving the socio-cultural level of the region by increasing the flow of tourists.

Keywords: tourism industry, analysis of the current state of tourism, circular tourism development, Akmola region, Kazakhstan

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INTRODUCTION

Tourism has become a lucrative industry, generating a large amount of money for the state's economy by providing recreational activities for millions of people. According to the World Tourism Organisation, tourism revenues have grown at 7.9% per year over the past ten years (UNWTO, 2022; Alatawi et al., 2023). Tourism accounts for 1/9th of the world's domestic national product, more than 11% of international investment, one in nine jobs in world manufacturing (Mehrad et al., 2023). In this regard, Kazakhstan has great opportunities to create a competitive tourism industry among Eurasian countries (Kenzhebekov et al., 2021), and after the pandemic period most of the generations are involved (Mishchuk et al., 2023; Sharma et al., 2023; Gallardo Vázquez et al., 2023; Vardar et al., 2025).

In particular, convenient geographical location, political stability, aspiration for democracy, economic reforms, diversity of natural landscapes, flora and fauna, cultural and historical recreational resources determine high tourist potential of the region. According to the results of the current 2024 year, the inflow of foreign tourists to Kazakhstan increased to 11.5 million people, compared to 2023 doubled, the income of accommodation facilities increased by 27%. (Shaikin et al., 2021; National Bureau of Statistics, 2023; 2024). From this we can see that world tourists go to Kazakhstan, the main flow of tourists is directed to tourist destinations of Almaty, Astana and Turkestan, as well as Akmola region, as these cities are economic and financial centres of Kazakhstan (Issakov et al., 2023a; Dziekański et al., 2024).

* Corresponding author

Despite favorable statistical trends and the richness of natural and cultural heritage, tourism development in Kazakhstan, particularly in the Akmola region, faces a number of challenges that hinder its full affirmation as a competitive destination. Previous research predominantly relies on theoretical frameworks or partial analyses, while comprehensive and critical evaluations of the actual state of tourism in the region particularly regarding local community perceptions, service and infrastructure availability, and institutional shortcomings are largely lacking. Moreover, the relationship between economic benefits and the constraints of spatial planning remains insufficiently explored, which complicates the formulation of effective development strategies.

The aim of this study is to examine the current state and development dynamics of the tourism industry in the Akmola region through a multidimensional approach that integrates statistical indicators with the views of the local population. The research focuses on identifying key issues, analyzing existing capacities, and formulating concrete proposals to enhance sustainable tourism. The significance of this research lies in its ability to address underexplored aspects of tourism development in the context of post-socialist and peripheral regions of Central Asia. By offering empirically grounded insights into infrastructure conditions, community perceptions, and governance challenges, the study moves beyond the normative scope that characterizes much of the existing literature. Its value rests in the integration of quantitative and qualitative findings to shape sustainable development models based on actual needs rather than assumed potentials. Through this analytical foundation, the research provides relevant guidelines for strengthening institutional capacities, improving resource management, and enhancing the region's competitiveness at both national and international levels. In doing so, it lays the groundwork for long-term, inclusive, and strategically oriented tourism development in the Akmola region, with broader implications for similarly positioned territorial contexts across Central Asia.

LITERATURE REVIEW

The contemporary discourse on sustainable tourism highlights the growing need to balance the development of tourism infrastructure with the preservation of natural and cultural resources, especially in regions with rich yet underutilized potentials, such as those found in parts of Central Asia (Akiyanova et al., 2019; Rakhmetova et al., 2024). Managing tourism destinations in a sustainable manner involves not only infrastructure development and local engagement, but also the capacity to navigate institutional, economic, and environmental complexities, which are often heightened in post-socialist and structurally less integrated environments (Zhoya et al., 2024). Dodds (2025) underscores the importance of a multi-stakeholder approach in achieving long-term sustainability in tourism. Drawing on a 15-year case study of Tofino, her work demonstrates that enduring collaboration among local communities, governments, and private entities can mitigate the risks of overtourism and resource overexploitation. While valuable, the framework is rooted in contexts with relatively high levels of governance capacity and infrastructure, making direct applicability to Central Asian settings more challenging. In the context of innovation and leadership, Zada et al. (2025) examine how social media–driven service innovation, when paired with sustainable leadership, can accelerate the implementation of environmentally and socially responsible practices in tourism and hospitality. This model provides insight into adaptive organizational strategies, but it assumes the existence of advanced digital ecosystems and institutional frameworks, which are still evolving in many emerging tourism destinations. Mahmoud et al. (2025) open a provocative line of inquiry into how public perceptions of the metaverse influence the conceptualization of tourism. While their big-data approach advances the methodological landscape, the emphasis on virtual experience diverges from the pressing concerns of destination regions still facing barriers in accessibility, basic services, and physical infrastructure. Similarly, Bekele & Raj (2025) provide a broad bibliometric synthesis of digital transformation trends in tourism, identifying technology as a key driver of competitive positioning. However, the review offers limited engagement with ground-level conditions such as the logistical, spatial, and socioeconomic realities of underdeveloped destinations which critically influence the feasibility of implementing such digital solutions.

The study by Im et al. (2025) offers a socially oriented perspective, analyzing the experiences of women in executive positions within tourism. It reveals the persistence of structural inequalities and highlights the importance of inclusive leadership in ensuring organizational sustainability. Nevertheless, the study's urban and corporate focus leaves open questions regarding gender equity in decentralized, rural, and infrastructure-limited tourism sectors. Sports tourism has emerged as a potential vector for sustainable destination development, particularly in areas with natural seasonality and ecological appeal. Sudarmanto et al. (2025) address this potential through a systematic review, arguing that well-designed sports initiatives can promote local identity and economic diversification. Yet, the absence of localized case analysis weakens its relevance for areas where tourism remains fragmented, sporadic, and insufficiently promoted. On a more critical front, Zvaigzne et al. (2025) explore the unintended consequences of artificial intelligence integration in tourism, including the erosion of service authenticity and potential job displacement. While these findings raise important ethical and strategic considerations, they are peripheral to the immediate developmental concerns in regions where digital infrastructure is sparse and human capital is oriented toward more basic operational functions. Dogru et al. (2025) further elaborate on the theoretical underpinnings of generative artificial intelligence in tourism research and application. Although comprehensive in scope, the proposed framework assumes advanced technological readiness and institutional receptivity, which may limit its practical utility in less digitally mature environments. Katsaros (2025) offers a human-centered examination of employee burnout in tourism, focusing on how change-related uncertainty and communication dynamics affect staff well-being during periods of organizational transformation. This line of inquiry is useful in understanding workforce resilience, yet does not directly address broader developmental concerns such as spatial inequality or the marginalization of peripheral destinations in national tourism agendas. Finally, Zhang et al. (2025) introduce the application of multi-sensor network technology as a strategy to enhance the value of sports tourism. Although technically innovative, the operational viability of such models depends on substantial investment in both digital and transport infrastructure, resources often lacking in remote and emerging regions, where tourism development is constrained by more fundamental deficits.

The challenges related to achieving sustainability in tourism, present across various geographical and institutional contexts, are particularly pronounced in countries with significant natural potential but substantial developmental limitations. Within this framework, increasing attention in contemporary literature is being directed toward Kazakhstan and the broader Central Asian region, where tourism is increasingly promoted as a tool for territorial development despite persistent mismatches between ambitions and actual capacities (Seken et al., 2019; Mutalieva et al., 2020; Assylkhanova et al., 2023; Tokbergenova et al., 2023; Doszhan et al., 2023). Although Koshim et al. (2023) and Moldagaliyeva et al. (2024) recognize the need to preserve ecosystems in national parks and to organize tourism activities in line with sustainability principles, their work remains more normative than operational. These studies primarily rely on descriptive insights, lacking in-depth analysis of institutional barriers, economic pressures, or local conflicts related to resource use. The same applies to research focused on the well-known attractions of the Akmola region (Mussina et al., 2020; Kabil et al., 2023), where potential is often assumed to be sufficient for development, while factors such as inadequate infrastructure, limited human resources, and seasonal fluctuations are largely overlooked. The development problems of tourism in the Akmola region, identified by Tleubaeva (2019) and Kurmangozhina (2020), although specific, generally remain limited to listing individual factors, without attempting to conceptually integrate them into a comprehensive analytical framework. The absence of systematic and longitudinal analyses, along with insufficient operationalization of data from secondary sources (statistical reports), further complicates the formulation of evidence-based and sustainable development strategies (Barlykov et al., 2019).

Domestic studies (Tiberghien et al., 2018; Belgibayeva et al., 2020; Sadykova et al., 2025) have to some extent succeeded in highlighting the institutional weaknesses that hinder effective tourism governance, yet they rarely address the relationship between local and national policies or the implications of political decentralization for tourism development. Research specifically focused on the Akmola region (Yegemberdiyeva et al., 2020; Iskakova et al., 2021) provides valuable insights into the area's natural and cultural assets, but remains largely descriptive, lacking in-depth analysis of the socio-economic impacts of tourism or the resilience of the destination. Although Sherimova (2024) offers a contemporary perspective on innovation management and digitalization, her work insufficiently considers institutional capacities and the barriers to implementing digital systems, as well as the issue of limited digital infrastructure in peripheral areas. Moreover, her conclusions tend to be more speculative than grounded in concrete practical evaluations.

A similar pattern is evident in international research. Arifin et al. (2025) emphasize the importance of communication among stakeholders in achieving sustainability but overlook the influence of cultural barriers and the uneven distribution of power among institutions and local communities. Karshalova et al. (2025) advocate for the integration of human capital and green technologies; however, their analysis is based on idealized scenarios without consideration of the economic costs of transitioning to such models. While Artemyev et al. (2025) adopt a more methodologically rigorous approach, their study concentrates on the physical burden on tourist sites, failing to integrate social dimensions or user experience analysis. In the context of digital transformation, Tashpulatova & Suyunova (2025) neglect regional disparities in access to and adoption of digital solutions among tourism stakeholders. Despite its analytical strength, the study by Ibragimov et al. (2025) on outbound tourism from Central Asia does not explore the underlying causes that hinder the development of domestic and inbound tourism, nor does it examine inefficiencies in the supply and marketing of domestic destinations. Conversely, Pyagay et al. (2025) identify contradictions in the implementation of eco-innovations, yet their findings remain insufficiently connected to the tourism sector specifically. Kanatuly et al. (2025) provide a useful historical retrospective, but do not offer clear directions for future institutional positioning of tourism. Ecological research, such as that conducted by Gafforov et al. (2024), while valuable in terms of biodiversity conservation, remains disconnected from tourism integration strategies. Similarly, Gulnur & Kamshat (2025) present theoretical sustainability models in specific geographic zones but fail to offer operational recommendations for policymakers or local actors. Finally, although Nadeem et al. (2025) introduce technically advanced methods for analyzing tourist attitudes, their applicability in contexts characterized by limited digital literacy and weak internet infrastructure remains questionable thus constraining the practical value of such tools in peripheral regions of Central Asia.

Previous studies on tourism development in Kazakhstan and the broader Central Asian region have provided important theoretical and empirical insights into the potential of natural and cultural resources, the possibilities of applying digital tools, and the necessity of adopting a sustainable planning approach. However, several limitations have been identified that reduce the applicability of these findings in complex regional contexts. Most of the existing literature relies on normative approaches, while the operationalization of sustainable tourism remains underdeveloped or fragmented. In addition, many studies are predominantly descriptive, lacking a comprehensive analysis of the interrelationships between infrastructure, governance, local participation, and market dynamics. In the case of the Akmola region characterized by its abundance of natural attractions and historical significance there is a lack of research that simultaneously assesses the actual state of tourism capacities, local community perceptions, and institutional challenges in destination management. Based on these identified gaps, it becomes evident that an integrative analytical approach is required one that combines the assessment of tourism infrastructure, community perspectives, and the real level of utilization of natural and cultural resources. For these reasons, this study has been designed as a response to the previously identified methodological and thematic inconsistencies, with the aim of providing a detailed analysis of the current development dynamics of the tourism industry in the Akmola region.

MATERIALS AND METHODS

Akmola region is located in the north-central part of the Republic of Kazakhstan, bordering Kostanay region in the West, North Kazakhstan region, Pavlodar region in the east and Karaganda region in the south (Aitzhanova & Zhaparova, 2023). The relief of the region's territory is diverse: most of the land is occupied by plains, shallow waters, vulnerable dissected river valleys, forested mountains. Akmola region is very rich in natural recreational resources, here mountains, clean air, beautiful lakes and forests adorn the region's edge (Beisenova et al., 2024). The climate of this place is ideal for the creation of an outdoor recreation area and the development of a resort industry (Smagulov, 2021). In addition, in Akmola region along with natural monuments there are a large number of historical and cultural resources, namely historical towns, houses, castles, monuments, military fortifications and modern high-rise buildings attract tourists. Famous Burabai here has long been famous for its unique and inimitable nature, healing climate, as well as rich ancient history (Shulembayeva et al., 2023). Besides Burabai, there are many picturesque regions in Akmola region, for example, in Zerendi district there are many recreation places, including winter ones. Many small houses have been built on the territory of Korgalzhyn Fund for holidaymakers. In Sandyktau, several projects are being implemented to involve private people in tourism activities. Akmola region has a large number of natural resources and natural attractions such as lakes, rivers, mountains and forests, which contribute to the development of active recreation and ecotourism, which requires tourism and recreation development (Štetić et al., 2019; Pantić et al., 2022; Kadyrbekova et al., 2024). In this regard, the development of the cluster system of the resort area of Akmola region, the capital recreation area, sacred reserves and natural areas (Figure 1) will increase the tourism potential of Akmola region and improve the current state of the tourism industry.

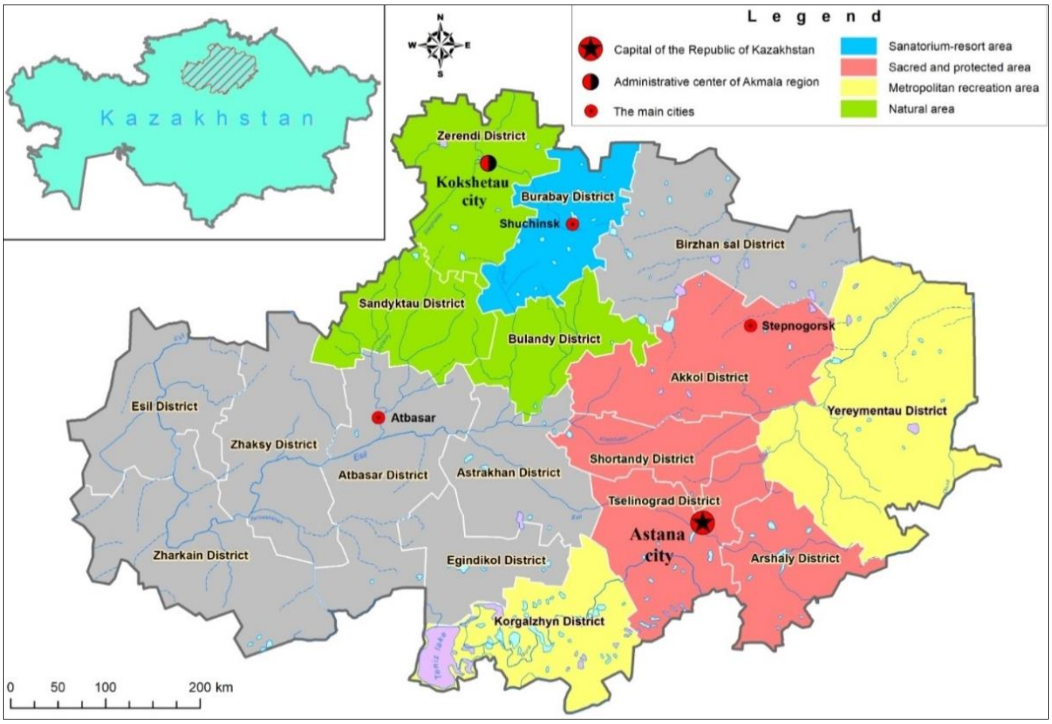


Figure 1. Prospective areas of tourism industry development in Akmola region (Source: Created by the authors)

This study was based on reliable materials from national and state libraries and scientific funds, as well as on scientific articles published in journals in Scopus, Web of Science. A total of 42 literature reviews were conducted, and valuable works of domestic and foreign scientists who studied tourism and recreational resources of Akmola region were analysed. The literature review was conducted from 01.01.2024 to 31.05.2024 at the Kazakh Academy of Sport and Tourism, located in Almaty. Long analytical work allowed to fully and comprehensively assess the tourism potential of Akmola region, to determine and theoretically justify the relevance of this study. In addition, during the research 503 respondents' answers to the questionnaire of 14 pre-prepared questions were received to find out the opinion of the society. The survey questions were distributed to all districts of Akmola region via social networks (WhatsApp, Telegram, Instagram). The survey questions were offered in docs.google.com form to facilitate distribution. The methods used in the study helped to determine the level of satisfaction of local residents and tourism entrepreneurs with the quality of tourism facilities and services in the region (Demirović et al., 2016; Purwono et al., 2024). In addition, the survey provided an understanding of the main objectives and needs of tourists visiting the region's tourist sites. The survey questions (Q) were as follows:

Q1. Place of birth (region)?
Q2. What is your gender?
Q3. How old are you?
Q4. Are you satisfied with the current state of natural resources of Akmola region (rivers, forests, lakes)?
Q5. In your opinion, what tourist and recreational places in Akmola region have high tourist potential?
Q6. What is the attractiveness of tourist and recreational places in Akmola region?
Q7. What are the disadvantages of tourist facilities in Akmola region?
Q8. In your opinion, is the number of recreation places in Akmola region sufficient for tourists?
Q9. What services do you think are lacking in holiday destinations?

Q10. In your opinion, what measures aimed at nature protection should be carried out on the territory of the region?
Q11. How seriously do visiting tourists care about preserving environmental cleanliness?
Q12. What are the priority directions of agrotourism development in Akmola region?
Q13. Are you satisfied with the level of hotel industry development in Akmola region?
Q14. What suggestions do you have for improving the tourism resources of Akmola region?

The main advantage of using the survey method in the research is that it allows to directly determine the respondents' opinions and suggestions. Therefore, the answers of this survey are effective in determining the level of development of tourism infrastructure and the quality of tourism services in Akmola region. In discussing the survey results, statistical data was used to help understand the current state of development of tourist facilities in the region, tourism infrastructure and general level of service. Statistical data were obtained from the reports of the Agency of the Republic of Kazakhstan on Statistics. Also in the course of the study the areas of potential directions of tourist development of the region were identified using the cartographic method. Taking into account demographic, economic and infrastructural factors, in what direction the development of tourism in Akmola region is forecasted in the future.

Proposals for improving the tourism sector in Akmola region have been developed, including improving infrastructure, introducing new tourist routes and improving the quality of services. This study will serve as a basis for the development of specific proposals for tourism development in the region and will help to make decisions aimed at increasing the impact of tourism on the regional economy (Chernyshev et al., 2023). The methods used in this study have their significance, especially since the survey method allowed us to directly find out the needs of the population in tourism services and their level of satisfaction. This has also made it possible to identify the main problems and directions of the region's development, make accurate forecasts for the future and propose specific steps to improve tourism (Gajić et al., 2023). It will be the basis for the creation of a comprehensive strategy for the development of the tourism industry in Akmola region. The flowchart of this research in full is presented in Figure 2.

Figure 2. Research Flowchart (Source: Compiled by the authors)

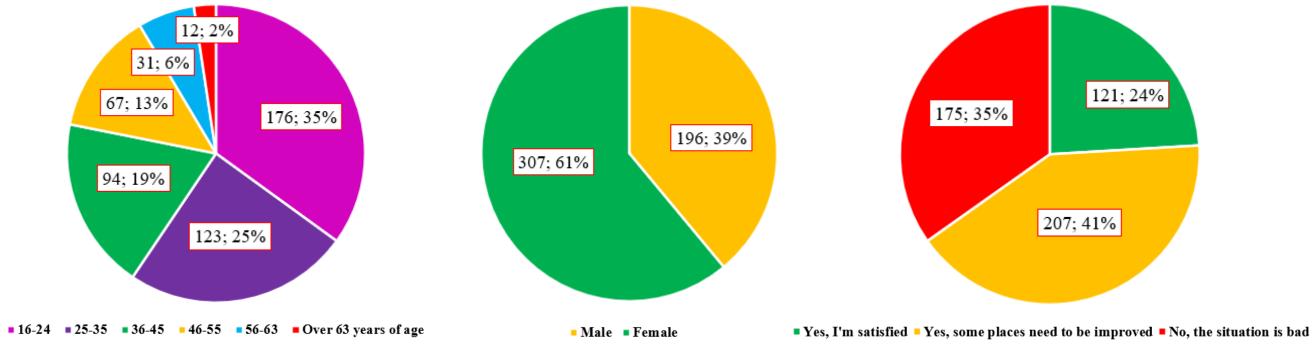
RESULTS AND DISCUSSION

As a result of studying the dynamics of development of tourism and recreational resources of Akmola region it was found that the region has great potential for the development of agrotourism, ecotourism, ethno-tourism and cultural tourism. The Imantau-Shalkar resort area and historical monuments and tourist sites of the Ayirtau district are of particular interest to both foreign and domestic tourists. However, lack of infrastructure and poor quality of services are some of the main obstacles. Tourism experts note the need to improve roads, develop hotels and recreational facilities, and promote tourism to effectively utilise the natural and cultural resources of Akmola region. Also, respondents note that through the development of sustainable tourism with the preservation of environmental and cultural values across the region, it is possible to contribute to the economy of the region and improve the quality of life of the population. This is evidenced by the answers to the questions of questionnaires, in which the residents of Akmola region (503 respondents) took part. At that, 31.2% of respondents who took part in the survey were residents of Akmola region (Table 1).

Table 1. Residential address of respondents who took part in the survey (Source: Authors research)

Economic regions of Kazakhstan	Regions	Number	Percentage (%)
North-Kazakhstan	North Kazakhstan	32	6.3
	Pavlodar	13	2.6
	Kostanay	8	1.6
	Akmola	157	31.2
East Kazakhstan	East Kazakhstan	52	10.3
	Abay	3	0.6
Central Kazakhstan	Karaganda	21	4.2
	Ulytau	4	0.8
South Kazakhstan	Almaty	11	2.2
	Zhetysu	3	0.6
	Zhambyl	16	3.2
	Turkestan	43	8.5
	Kyzylorda	27	5.4
West Kazakhstan	Aktobe	16	3.2
	Atyrau	9	1.8
	West Kazakhstan	12	2.4
	Mangystau	15	3.0
Cities of republican significance	Almaty city	9	1.8
	Astana city	38	7.5
	Shymkent city	14	2.8
Total		503	100

In addition, 31.3% of respondents were aged 16-24 years, while 18.8% were respondents aged 25-35 years (Figure 3A) and 61% of respondents by gender were female (Figure 3B). Of all respondents, 44.4% were dissatisfied with the current state of natural resources in Akmola region (rivers, forests, lakes) (Figure 3C).



A B C

Figure 3. Information on respondents: A) age B) gender C) attitudes towards current natural resources (Source: Authors research)

The survey asked the question: ‘In your opinion, what tourist and recreational places in Akmola region have high tourist potential?’, as a result 43.1% of respondents gave the answer Burabai National Park. The share of those who chose Kokshetau National Park was 28.2%, and those who chose Buiratau - 16.5% (Figure 4).

In this regard, it is natural that the largest number of votes was received by the National Park Burabai, because the National Park Burabai is known throughout Kazakhstan and is a famous park, on the territory of which there are 14 lakes. The lakes of the Burabai resort area, the rivers Zhukey, Katarkol, Maibalyk, Bolshaya and Malaya Shybysh can compete with the famous resorts of the CIS countries in terms of the beauty of the landscape, ideal recreation places. These findings are consistent with the results of Artemyev et al. (2025), who, in their study of the tourist and recreational load in Kolsai Lakes National Park in Kazakhstan, also identified a high perceived natural value of the destination among visitors, alongside concerns related to accessibility and sustainable use of the area. Their analysis suggests that the physical attractiveness of a location is a strong driver of tourist demand, yet the lack of infrastructure and controlled access leads to uneven usage and potential disruption of ecological balance. A similar dynamic was observed in this study, particularly regarding the recognizability of Burabai Park and respondents’ simultaneous statements about the lack of quality services and access infrastructure. This confirms the importance of balanced development that simultaneously ensures the preservation of natural value and the improvement of service capacities.

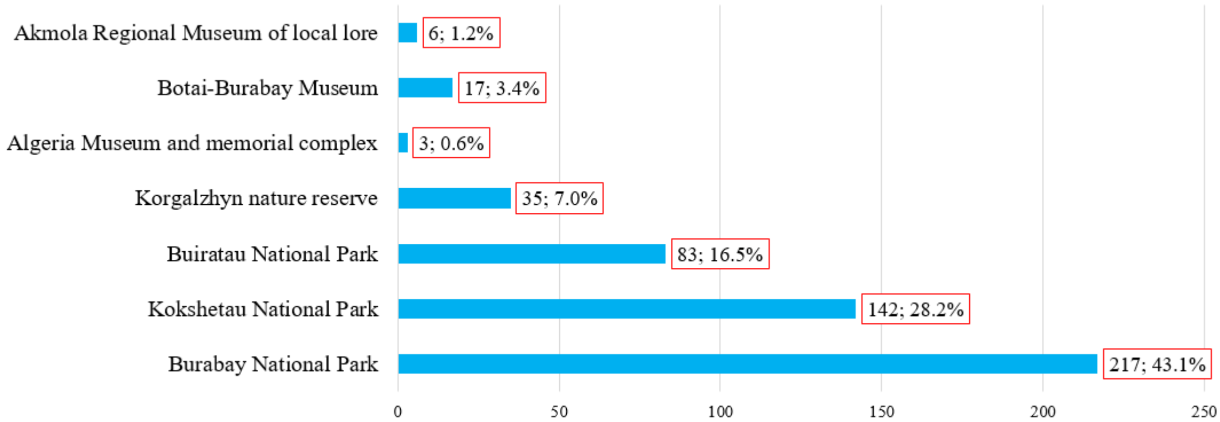


Figure 4. Main tourist attractions in Akmola region (Source: Authors research)

What is the attractiveness of tourist and recreational places in Akmola region? to the survey question 57.1% of respondents answered unique nature, and 26.2% answered there are no ecotourism opportunities (Figure 5A). After all, Akmola region has a diverse landscape that includes unique nature: mountains, lakes, rivers, forests and steppes.

These names create excellent opportunities for various outdoor activities and excursions, such as hiking in the mountains, fishing, hunting, cycling and much more (Issakov et al., 2024). In addition, Akmola region can offer various opportunities for recreation and entertainment and be attractive to tourists from all over the world. In recent years, the region has been actively developing tourism infrastructure. New hotels, restaurants, cafes, tourist equipment rental outlets and many other things have appeared here. However, some tourist sites in the region are poorly equipped, for example, there are no comfortable resting places or lack of information signs. Some tourist sites have difficulties with access due to lack of roads or public transport. What are the disadvantages of tourist facilities in Akmola region? 34.4 % of respondents answered that the lack of quality services and 33.6 % insufficient infrastructure (Figure 5B). This is because in tourist destinations the choice of free time for visitors may be limited, reducing their appeal.

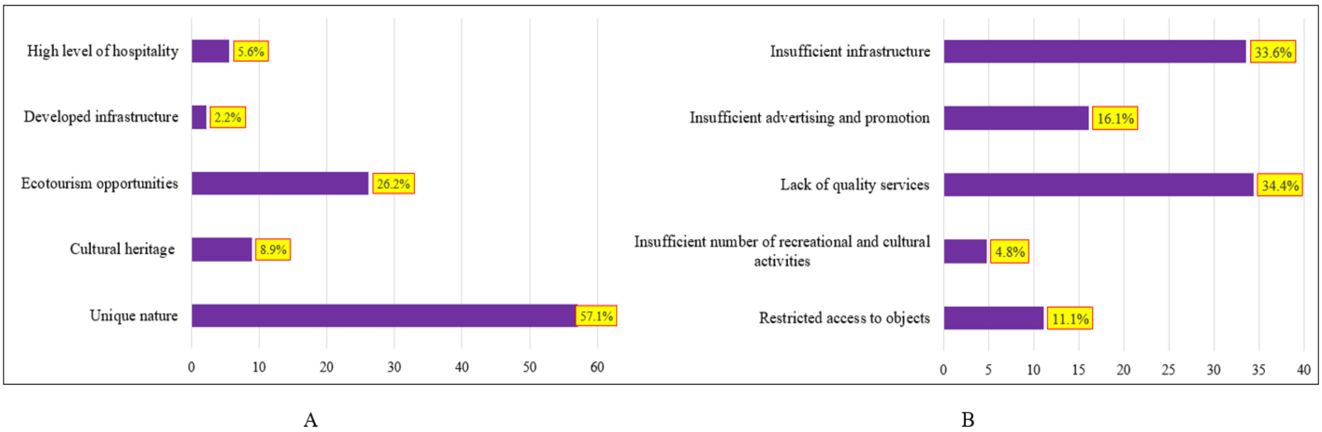


Figure 4. Attractiveness (A) and disadvantages (B) of tourist and recreational destinations in Akmola region (Source: Authors research)

Similar observations regarding the importance of natural attractions, as well as infrastructural shortcomings, were noted by Karshalova et al. (2025), who emphasized that many regions of Kazakhstan suffer from a pronounced imbalance between rich natural resources and the actual capacity to develop them for tourism purposes. Their analysis confirms that physical and landscape diversity is a key advantage, but without investment in infrastructure and service quality, this potential remains largely untapped. Additionally, Gulnur & Kamshat (2025), in their study on sustainable tourism in the Balkhash-Alakol region, identified comparable challenges highlighting the ecological value of the territory alongside the absence of informational infrastructure and accessibility. Their findings suggest that the lack of modern signage, rest areas, and access roads is one of the main obstacles to longer tourist stays an insight also confirmed by our study. This reinforces the conclusion that tourism development cannot rely solely on natural resource endowments but requires systematic and coordinated infrastructural and institutional support.

However, Akmola region is a diverse and beautiful region offering a variety of tourist and recreational attractions. Such sights as the ancient settlement of Bozok, rich in history and culture, Auliekol ethnographic museum, the famous Korgalzhyn state nature reserve, included in the UNESCO World Heritage list, are very popular (Toktarova et al., 2021; Vardar et al., 2025). The region has tourist sites that allow for hiking, camping and wildlife. These places offer opportunities for skiing, skating and snowboarding in winter and hiking, horseback riding and fishing in summer. Overall, the appeal of Akmola region's tourist and recreational destinations lies in its diverse natural beauty, rich history and culture, and the wide range of outdoor activities that visitors can enjoy (Dziekański et al., 2024).

However, the survey showed that "In your opinion, is the number of recreation places in Akmola region sufficient for tourists?" 73.2% of respondents answered "not enough" and 26.8% answered "enough" to this question. To the next question 'What services do you think are lacking in holiday destinations?' the majority of respondents (42.3%) answered that they lacked accessible transport services and guides and tour guides (37.2%) (Table 2).

Table 2. Activities to be improved in recreational facilities (Source: Authors research)

Types of activities	Description	Number	Percentage (%)
Medical services	Primary health care centres or dispensaries should be available to provide medical assistance to injured or sick tourists	9	1.8
Transport services	Public transport (buses, minibuses, minibuses) should be organised to enable tourists to move easily between different attractions and hotels.	213	42.3
Guides and tour guides	There is a lack of qualified guides who can provide information about local attractions, the history of the region and the culture of the peoples living in the area	187	37.2
Entertainment services	Various entertainment and animation such as cultural performances, sporting events and theme parties should be developed for tourists	32	6.4
Facilities for children	For young tourists, playgrounds, animators and entertainment programmes are needed to make the holiday comfortable for the whole family	62	12.3
Total		503	100

In this regard, there is a need to develop spas, sports games, diving, fishing and other activities in holiday destinations. After all, the quality of services provided for these types of services does not correspond to the established amounts of funding, and it is expensive. Due to high competition, manapol is in a situation where tourism is not developing at the proper level. These findings align with the results of Pyagay et al. (2025), who examined the implementation of eco-innovative strategies in Central Asian tourism SMEs and observed that one of the main limiting factors is not the absence of natural attractions, but the lack of functional support systems that enhance the overall visitor experience. Their analysis underlined that insufficient transport connections, limited availability of professional guiding services, and underdeveloped local infrastructure significantly reduce the competitiveness of regional destinations. Similar to our results, respondents in their study emphasized the need for strategic investment in mobility and interpretative services to better support both domestic and international tourism flows.

In the context of Akmola, this further confirms that the region's current shortcomings are not resource-based but system-based, reinforcing the need for comprehensive tourism development planning. In addition, to strengthen environmental protection measures on the territory of the region, 18.3% of respondents consider it necessary to 'reduce and recycle waste', while 16.1% - 'create protected natural areas' and 14.5% - 'biodiversity protection programmes' (Table 3). After all, the installation of containers for separate waste collection and recycling is a requirement of the time. It is also necessary to implement effective programmes for the conservation of rare species of plants and animals in the region and the protection of flora and fauna populations.

Table 3. Main areas where environmental protection measures should be implemented in Akmola region (Source: Authors research)

Type of activities	Description of the main environmental protection measures	Number	Percentage (%)
Establishment of protected areas	Increase the number of reserves and natural parks to preserve unique ecosystems and rare species of plants and animals	81	16.1
Land restoration	Restoration of disturbed lands, including restoration of lands subject to erosion or pollution	34	6.8
Reforestation	Organisation of forest plantations and reforestation to combat soil degradation and improve climatic conditions	42	8.3
Water protection	Monitoring and cleaning of water bodies from pollution, protection of fresh water sources, restoration of wetlands	20	4.0
Biodiversity protection programmes	Implementation of programmes aimed at protecting and restoring populations of rare and endangered species of flora and fauna	73	14.5
Environmental education	Conducting campaigns to raise public awareness of the importance of environmental protection, organising environmental tours and the 'Clean Coast' campaign	56	11.1
Sustainable agriculture	Promotion of sustainable farming practices, use of biological fertilisers and reduction in the use of chemical pesticides	18	3.6
Waste Reduction and Utilisation	Development of waste recycling programmes, installation of containers for separate waste collection	92	18.3
Environmental monitoring	Conducting regular research and monitoring of the region's ecology, including air, water and ecosystem conditions	59	11.7
Co-operation with local communities	Involvement of local residents in environmental initiatives, creation of a volunteer movement aimed at nature conservation	28	5.6
Total		503	100

Therefore, these activities can significantly improve the environmental situation in Akmola region, contribute to the sustainable development of the region and tourism development. This is due to the fact that the state of the region's ecology, including the state of air, water and ecosystems, has a very strong impact on tourists visiting the region. Similar perspectives are reflected in the study by Gafforov et al. (2024), who emphasize the importance of biodiversity mapping and species conservation in Central Asia as essential for maintaining ecological resilience in the face of tourism pressure. Their research shows that integrating conservation priorities with tourism planning, particularly in sensitive ecosystems, yields long-term benefits not only for nature protection but also for the sustainability of tourism flows.

In the context of the Akmola region, where tourist interest is increasingly directed toward protected areas such as Korgalzhyn Reserve, the absence of structured biodiversity programmes could lead to unintended ecological degradation. Therefore, as our results confirm, environmental protection is not merely an ethical or legal obligation, but a strategic investment into the long-term viability of tourism in the region. When asked how seriously tourists who came to the territory of Akmola region take the observance of environmental cleanliness, the majority of respondents (57%) expressed disappointment. This is due to the fact that there are a large number of tourists who do not throw garbage in the right place and do not observe safety. Respondents emphasized that due to frequent failure to clean garbage bins, the volume of garbage increases and is released into the environment. Nevertheless, 43% of respondents believe that tourists' adherence to environmental cleanliness depends on a number of factors, including awareness, cultural sensitivity, age, economic status and opportunity. In recent years, there has been a growing interest in ecotourism among travelers, and tourists have a positive attitude towards how they try to follow responsible behavior. As one of the first steps we can mention the use of reusable bottles, bags and other items to reduce plastic waste.

To the next question of the research questionnaire "What are the priority directions of agrotourism development in Akmola region?" respondents offered answers in different variants. Special mention should be made of: creation of favorable conditions for accommodation and recreation in agro-industrial complexes (improvement of transport, hotel and information infrastructure); promotion of organic agriculture and organic production for tourists interested in ecotourism; renewal and popularization of traditional crafts, cuisine and customs of the region; agronomy, traditional farming methods, cooking holding of master classes and educational programs on other aspects of rural life; organization of fairs and festivals; organization of workshops, seminars, seminars, workshops and training programs in the field of agro-industrial complexes. This, in turn, contributes to the development of the region's economy and the preservation of its cultural and natural heritage. These results are supported by the study of Ibragimov et al. (2025), who emphasized that while tourists in Central Asia increasingly express interest in sustainable travel and local cultural experiences, actual environmentally responsible behavior is often inconsistent and shaped by situational factors such as availability of infrastructure, signage, and cultural norms. This aligns with our finding that while there is a growing awareness of ecological responsibility, its translation into practice remains limited without systemic support. Furthermore, the responses related to agrotourism development are consistent with the research of Kanatuly et al. (2025), who advocate for the revitalization of traditional rural practices—including organic farming, craft production, and local cuisine—as core pillars of sustainable tourism in East Kazakhstan. Their findings confirm that integrating cultural heritage and ecological practices through rural tourism not only enhances the attractiveness of destinations but also supports local economies and strengthens regional identity.

Are you satisfied with the level of hotel industry development in Akmola region? according to the survey, 71% of respondents are not satisfied, 18% are satisfied. The remaining 11% of respondents chose the answer that they find it difficult to answer, because they do not know the level of development of the hotel industry. It should be taken into account that the largest number of hotel facilities in the country falls on East Kazakhstan region (15.6%), Almaty region (14.9%) and Akmola region (11.2%). According to the results of 2023, the greatest growth in the number of hotel facilities was received by Almaty city (+28.7%), the greatest growth by regions-Turkestan (+18.3%), Kyzylorda region (+15%) and Akmola region (+14.3) (National Bureau of Statistics, 2024). In addition, we see positive dynamics of hotel development in Akmola region. However, the fact that 71% of respondents answered that they are dissatisfied is directly related to the higher cost of services in hotels. The reason is that hotels have high prices for rent and room service (Table 4).

Table 4. Hotels (Source: Authors research)

№	Hotel name	Guest feedback Booking.com (10)	Minimum price, euro	Hotel category
1	Hotel Kokshetau	9.1	47	4*
2	Hotel Kokshe Inn	8.2	30	-
3	Dostyq Kokshetau	7.9	45	-
4	Plaza Hotel	7.9	43	3*
5	Green Which Hotel	8.1	70	4*
6	House by the lake	9.3	120	4*
7	Hotel Burabay	7.8	75	-
8	Hotel Palladium	8.5	80	3*
9	Park Hotel Kokshetau	8.6	75	4*
10	Sultan Plaza Borovoe	8.7	82	4*
11	Park House	8.1	75	4*
12	Aisha Bibi Hotel & Spa Burabay	8.8	90	-
13	Strawberry meadow Borovoe	8.1	115	-
14	Rixos Borovoe	9.1	200	5*
15	Rufus Lodge	9.3	90	4*

These results are in line with the analysis by Vardar et al. (2025), who explored the relationship between economic policy uncertainty and capital investment in tourism firms across several regions, including Kazakhstan. Their findings emphasize that although hotel infrastructure may expand in quantitative terms, it often lacks corresponding improvements in affordability and service quality, especially in regions where tourism policy is not strongly integrated with local economic planning. In this context, the dissatisfaction expressed by respondents in our survey reflects not only price sensitivity but also the perceived mismatch between price levels and service standards.

This calls for more targeted strategies to incentivize investment in mid-range and budget accommodation facilities, which would make the Akmola region more accessible to a broader spectrum of tourists and reduce the gap between development metrics and visitor satisfaction. The survey "What suggestions do you have for improving the tourism resources of Akmola region?" 50.5% of respondents believe that it is necessary to develop infrastructure (Figure 5). Among the main tasks are road repairs, ensuring accessibility of public transportation and tourist routes.

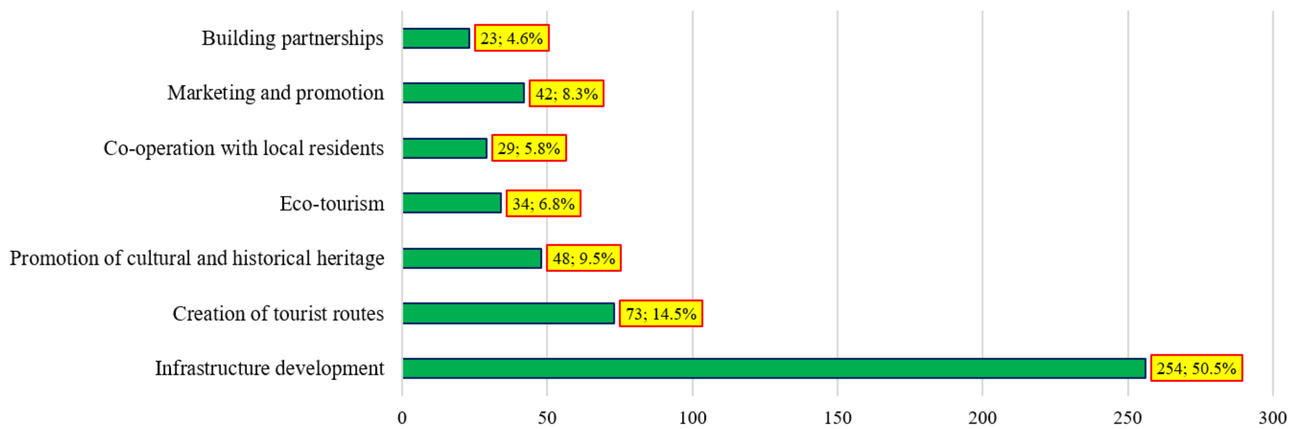


Figure 5. Recommendations of respondents to improve tourism resources of Akmola region (Source: Authors research)

The importance of infrastructural development as a precondition for regional tourism growth has also been highlighted by Tashpulatova & Suyunova (2025), who emphasized that inadequate transport connectivity and poor accessibility remain some of the most persistent barriers in Kazakhstan's tourism landscape. Their findings echo our survey results, pointing out that road quality and lack of public transportation options significantly limit both the mobility of tourists and the spatial distribution of tourism flows. In addition, Karshalova et al. (2025) underline that infrastructure investment must go beyond basic physical access and include digital infrastructure, signage, and visitor facilities in order to support a truly integrated and inclusive tourism system. Taken together, these findings reinforce the view that infrastructure development is not only a technical requirement, but a strategic tool for unlocking the broader tourism potential of regions such as Akmola.

Besides, to improve the tourist resources of Akmola region 14.5% of respondents consider it necessary to create tourist routes. The region is very suitable for ecotourism, cultural and historical excursions and development of outdoor routes (bicycle, hiking routes). Also, to promote cultural and historical heritage, 9.5% of respondents believe that it is necessary to organize festivals, fairs and other events that attract tourists and familiarize them with the culture of the region. While on marketing and advertising, respondents (8.3%) consider it useful to develop information materials and advertising campaigns to attract tourists from regions and countries. In this regard, the active use of social networks and online platforms will be beneficial for the promotion of tourism resources (Table 5).

Table 5. Means of advertising distribution (Source: Authors research)

Methods	Types of advertising	Price	Entering the target audience
1	2	3	4
Information tools	Television	High (-)	Low (-)
	Radio		
Internet network	News Sides	Low (+)	High (+)
	Facebook		
	YouTube		
	Instagram		
	Tik-Tok		
	Others		
Outdoor and indoor advertising constructions	Billboards	Average (±)	Low (-)
	Video screens		
	Roller Displays		
	Electronic signage		
	Poster stands		
PR-events	Presentation	Average (±)	Average (±)
	Conference		
	Briefing		

These suggestions are aligned with the conclusions of Gulnur & Kamshat (2025), who underscore the need for destination-specific thematic products such as cultural festivals, historical trails, and local fairs as effective tools to reinforce regional identity and stimulate sustainable tourism in underdeveloped areas of Kazakhstan. Their research confirms that integrating cultural programming into tourism development not only diversifies the offer but also strengthens community engagement and economic inclusion. Additionally, the emphasis on digital promotion in our survey corresponds with the findings of Nadeem et al. (2025), who highlight the transformative role of social media and sentiment analysis in shaping tourist preferences and destination image. According to their analysis, regions that invest in targeted, data-informed digital campaigns are significantly more likely to attract visitors from both domestic and international markets. Therefore, the responses in our study reinforce the necessity of combining physical development of tourist routes with modern digital outreach strategies in order to maximize the visibility and competitiveness of the Akmola region.

Thus, Akmola region is characterized by natural and climatic features, historical and cultural heritage, recreational potential. This region has a number of resources that create favorable conditions for the development of various types of tourism (Yushina & Yegemberdiyeva, 2019). Effective use of tourism and recreational resources not only positively affects the economy of the region, but also contributes to its socio-cultural development. In the study of tourism and recreational resources of Akmola region, first of all, natural resources are highly appreciated (Yegemberdiyeva et al., 2020). The geographical location, climatic features of the region, forest-steppe and forest zones, lakes and rivers provide great opportunities for ecological and nature tourism. Lakes in the region (e.g. Shalkar and Imantau lakes) are becoming more and more attractive for organizing beach recreation, fishing and water sports. Natural reserves and national parks create a full opportunity for the development of ecotourism (Mukanov et al., 2023; Dziekański et al., 2024). Moderate continental climate, warm weather in summer and snowy weather in winter allow organizing various seasonal recreation activities. Winter in the area is ideal for winter sports such as skiing and ice skating (Rogerson et al., 2024). In addition, the spring and fall seasons allow tourists to engage in outdoor activities such as bird watching and hiking.

Another important part of the tourist and recreational potential of Akmola region is its historical and cultural heritage. The region has archeological monuments of ancient times, places associated with historical events of the Kazakh people. For example, the sites of the Botai culture are important for tourists interested in learning about ancient human history. This culture is recognized as the first center of horse domestication by mankind and is an important site for archaeological tourism (Baigunakov & Sabdenova, 2022). In addition, historical towns and villages associated with the historical periods of the Kazakh Khanate and the Russian Empire provide great opportunities for the development of cultural and cognitive tourism (Ayzhan et al., 2021). Infrastructural support plays an important role for the effective use of tourist and recreational resources of Akmola region. At present, some areas of the region have underdeveloped hotels, recreation centers, roads and transportation systems suitable for tourists. Joint efforts of the state and the private sector need to be strengthened to address this problem (Issakov et al., 2023b). It is necessary to develop programs for the development of ecological and cultural tourism in the region, involve local communities in this process and take measures to increase their profits. Further study and development of tourist and recreational resources of Akmola region will not only improve the economic situation of this region, but also preserve its environmental sustainability. By increasing the inflow of tourists, it is possible to improve the social and cultural level of the region.

CONCLUSIONS

The research on tourism development in the Akmola region has shown that, despite its significant natural and cultural wealth, the potential of this area remains insufficiently utilized. Data obtained through statistical analysis and local community surveys reveal the presence of favorable predispositions, yet also expose a range of developmental barriers that prevent the transformation of the region into a competitive and sustainable tourism destination. The findings suggest that synergy between infrastructural investment, institutional support, and local community engagement could substantially contribute to the region's socio-economic progress and enhance its relevance within the national tourism.

Theoretical and practical implications

This study contributes to the theoretical understanding of tourism development in post-socialist and peripheral contexts, particularly those in Central Asia, which are often underrepresented in academic discourse. By applying a mixed-method approach, the research moves beyond dominant descriptive and normative models, offering a more nuanced analysis of the relationship between geographic space, institutional structures, and social perceptions. The research highlights the need for new conceptual frameworks that more accurately reflect spatial inequalities, institutional fragmentation, and transitional challenges. Importantly, it emphasizes not only the developmental potential of natural resources but also the critical role of local communities as active agents in destination transformation.

On a practical level, the findings of this study offer valuable insights for policymakers, planners, destination managers, and local governance actors. The identified weaknesses including inadequate infrastructure, limited destination visibility, fragmented coordination among local stakeholders, and underdeveloped institutional frameworks signal key areas for intervention in regional tourism strategies. As such, the study serves as a diagnostic tool for regional development and tourism planning. The survey data also highlight a strong readiness among the local population to engage in tourism initiatives, creating an opportunity to implement participatory tourism governance models.

The suggestions related to seasonal diversification, the development of thematic routes (eco-tourism, ethnographic tourism, cultural tourism), digital promotion, and workforce training stem directly from the needs identified in the research. These findings enable the creation of an integrated approach that encompasses spatial, human, and institutional resources in shaping a competitive and sustainable destination.

Limitations of the study and directions for future research

Despite its scope and relevance, this study is subject to certain methodological and geographic limitations. The spatial focus on the Akmola region limits the generalizability of the results to other areas of Kazakhstan or Central Asia. Methodologically, the study relies primarily on secondary statistical sources and a community-based survey, which may be affected by the quality, consistency, and availability of official data, particularly at the sectoral level. Moreover, the study's temporal framework did not allow for the observation of seasonal variations in tourism activity or the analysis of long-term trends. The use of a questionnaire, while effective for gathering perceptions from the local population, did not capture the views of other critical stakeholders such as domestic and international tourists, entrepreneurs, or public officials. This leaves an important dimension of tourism supply, demand, and inter-sectoral governance unexplored.

Future studies should expand the spatial and thematic scope of analysis. Comparative studies across different regions of Kazakhstan and Central Asia would enable a deeper understanding of various developmental pathways and institutional arrangements. It is recommended to integrate qualitative methods such as semi-structured interviews with stakeholders, case studies, and field ethnography to enrich the analytical perspective.

Furthermore, the use of Geographic Information Systems (GIS) could enhance spatial analysis of resources, tourist flows, and environmental pressures. Future research should also incorporate climate risk assessments, destination resilience analysis, and evaluations of the ecological footprint of tourism to strengthen sustainable planning models. Special focus should be placed on assessing the effects of digital transformation on destination management, as well as mechanisms for including local communities in decision-making processes. Multidisciplinary and transdisciplinary approaches combining geography, economics, sociology, tourism, and public policy represent the most promising pathway for generating comprehensive solutions in complex territorial contexts such as the Akmola region.

Author Contributions: Conceptualization, Y.D. and T.G.; methodology, Y.D. and T.G.; software, Y.D. and T.G.; validation, Y.D. and D.K. and A.A.; formal analysis, Y.D. and T.G. and D.Z.; investigation, Y.D. and D.K. and Y.I.; data curation, Y.D. and T.G. and Y.I.; writing - original draft preparation, Y.D. and D.K. and Y.I.; writing - review and editing,

Y.D. and A.A. and D.Z.; visualization, A.A. and D.K. and D.Z. and Y.I.; supervision, Y.D. and D.K. and T.G.; project administration, Y.D. and T.G. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgments: This research was supported by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia (Contract No. 451-03-136/2025-03/200172).

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Aitzhanova, M., & Zhaparova, S. (2023). Environmental Risk Assessment of Spring Floods in the Akmola Region of Kazakhstan. *International Journal of Sustainable Development & Planning,* 18(10), 3333-3339. https://doi.org/10.18280/ijsdp.181033

Akiyanova, F., Atalikhova, A., Jussupova, Z., Simbatova, A., & Nazhbiev, A. (2019). Current state of ecosystems and their recreational use of the Burabai National Park (Northern Kazakhstan). *Eurasian journal of biosciences*, 13(2), 1231-1243. https://www.researchgate.net/ publication/ 339472093_Current_state_of_ecosystems_and_their_recreational_use_of_the_Burabai_National_Park_Northern_Kazakhstan

Alatawi, I. A., Ntim, C. G., Zras, A., & Elmagrhi, M. H. (2023). CSR, financial and non-financial performance in the tourism sector: A systematic literature review and future research agenda. *International Review of Financial Analysis*, 102734. https://doi.org/10.1016/j.irfa.2023.102734

Arifin, S., Azinuddin, M., Mat Som, A. P., Ibrahim, A., & Hanafiah, M. H. (2025). Collaborative communication for sustainable tourism in Asia: A case study from Madura Island. *Worldwide Hospitality and Tourism Themes*, *ahead-of-print*(ahead-of-print). https://doi.org/10.1108/WHATT-01-2025-0042

Artemyev, A., Abdreyeva, S., Baiburiev, R., Beisakhmet, A., Kaliyeva, A., Abzhapparova, A., Savanchiyeva, A., & Dávid, L. D. (2025). Study of the tourist and recreational load in the "Kolsai Lakes" State National Nature Park, Kazakhstan. *GeoJournal of Tourism and Geosites*, *58*(1), 9–17. https://doi.org/10.30892/gtg.58101-1386

Assylkhanova, A., Mussina, K., Nagy, G., Nassanbekova, S., Kenzhin, Z., & Boros, L. (2025). The Potential for Dark Tourism in Kazakhstan: An Overview of the Former Concentration Camps. *Tourism and Hospitality*, 6(1), 9. https://doi.org/10.3390/tourhosp6010009

Ayzhan, S., Kulyash, K., Kulash, M., Zabira, M., Yerlan, I., & Nurbol, U. (2021). Teaching and Learning Foundation of the Elective Course Cultural Geography. *World Journal on Educational Technology: Current Issues*, 13(4), 1040-1050. https://doi.org/10.18844/wjet.v13i4.6297

Baigunakov, D. S., & Sabdenova, G. E. (2022). From the history of the study of Botai culture. *Cultural landscape of the regions*, 4(5), 8-20. https://dialog-ru.ru/index.php/klr/article/view/162/124

Barlykov, E. K., Tukibayeva, K. B., & Akhmetova, G. T. (2019). Analysis of innovative development of tourism sphere of Astana city and the Akmola region. *Statistics, Accounting and Audit,* (2), 99-104. https://www.elibrary.ru/item.asp?id=41444658

Beisenova, R., Tussupova, K., Tazitdinova, R., Tulegenova, S., Rakhymzhan, Z., Orkeyeva, A., & Zhupysheva, A. (2024). Perceived and Physical Quality of Drinking Water in Pavlodar and Akmola Rural Regions of Kazakhstan. *Sustainability,* 16(17), 7625. https://doi.org/10.3390/su16177625

Bekele, H., & Raj, S. (2025). Digitalization and digital transformation in the tourism industry: a bibliometric review and research agenda. *Tourism Review*, 80(4), 894-913. http://dx.doi.org/10.1108/TR-07-2023-0509

Belgibayeva, Z. Z., Nadyrov, S. M., Zhanguttina, G. O., Belgibayev, A. K., & Belgibayev, A. A. (2020). Tourist flows of Kazakhstan: Statistics, geography, trends. *Bulletin of national academy of Sciences of the republic of Kazakhstan*, 6 (388), 232-239. http://dx.doi.org/10.32014/2020.2518-1467.204

Chernyshev, K. A., Alov, I. N., Li, Y., & Gajić, T. (2023). How real is migration's contribution to the population change in major urban agglomerations? *J. Geogr. Inst. Jovan Cvijić SASA, 73*, 371–378. https://doi.org/10.2298/IJGI2303371C

Demirović, D., Petrović, M. D., Neto Monteiro, L. C., & Stjepanović, S. (2016). An examination of competitiveness of rural destinations from the supply side perspective. *J. Geogr. Inst. Jovan Cvijić SASA, 66*, 387–400. https://doi.org/10.2298/IJGI1603387D

Dodds, R. (2025). Balancing tourism development and sustainability: A multi-stakeholder approach in Tofino over 15 years. Sustainability, 17(2), 609. https://doi.org/10.3390/su17020609

Dogru, T., Line, N., Mody, M., Hanks, L., Abbott, J. A., Acikgoz, F., Assaf, A., Bakir, S., Berbekova, A., Bilgihan, A., Dalton, A., Erkmen, E., Geronasso, M., Gomez, D., Graves, S., Iskender, A., Ivanov, S., Kizildag, M., Lee, M., & Zhang, T. (2025). Generative Artificial Intelligence in the Hospitality and Tourism Industry: Developing a Framework for Future Research. *Journal of Hospitality and Tourism Research*, 49(2), 235-253. https://doi.org/10.1177/10963480231188663

Doszhan, R., Anessova, A., & Nurbatsin, A. (2023). Assessment of Trends in the Development of Regional Differences in Kazakhstan. *Eurasian Journal of Economic and Business Studies,* 67(3), 17-32. https://doi.org/10.47703/ejebs.v3i67.284

Dziekański, P., Popławski, Ł., & Popławska, J. (2024). Interaction between pro-environmental spending and environmental conditions and development. *J. Geogr. Inst. Jovan Cvijić SASA, 74*, 329–345. https://doi.org/10.2298/IJGI2403329D

Dziekański, Y., Yarasheva, M., Wang, X. W., Rašeta, M., Rakhimova, Y., Kyzmetova, L., Bavlankulova, K., Rapior, S., Chen, J. J., Langer, E., Munnavarov, B., Aslonov, Z., Bakokhoja, B., & Zhou, L. W. (2024). Annotated checklist of poroid hymenochaetoid fungi in Central Asia: Taxonomic diversity, ecological roles, and potential distribution patterns. *Journal of Fungi*, *11*(1), Article 37. https://doi.org/10.3390/jof11010037

Gafforov, Y., Rašeta, M., Zafar, M., Turgunov, M., Khojimamatov, O., & Makhmudov, A. (2024). Exploring biodiversity and ethnobotanical significance of Solanum species in Uzbekistan: Unveiling the cultural wealth and ethnopharmacological uses. *Frontiers in Pharmacology, 14*, 1287793. https://doi.org/10.3389/fphar.2023.1287793

Gajić, T., Blešić, I., Petrović, M. D., Radovanović, M. M., Đoković, F., Demirović Bajrami, D., Kovačić, S., Jošanov Vrgović, I., Tretyakova, T. N., & Syromiatnikova, J. A. (2023). Stereotypes and Prejudices as (Non) Attractors for Willingness to Revisit Tourist-Spatial Hotspots in Serbia. *Sustainability*,15, 5130. https://doi.org/10.3390/su15065130

Gallardo Vázquez, D. (2023). Attributes influencing responsible tourism consumer choices: Sustainable local food and drink, health-related services, and entertainment. *Oeconomia Copernicana*, *14*(2), 645-686. https://orcid.org/0000000347496034

Gulnur, R., & Kamshat, M. (2025). Defining a sustainable tourism perspectives in eastern part of Balkhash-Alakol Basin. *GeoJournal of Tourism and Geosites*, *58*(1), 32–41. https://doi.org/10.30892/gtg.58103-1388

Ibragimov, K., Marques, J., Flores, R., Jr., & Ramazanova, M. (2025). Evaluating the drivers of outbound tourism: Evidence from Central Asia. *Tourism and Hospitality Management*, *31*(1), 151–155. https://doi.org/10.20867/thm.31.1.11

Im, J., Eastham, R., Kim, H., Miao, L., & West, J. J. (2025). Women executives' inclusion experience and strategies in the hospitality and tourism industry. *Tourism Management*, *108*, 105097. https://doi.org/10.1016/j.tourman.2024.105097

Iskakova, K., Bayandinova, S., Aliyeva, Z., Aktymbayeva, A., & Baiburiyev, R. (2021). The Natural and Recreational Potential of Kazakhstan for the Ecological Tourism Development. *In: Ecological Tourism in the Republic of Kazakhstan*. Springer, Cham. https://doi.org/10.1007/978-3-030-77462-2_2

Issakov, Y., Aktymbayeva, A., Assipova, Z., Nuruly, Y., Sapiyeva, A., Shaken, A., Pavlichenko, L., Kaliyeva, A., Plokhikh, R., & Dávid, L. D. (2023a). Study of the impact of UNESCO heritage sites on sustainable tourism development: a case study of the mausoleum of Khoja Ahmed Yasawi, Turkestan. *GeoJournal of Tourism and Geosites*, 51(4spl), 1717–1727. https://doi.org/10.30892/gtg.514spl12-1167

Issakov, Y., Aktymbayeva, B., Artemyev, A., Kubessova, G., Abdreyeva, S., Surina, A., Tuyebekova, Z., El Archi, Y., Benbba, B., & Dávid, L. D. (2023b). Digital transformation reshaping tourism education: investigating the influence of moocs on teaching tourism fundamentals and local lore. *GeoJournal of Tourism and Geosites*, 49(3), 1015-1026. https://doi.org/10.30892/gtg.49317-1101

Issakov, Y., Omarov, K., Savanchiyeva, A., Kadyrbekova, D., Aldasheva, A., Beken, A., Tokenova, Z., & Dávid, L. D. (2024). Determining the effectiveness of using ChatGPT-4 in organising excursions. *Geojournal of Tourism and Geosites,* 53(2), 502–513. https://doi.org/10.30892/gtg.53213-1225

Kabil, M., Rahmat, E. F., Hegedűs, M., Galovics, B., & Dávid L. D. (2024). Circular Economy and Tourism: A Bibliometric Journey through Scholarly Discourse. *Journal of Circular Economy* 2: (1), Paper: HGWO7144, 21p. https://doi.org/10.55845/HGWO7144

Kadyrbekova, D., Yevloyeva, A., Beikitova, A., Dyussekeyeva, Y., Aktymbayeva, B., Moldagaliyev, A., Issakov, Y., & Dávid, L. D. (2024). Exploring the tourist attractiveness of cultural sites: the case of Kazakhstan. *GeoJournal of Tourism and Geosites,* 56(4), 1627-1636. https://doi.org/10.30892/gtg.56419-1333

Kanatuly, M., Adilbayeva, A., Ramazanova, F., Baigapanova, A., & Kaishatayeva, A. (2025). Genesis and history of tourism development in East Kazakhstan (Late XX to early XXI centuries). *RIVAR*, *12*(34), 95–68. https://doi.org/10.35588/tkcq6j84

Karshalova, A., Akpanov, A., Tleubayeva, S., Zholayeva, M., & Others. (2025). Development of entrepreneurial activity using the integration of human capital and green technologies to optimize the sustainable development of the territories. *Qubahan Academic Journal*, 4(4), 306–317. https://doi.org/10.48161/qaj.v4n4a1022

Kenzhebekov, N., Zhailauov, Y., Velinov, E., Petrenko, Y., & Denisov, I. (2021). Foresight of tourism in Kazakhstan: Experience economy. *Information,* 12(3), 138. https://doi.org/10.3390/info12030138

Koshim, A., Sergeyeva, A., Kakimzhanov, Y., Aktymbayeva, A., Sakypbek, M., & Sapiyeva, A. (2023). Sustainable development of ecotourism in "Altynemel" National Park, Kazakhstan: Assessment through the perception of residents. *Sustainability,* 15(11), 8496. https://doi.org/10.3390/su15118496

Katsaros, K. K. (2025). Employee burnout in the tourism industry during a cultural shift: the role of change uncertainty, change information and meaning-making. *Journal of Hospitality and Tourism Insights*, 8(2), 774-789. https://doi.org/10.1108/JHTI-02-2024-0172

Kurmangozhina, G. (2020). *The mechanism of sustainable socio-economic development of the Akmola region*, Doctoral dissertation, Szent István Egyetem, Gödöllő, Hungary. https://doi.org/10.14751/SZIE.2020.041

Mahmoud, A. B., Fuxman, L., Asaad, Y., & Solakis, K. (2025). Exploring new realms or losing touch? Assessing public beliefs about tourism in the metaverse–a big-data approach. *International Journal of Contemporary Hospitality Management*, 37(4), 1384-1420. http://dx.doi.org/10.1108/IJCHM-09-2023-1515

Mehrad, A., Sharma, K., Patil, R. M., Wilson, W. M., & Moustansir, A. (2023). International Tourism Policy and Development: Indian Tourism Policy. *Journal of Social Sciences Research,* 19, 27-40. https://doi.org/10.24297/jssr.v19i.9386

Mishchuk, H., Czarkowski, J. J., Neverkovets, A., & Lukács, E. (2023). Ensuring Sustainable Development in Light of Pandemic "New Normal" Influence. *Sustainability*, 15, 13979. https://doi.org/10.3390/su15181397

Moldagaliyeva, A., Aktymbayeva, A., Issakov, Y., Assylbekova, A., Kenzhalin, K., Beisembinova, A., Begimova, G., & Dávid, L. D. (2024). Socio-Economic Significance of Tourism Development on the Great Silk Road (Kazakhstan section). *GeoJournal of Tourism and Geosites,* 52(1), 116–124. https://doi.org/10.30892/gtg.52111-1188

Mukanov, A. H., Mussina, K. P., Mutaliyeva, L. M., Sagatbayev, Y. N., Seidualin, D. A., & Abdramanova, G. K. (2023). Formation of Tourist Clusters in Ecotourism Centers: Case of Zerenda Resort Center in Kazakhstan. *Journal of Environmental Management and Tourism*, 14(6), 2641-2658. https://doi.org/10.14505/jemt.v14.6(70).13

Mussina, K., Dulatbekova, Z., Baimbetova, A., Podsukhina, O., & Lemanowicz, M. (2020). The current state and prospects for the development of Akmola region as a tourism destination. *Journal of Environmental Management and Tourism*, 10(8), 1934-1946. https://doi.org/10.14505//jemt.v10.8(40).23

Mutalieva, L. M., Myrzakhan, I. O., & Zhakiya, M. R. (2020). Econometric analysis of the current state of international tourism in Kazakhstan. *Scientific news,* 10 (27), 78-89. https://www.elibrary.ru/item.asp?id=44212572

Nadeem, A., Missen, M. S., Al Reshan, M. S., Memon, M. A., Asiri, Y., Nizamani, M. A., Alsulami, M., & Shaikh, A. (2025). Resolving ambiguity in natural language for enhancement of aspect-based sentiment analysis of hotel reviews. *PeerJ Computer Science*, *11*, e2635. https://doi.org/10.7717/peerj-cs.2635

Pantić, M., Maričić, T., & Milijić, S. (2022). Implementation of the Carpathian Convention in Serbia—The analysis of sustainability aspects. *Journal of the Geographical Institute "Jovan Cvijić" SASA*, *72*(1), 33–49. https://doi.org/10.2298/IJGI2201033P

Purwono, N., Susetyo, D. B., Rijal, S. S., Syaripah, G. K., & Munawaroh, S. (2024). Assessing urban growth in Greater Surabaya using Google Earth Engine: An evaluation of built-up area expansion in Indonesian secondary cities. *Journal of the Geographical Institute "Jovan Cvijić" SASA, 74*(1), 127–138. https://doi.org/10.2298/IJGI230608004P

Pyagay, A., Tatikova, A., & Medeni, T. (2025). Contradictions and patterns of eco-innovative strategies of SMEs in Central Asian countries: Ambivalent dynamics of Kazakhstan. *Journal of Innovation and Entrepreneurship*, *14*(1), 22. https://doi.org/10.1186/s13731

Rakhmetova, D., Nurgaliyeva, A., Yesmagzam, V., Takhtayeva, R., & Khassenova, K. (2024). Priority Directions and Trends of the Business Sector in Tourism: The Case of Kazakhstan. *In: Alareeni, B., Elgedawy, I. (eds) Opportunities and Risks in AI for Business Development. Studies in Systems, Decision and Control, vol 545.* Springer, Cham. https://doi.org/10.1007/978-3-031-65203-5_59

Rogerson, C. M., Malovha, M. C. N., & Rogerson, J. M. (2024). New urban tourism in the Global South: The case of inner-city Johannesburg. *Geosport for Society,* 21(1), 97-114. https://doi.org/10.30892/gss.2103-111

Sadykova, D., Mamirova, K., Asenov, A., Kenzhebaj, R., & Kubessova, G. (2025). Leveraging Astana's Tourism to Build a "Brand City" Reputation. *RIVAR,* 12(34), 109-124. https://doi.org/10.35588/cb84nm08

Seken, A., Mazbayev, O., Agybetova, R., Akimov, Z., & Tleubayeva, A. (2019). Research on the Development Model of Cross Border Kazakh Ethnic Cultural Tourism. *Journal of Environmental Management and Tourism*, 9(8), 1751-1759. https://doi.org/10.14505//jemt.v9.8(32).14

Shaikin, D. N., Abutalip D. O., & Bekmatova, A. Z. (2021). Sustainable economic development of agritourism based on the example of the North Kazakhstan region. *Problems of AgriMarket*, (2), 79-85. https://doi.org/10.46666/2021-2.2708-9991.09

Sharma, G. D., Stanimir, A., Przybysz, K., & Roszko-Wójtowicz, E. (2023). How do European seniors perceive and implement the postulates of sustainable tourism?. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 18(4), 1217-1249. https://doi.org/10.24136/eq.2023.038

Sherimova, N. M., Yesimova, D. D., Kakezhanova, S. K., & Amerxanova, A. H. (2024). Innovative development of the industrial sector of the economy of Pavlodar region: forecasting and priorities. *Bulletin of the University of Toraigyrov, Economic series,* 2, 387-395, https://doi.org/10.48081/UOFS1949

Shulembayeva, K., Rodrigo-Ilarri, J., Rodrigo-Clavero, M. E., Khussainov, A., Kakabayev, A., & Khussainova, R. (2023). Assessment of the Hydrophysical and Hydrochemical Characteristics of Lake Burabay (Akmola Region, North Kazakhstan). *Sustainability*, 15(15), 11788. https://doi.org/10.3390/su151511788

Smagulov, Y. N. (2021). Spatial Differentiation of the Impact of Climate Change on Agriculture in Akmola Oblast. *Arid Ecosystems*, 11(3), 279-286. https://doi.org/10.1134/S2079096121030124

Sudarmanto, E., Raharjo, B. B., Kristiyanto, A., Sulaiman, S., Setyawati, H., Priyono, B., & Jariono, G. (2025). A Systematic Review for The Development of Sustainable Tourism Destinations Based on Sports Tourism. *Retos: nuevas tendencias en educación física, deporte y recreación*, (62), 646-654. http://dx.doi.org/10.47197/retos.v62.108401

Štetić, S., Trišić, I., & Nedelcu, A. (2019). Natural potentials of significance for the sustainable tourism development-the focus on the special nature reserve. *Journal of the Geographical Institute" Jovan Cvijic", SASA*, *69*(3), 279-287. https://doi.org/10.2298/IJGI1903279S

Tashpulatova, L., & Suyunova, F. (2025). Digital transformation of the tourism industry and its impact on export potential: Evidence from Kazakhstan. *Journal of Central Asian Studies*, *23*(1), 40–60. https://doi.org/10.36713/epra17744

Tiberghien, G., Bremner, H., & Milne, S. (2018). Authenticating eco-cultural tourism in Kazakhstan: A supply side perspective. *Journal of Ecotourism,* 17(3), 306-319. https://doi.org/10.1080/14724049.2018.1502507

Tleubaeva, A. T. (2019). Priority directions of development of rural tourism of Akmola region. *Economic series of the Bulletin of L.N. Gumilyov*, (3), 105-115. https://doi.org/10.32523/2079-620X-2019-3-105-115

Tokbergenova, U. A., Abdimanapov, B. S., & Tokpanov, E. A. (2023). Geographical prerequisites for the development of tourism in Kazakhstan. *Vestnik Kaznu. Series geography,* 68(1). https://doi.org/10.26577/JGEM.2023.v68.i1.010

Toktarova, A. A., Ives, C., & Seitkan, A. S. (2021). Management of protected areas: a case study of the Korgalzhyn state nature reserve. *Eurasian Journal of Ecology*, 67(2), 97–105. https://doi.org/10.26577/EJE.2021.v67.i2.10

UNWTO. (2022). Impact assessment of the COVID-19 outbreak on international tourism. UNWTO. https://www.unwto.org

Vardar, N. B., Cifter, A., Erhan, G., & Akay, G. H. (2025). Economic policy uncertainty and capital investment: Evidence from European tourism firms. *Tourism Economics*, *0*(0). https://doi.org/10.1177/13548166251314273

Yegemberdiyeva, K., Temirbayeva, R., Orazbekova, K., Khen, A., & Yushina, Y. (2020). Management of tourist resources based on the use of web-technology on the example of the Akmola region, the Republic of Kazakhstan. *International Multidisciplinary Scientific GeoConference: SGEM*, 20(2.2), 413-420. https://doi.org/10.5593/sgem2020/2.2/s1L049

Yushina, Y., & Yegemberdiyeva, K. (2019). Assessment of tourism and recreational potential of climatic resources of the Akmola region (Kazakhstan). *International Multidisciplinary Scientific GeoConference: SGEM*, 19(5.3), 69-75. https://doi.org/10.5593/sgem2019/5.3/S21.009

Zada, M., Bayram, G. E., Contreras-Barraza, N., Kaptangil, K., & Aylan, S. (2025). Integrating social media-driven service innovation and sustainable leadership: Advancing sustainable practices in tourism and hospitality. *Sustainability*, 17(2), 399. https://doi.org/10.3390/su17020399

Zhang, W., Jia, C., & Liu, Z. (2025). Strategies for enhancing the value of the sports tourism industry supported by multi-sensor network technology. *Wireless Netw*, 31, 1587–1599. https://doi.org/10.1007/s11276-024-03866-3

Zhoya, K., Issakov, Y., Kaimuldinova, K., Sarkytkan, K., Ussenov, N., Muzdybayeva, K., Polishchuk, E., & Dávid, L. D. (2024). Structural model of formation of geoecological competence of tourism students. *Journal of Geography in Higher Education*, 1-25. https://doi.org/10.1080/03098265.2023.2298321

Zvaigzne, A., Litavniece, L., Kodors, S., & Jurkane, K. (2025). Negative impacts of artificial intelligence technologies on the tourism industry. *Worldwide Hospitality and Tourism Themes*, 17(1),22-34. https://doi.org/10.1108/WHATT-12-2024-0299

***National Bureau of Statistics. (2023). Agency for Strategic Planning and reforms of the Republic of Kazakhstan. https://stat.gov.kz/ (In Kazakh).

***National Bureau of Statistics. (2024). Agency for Strategic Planning and reforms of the Republic of Kazakhstan. https://stat.gov.kz/ (In Kazakh).

Article history: Received: 15.03.2025 Revised: 02.06.2025 Accepted: 25.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1362-1371
DOI 10.30892/gtg.602spl31-1507

THE IMPACT OF CULTURAL HERITAGE ON THE DESTINATION ATTRACTIVENESS: THE MEDIATING ROLE OF AUTHENTICITY

Sui Nghiep PHAT[1*], Quoc Nghi NGUYEN [2], Tran Thi Ngoc LIEN [3]

[1] Hue University, School of Hospitality and Tourism, Hue City, Vietnam; suinghiepphat@hueuni.edu.vn, (S.N.P.); Hung Vuong University of Ho Chi Minh City, Vietnam; phatsn@dhv.edu.vn (S.N.P.)
[2] Can Tho University, School of Economics, Can Tho, Vietnam; quocnghi@ctu.edu.vn (Q.N.N.)
[3] Hue University, School of Hospitality and Tourism, Hue City, Vietnam; ttnlien@hueuni.edu.vn (T.T.N.L)

Citation: Phat, S.N., Nguyen, Q.N., & Lien, T.T.N. (2025). The impact of cultural heritage on the destination attractiveness: The mediating role of authenticity. *Geojournal of Tourism and Geosites*, 60(2spl), 1362–1371. https://doi.org/10.30892/gtg.602spl31-1507

Abstract: Authenticity is widely recognized as a core element in heritage and cultural tourism, both as a value sought by tourists and as a critical determinant of destination attractiveness. Prior research has demonstrated a strong association between cultural heritage and authenticity in enhancing tourist experiences and perceptions of destinations. While the concept of authenticity has been the focus of scholarly inquiry for over five decades, there remains a lack of empirical studies investigating this relationship within the Vietnamese context. This study addresses this gap by examining the influence of cultural heritage on perceived authenticity and its subsequent effect on destination attractiveness in Binh Phuoc province, Vietnam. A quantitative research design was employed, using a structured questionnaire distributed to 222 domestic and international tourists visiting Binh Phuoc. The survey measured three main constructs: cultural heritage, authenticity (including object-based and existential authenticity), and destination attractiveness. Data were analyzed using Structural Equation Modeling (SEM) to assess the relationships among these constructs and to test the proposed hypotheses. The analysis confirmed that cultural heritage has a significant positive effect on both object-based authenticity and existential authenticity. Furthermore, both dimensions of authenticity positively influence tourists' perceptions of destination attractiveness. These insights offer meaningful contributions for both theory development and practical strategies in promoting sustainable heritage tourism.

Keywords: Binh Phuoc, cultural heritage, destination attractiveness, object-based authenticity, existential authenticity

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INTRODUCTION

Gravari-Barbas (2018) argues that the demand for heritage tourism has become increasingly pressing in the context of modern society. The assessment of a destination's attractiveness is one of the prevalent topics in heritage tourism research. To shape the quality of the tourist experience and enhance a destination's appeal, authenticity is considered a relevant variable, particularly in the context of heritage cultural tourism (Domínguez-Quintero et al., 2020). The pursuit of authentic experiences by tourists is regarded as one of the dominant trends in the tourism industry (Apostolakis, 2003).

Consequently, numerous studies have linked the authenticity of cultural heritage to tourism destinations. For instance, Shepherd (2002) contends that accepting the causal relationship between tourism and the commodification of heritage necessitates acknowledging a related concept authenticity. This perspective has been endorsed by various researchers (Apostolakis, 2003; Kolar & Zabkar, 2010; Atasoy, 2021). Authenticity is recognized as a universal value and a crucial driving force motivating tourists to embark on long and distant journeys (Cohen, 1988; MacCannell, 1973; Naoi, 2004).

According to Kolar and Zabkar (2010), the study of authenticity is highly beneficial for understanding tourism motivations and behavior, as well as for informing strategic management decisions concerning destination management. When traveling to an authentic destination, tourists are likely to explore its unique characteristics, ultimately leading to a sense of authenticity and psychological connection (Supriono & Yulianto, 2021).

Cultural authenticity related experiences can serve as a positive emotional regulator, fostering favorable perceptions and attitudes toward the destination (Geus et al., 2015). Therefore, it can be hypothesized that there exists a relationship between cultural heritage and authenticity, which in turn influences a destination's ability to attract tourists.

Although the significance of authenticity has been widely acknowledged and the impact of cultural heritage on destination attractiveness has been empirically demonstrated by various scholars, the relationship between these factors and its effect on destination appeal has yet to be fully verified.

Thus, the primary objective of this study is to examine the relationship between cultural heritage and authenticity in relation to the attractiveness of Binh Phuoc, Vietnam as a tourist destination through a quantitative approach. This research adopts a cultural heritage tourism perspective within the context of Binh Phuoc, with the aim of proposing managerial implications to enhance its tourism appeal and improve the destination's image and promotion strategies for the future.

* Corresponding author

LITERATURE REVIEW

Since MacCannell's (1973) seminal work on staged authenticity, the concept of authenticity has become central in tourism studies, particularly in the analysis of tourists' experiences at cultural and historical sites (Wang, 1999; Lu et al., 2015). Authenticity in tourism has evolved to include multiple dimensions, including objective, constructive, and existential perspectives, and has been defined as real, original, traditional, or emotionally meaningful (Sharpley, 1994; Kolar & Zabkar, 2010). In the context of heritage tourism, authenticity is perceived as a key driver of tourist engagement and satisfaction (Ha & Quyen, 2021), often functioning as a foundation for customer value and loyalty (Yi et al., 2017; Cheng et al., 2023). Tourists frequently seek authentic experiences when engaging with cultural heritage sites, driven by motivations linked to nostalgia, education, and cultural immersion (Kim & Jamal, 2007; Bryce et al., 2015). These motivations are closely linked to the symbolic and experiential dimensions of both tangible and intangible heritage (Kim & Littrell, 1999). Recent research highlights that perceived authenticity enhances not only visitor satisfaction but also post-visit behaviors, including destination loyalty and positive word-of-mouth (Cheng et al., 2023; Uslu et al., 2023). While the significance of authenticity has been widely recognized, recent studies have moved beyond its direct impact to explore its mediating role between cultural heritage and destination attractiveness. Zou et al. (2024), for example, demonstrated that perceived authenticity of rural intangible cultural heritage significantly affects tourists' emotional and cognitive images of the destination, thereby increasing its attractiveness. Similarly, Uslu et al. (2023) found that authenticity perceptions strengthen tourists' attachment to cultural destinations and support for heritage conservation efforts. These recent findings underscore the need to integrate both material and immaterial aspects of heritage to create authentic experiences that resonate with visitors. Despite the growing body of literature, several limitations persist. First, most existing studies focus on well established heritage destinations, often overlooking emerging or underdeveloped regions such as Binh Phuoc province in Vietnam.

Second, although many studies acknowledge the importance of authenticity, few adopt a mediational model to examine how authenticity serves as a bridge between cultural heritage and destination attractiveness. This results in a fragmented understanding of authenticity's role within the tourist decision making process. Third, the literature tends to generalize authenticity without differentiating between object-based and existential dimensions, despite evidence suggesting that these may influence tourist perceptions and behaviors in distinct ways (Wang, 1999; Iqbal et al., 2022). Moreover, the context specific nature of authenticity is often underestimated. As Nuryanti (1996) argued, authenticity is inherently subjective, and what is considered authentic by one visitor may not be by another. The rapid commercialization of heritage tourism further complicates this perception, potentially diminishing the integrity of cultural experiences (Iqbal et al., 2022). This issue is particularly relevant in developing countries, where heritage commodification is often viewed as a means of economic development rather than cultural preservation. In light of these research gaps, this study aims to investigate the mediating role of authenticity in the relationship between cultural heritage and destination attractiveness, focusing on an emerging destination Binh Phuoc, Vietnam. By integrating recent empirical findings and applying a structural model to test authenticity's multidimensional influence, this study contributes to a more nuanced understanding of heritage tourism in Vietnam.

THEORETICAL BACKGROUND

Authenticity

According to Atasoy (2021), etymologically, the term "authenticity" originates from the Greek word "authentes" and encompasses two meanings. The first refers to a person with authority, while the second denotes something handcrafted by an individual. In the context of art, this term is associated with the root meaning of something created by a particular artisan or forger and relates to the uniqueness of an artwork (Bendix, 2009). Over time, the concept has been extended to various tourism products and is now widely employed by tourism managers and marketers to manage the brand authenticity of a destination (Ha & Quyen, 2021). External indicators such as decorations, colors, and the overall spatial atmosphere of a destination may influence the overall assessment of its authenticity (Jang et al., 2012). Moreover, original artifacts and activities also serve as markers for evaluating the authenticity of a destination (Grayson & Martinec, 2004). Therefore, destinations where cultural heritage constitutes a core component of the experience provide an ideal context for researchers and management agencies to examine how tourists' perceptions of authenticity influence their evaluation of a destination (Ha & Quyen, 2021).

The act of tourists walking among artifacts in an open space tourist site to observe and experience relics is a key factor attracting them to a destination (Atasoy, 2021). Authenticity is a crucial concept in marketing the cultural heritage of a destination (Kolar & Zabkar, 2010). Consumers make purchasing decisions based on the perceived genuineness of a product or service. Occasionally, manufacturers and marketers utilize authentic imagery to boost sales (Reisinger & Steiner, 2006). The commercialization of traditional cultural aspects can enhance a destination's appeal while simultaneously creating a new synthetic culture for the local community, which carries intrinsic cultural value. Consequently, numerous scholars argue that the quality of a tourist destination is improved through authenticity (Lu et al., 2015; Mura, 2015). Accordingly, the concept of authenticity is described as a driving force behind heritage tourism consumption, whether as an experience or as an individual's perception of an attraction or a specific destination attribute (Apostolakis, 2003). Domínguez-Quintero et al. (2021) explain that the authenticity of cultural heritage can be a crucial factor enabling tourists to attain high-quality experiences at a destination. These perspectives suggest that authenticity significantly influences tourists' overall evaluations and is regarded as a key antecedent of a positive destination image (Naoi, 2004; Frost, 2006). Thus, the authenticity of cultural heritage is considered a determinant of a destination's attractiveness to tourists, and its presentation emerges as a criterion for future tourists in selecting destinations (Atasoy, 2021).

From a consumer-based approach, this study adopts the argument of Kolar & Zabkar (2010) that authenticity is a contextually relevant evaluation shaped by tourists' experiences with a site, culture, object, or destination. Authenticity pertains to tourists' enjoyment and perception of the genuineness of their experiences concerning a cultural attraction. Consequently, research on tourists' authenticity experiences has been categorized into existential authenticity and object-based authenticity (Wang, 2007; Kolar & Zabkar, 2010; Ha & Quyen, 2021). According to Kolar & Zabkar (2010), managers must recognize the distinction between object-based authenticity and existential authenticity, as they pertain to different entities (e.g., objects/products versus personal experiences/existential tourism), necessitating separate considerations. This distinction exists to facilitate deeper research into tourists' authentic experiences at heritage sites.

Object-based authenticity, a concept proposed by Wang (2007), seeks to address debates surrounding tourists' authenticity experiences. It can be understood as tourists' evaluation of the inherent characteristics of objects or their perceptions of these objects. Essentially, the formation of this concept aims to assess whether tourists perceive a particular object as authentic (Ha & Quyen, 2021). In contrast, existential authenticity relates to tourism activities that tourists experience. Wang (2007) suggests that existential authenticity derives from existentialist philosophy, which emphasizes individual existence, freedom, and choice. Similarly, Neumann (1992) argues that one of the primary motivations for travel is the pursuit of life, self-exploration, and the understanding of one's true self.

Destination Attractiveness

Measuring the attractiveness of a destination is essential for understanding the factors that encourage people to travel (Formica, 2002). Lee et al. (2011) agree that the better a destination meets tourists' needs, the stronger its competitive position against other destinations. Therefore, the primary value of destination attractiveness lies in its pull effect, which influences tourists' decision-making (Kim & Lee, 2002). Mayo & Jarvis (1981) further elaborate that destination attractiveness is a combination of the relative importance of personal benefits and the perceived ability of a destination to provide these benefits. This attractiveness is enhanced by specific attributes that define the destination, such as attractions, infrastructure, services, and the people delivering these services. A destination becomes more appealing when it possesses a greater number of desirable attributes (Vengesayi et al., 2009). Thus, one of the most common ways to assess whether a destination is attractive is to examine its key attributes. However, Krešić & Prebežac (2011) argue that the attractiveness of destinations varies depending on the type of tourism and the preferences of visitors. Some attributes may be appealing to certain tourists while being less relevant to others. Consequently, identifying and understanding the factors that influence destination attractiveness is crucial, as they serve as a valuable decision-making tool in planning, marketing, and developing strategies for effective resource allocation (Vengesayi et al., 2009; Hai et al., 2023).

The Impact of Cultural Heritage on the Binh Phuoc destination attractiveness

Cultural heritage experiences have become a key motivator for travel. In heritage tourism literature, many scholars agree that cultural heritage itself is the most influential factor in determining tourist participation (Richards, 2000; Poria, 2006). For instance, Richards (2000) argues that tourists visit heritage destinations for three primary reasons: the historical value of the site, learning and education, and recreation. Similarly, Poria (2001) examined the heritage sites of the Wailing Wall and Masada in Israel and confirmed that the intrinsic characteristics of heritage sites are the core elements of heritage tourism.

Nyaupane et al. (2009) also found that, for cultural heritage sites in Arizona, USA, the primary attraction for tourists was the opportunity to visit archaeological sites, particularly those with well structured heritage interpretation. Yi et al. (2023) argue that heritage sites function as major tourist attractions, and the stronger their appeal, the more capable they are of drawing visitors from greater distances (McKercher, 2002). Palmer (1999) also asserts that heritage designation has become an important tool for attracting visitors to various destinations. The more compelling and engaging the heritage resources at a given destination, the stronger their pull effect on tourists (Apostolakis, 2003). Based on these arguments, the following hypothesis for this study is proposed:

Hypothesis 1: Cultural heritage positively impacts the attractiveness of Binh Phuoc as a tourist destination.

The Impact of Cultural Heritage on Object-Based Authenticity and Existential Authenticity

The cultural heritage of a destination is a cultural configuration that combines tangible elements (e.g., landscapes, buildings, artifacts) and intangible elements (e.g., folklore and traditions) associated with historical and cultural landmarks (Caton & Santos, 2007; Yi et al., 2022). According to Richards (1996), culture and heritage, as a dynamic process, attract tourists seeking authenticity and meaning through their travel experiences.

The relationship between cultural heritage and both existential authenticity and object-based authenticity has been extensively examined (Handler, 1986; McIntosh & Prentice, 1999; Kolar & Zablar, 2010; Ha & Quyen, 2021).

Kim and Jamal (2007) argue that disregarding the significance of cultural artifacts in relation to tourists' authentic experiences would be a mistake. Based on empirical measurements, Kolar and Zablar (2010) conclude that cultural motivators including historical sites, cultural landmarks, and historical events positively influence tourists' perceptions of both types of authenticity, namely object-based authenticity and existential authenticity. This aligns with the findings of Ha & Quyen (2021), who suggest that when tourists appreciate historical buildings, architectural heritage, ancient materials, as well as landscapes, events, and tranquil atmospheres, they derive greater cultural value from the destination. Li et al. (2017) identified that cultural heritage factors (such as architectural heritage, traditional customs, and folklore) positively influence tourists' perceptions of existential authenticity. At destinations, tourists can witness traditional production methods, participate in traditional rituals or cultural performances, purchase souvenirs, and listen to stories or legends (Boyd, 2012; Mura, 2015). These activities distinct from everyday life experiences enable tourists to feel a sense of self fulfillment and freedom from rigid societal roles (Li et al., 2017). Based on these arguments, the following hypotheses are proposed:

Hypothesis 2: Cultural heritage positively impacts existential authenticity.
Hypothesis 3: Cultural heritage positively impacts object-based authenticity.

The Impact of Object-Based Authenticity on the Attractiveness of Binh Phuoc Destination

Object-based authenticity is a concept proposed by Wang (2007) to address debates regarding tourists' experiences of authenticity. Boorstin (1961) suggests that the understanding of authenticity is based on the characteristics, level of experience, and state of the object. Accordingly, authenticity has been conceptualized through three philosophical approaches: objective, constructive, and existential. From an objective perspective, authenticity refers to a scientifically or historically verified artifact either an original or at least a perfect replica (Kolar & Zabkar, 2010). Object-based authenticity, which exists externally to the tourist, is an inherent characteristic of an object, such as a product, an event, a cultural artifact, a monument, or a site (Naoi, 2004; Cook, 2010). In cultural heritage tourism studies, authenticity assessment is based on evaluating various elements of a destination, including lifestyle, activities, artifacts, structures, and products. The extent to which these tourism objects are deemed authentic heavily depends on expert evaluation. An asset is deemed authentic based on professional knowledge, and objective authenticity is recognized when tourism objects are certified by credible sources (Ha & Quyen, 2021). For instance, historical revolutionary sites in Binh Phuoc, such as Ta Thiet Base, possess objective authenticity because they have been carefully assessed by experts in the field and officially recognized by the Vietnamese government as a national special relic.

Meanwhile, constructive authenticity offers an alternative perspective, arguing that reproduced or reconstructed objects can still be perceived as authentic (Cohen, 1988; King, 2006). According to constructivist theory, reality is an outcome of human interpretation and construction, making it non static (Wang, 1999). Each person may interpret the visited objects differently and assess their authenticity based on their knowledge (Grayson & Martinec, 2004). This implies that constructive authenticity is achieved through subjective interpretation rather than inherent attributes. For example, although structures at Ta Thiet Base have been restored, they have become an integral part of the heritage site. Over time, they attain authenticity (Reisinger & Steinner, 2006). Ha & Quyen (2021) argue that a fundamental aspect shared by both objective and constructive authenticity is the essential role of tangible objects in shaping authenticity. Waitt (2000) and Naoi (2004) suggest that authenticity primarily relies on the physical attributes of a tourism destination. Regardless of how authentic these attributes are, tourists require tangible cues upon which they base their evaluations. Most tourists lack the expertise to make professional assessments of objective authenticity. Consequently, Wang (2000) proposed object-based authenticity, which encompasses both objective and constructive dimensions. This concept is designed to determine whether tourists perceive a particular object as authentic (Ha & Quyen, 2021). Accordingly, visiting and examining cultural heritage sites that ensure object-based authenticity (both objective and constructive) serve as a key factor in the attractiveness of a tourism destination. Based on these arguments, the following hypothesis is proposed:

Hypothesis 4: Object-based authenticity positively impacts the attractiveness of Binh Phuoc as a tourism destination.

The Positive Impact of Existential Authenticity on Destination Attractiveness

Existential authenticity is a concept related to the activities and experiences tourists undergo during their travels (Leigh et al., 2006). Wang (1999) argued that existential authenticity is a subjective experience, serving as an alternative mode of tourism that emphasizes tourists' openness to their experiences within the constrained spaces that tourism offers (Brown, 2013). Accordingly, Wang (2000) introduced two dimensions of existential authenticity: Intrapersonal authenticity (self-feelings and self-making) and Interpersonal authenticity (family and community relationships). Emotions and experiences associated with existential authenticity are socially constructed (Olsen, 2002). Tourists perceive existential authenticity by forming relationships with places, spaces, objects, and themes in tourism (Ram et al., 2016; Yi et al., 2018). This entails seeking authentic experiences through sensations, emotions, relationships, and self-exploration (Boyd, 2012).

In other words, existential authenticity is a subjective feeling, a perspective, and a dimension that enhances the attractiveness of a tourist destination. For instance, Daniel (1996) observed that although the modern rumba dance differs significantly from its original form, the passion of the dancers influences tourists, immersing them in the performance and allowing them to experience a sense of exhilaration and self-expression. Applying Daniel's (1996) example to Binh Phuoc's historical revolutionary sites, such as Ta Thiet Base, tourists may not see the original war era bunkers, as they have been renovated. However, through engaging guidance from site staff, tourists can try crawling into the bunkers and experiencing a simulation of wartime conditions. This immersive interaction creates unique and emotional experiences, helping visitors deepen their understanding of Vietnam's wartime history. Thus, the proposed hypothesis is:

Hypothesis 5 Existential authenticity positively impacts the attractiveness of Binh Phuoc as a tourism destination.

The Mediating Role of Object-Based Authenticity and Existential Authenticity in the Relationship Between Cultural Heritage and Destination Attractiveness

Fritz & Lester (2016) define a mediating variable as one that explains the relationship between an independent and a dependent variable. In other words, a mediator helps clarify why an independent variable affects a dependent variable. Empirical research by Kolar and Zabkar (2010) demonstrated that authenticity is not an independent concept but should be understood as a mediating factor between cultural motivation and tourists' perceptions and behaviors regarding a destination. Based on these findings and previous hypotheses related to authenticity, this study proposes that authenticity serves as the central link between cultural values and destination attractiveness. Naoi (2004) argued that physical artifacts are crucial for perceived authenticity in heritage sites. However, rather than directly evaluating authenticity based on the originality of objects, Steiner & Reisinger (2006) and Kolar & Zabkar (2010) emphasized that authenticity can be reconstructed through material objects, for example, how these artifacts inspire visitors. The role of authenticity lies in evoking emotions, perceptions, and connections to history rather than solely preserving original artifacts. Research shows that tourists often seek unique experiences in heritage tourism (Ram et al., 2016). Their perception of authenticity can provide deep insights into whether a destination is attractive or not (Ramkissoon & Uysal, 2010).

Furthermore, object-based authenticity provides physical reassurance that tourists will have a consistent experience in future visits (Ariffin & Mansour, 2018). When tangible evidence supports authenticity, tourists gain confidence in recommending the destination to others. For example, Viking heritage sites in Europe have been recreated to enhance tourism (Halewood & Hannam, 2001). These sites offer authentic Viking era experiences, including historical costumes, goods, and events (Coşkun, 2021). This reconstruction of material authenticity attracts tourists seeking a historical experience, demonstrating that object-based authenticity enhances destination attractiveness. Thus, the proposed hypothesis is:

Hypothesis 6: Object-based authenticity mediates the positive relationship between cultural heritage and the attractiveness of a destination.

The existential aspect of authenticity relates to tourists' emotions and perceptions, including spiritual uniqueness and a connection to history (Chhabra et al., 2003; Naoi, 2004; Kolar & Zabkar, 2010). A crucial component of perceived authenticity is the sense of enjoyment and emotional connection when visiting cultural heritage sites (Goulding, 2000). These emotional experiences make a destination more appealing to visitors. Tourists are drawn to destinations that offer meaningful and immersive experiences (Bryce et al., 2017). In cultural tourism, visitors desire to relive past lifestyles, even for a short moment (Chhabra et al., 2003). For example, tourists at Binh Phuoc's Ta Thiet Base may experience wartime conditions by crawling into bunkers and engaging in interactive historical activities, deepening their emotional connection to the past. According to Ramkison & Uysal (2010), authenticity strengthens tourists' perceptions and behaviors when consuming cultural attractions. Thus, existential authenticity enhances appreciation for cultural heritage and, in turn, increases destination attractiveness. Thus, the proposed hypothesis is:

Hypothesis 7 (H7): Existential authenticity mediates the positive relationship between cultural heritage and the attractiveness of a destination.

Based on the above hypotheses (H1 to H7), the conceptual framework of the study is illustrated in Figure 1. This model demonstrates the proposed relationships among cultural heritage, authenticity dimensions (object-based and existential), and destination attractiveness.

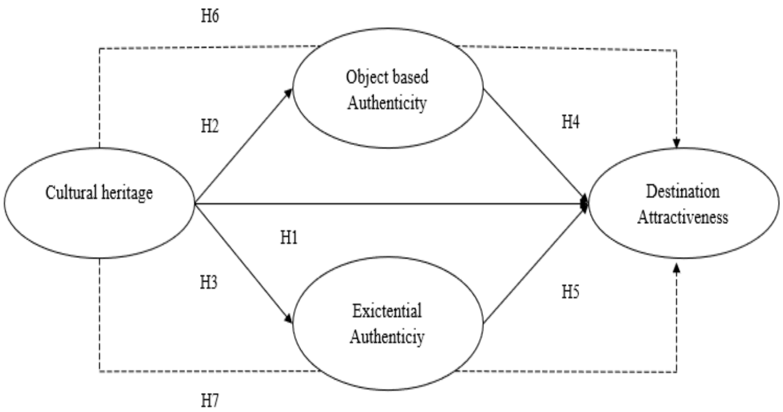

Figure 1. Conceptual Framework of the Study

METHODOLOGY

This research employs a survey based approach using a structured questionnaire across three main phases: 1/ Designing the initial measurement scale and conducting a preliminary survey: This phase involves drafting and refining the questionnaire to ensure clarity, reliability, and validity of the measurement items. 2/ Conducting the main study with actual tourists: The finalized questionnaire is distributed to tourists visiting cultural heritage sites in Binh Phuoc, 3/ Data processing and conclusion drawing. Data processing and conclusion drawing: The collected data is analyzed to derive meaningful insights and conclusions. The questionnaire is designed using a 5 point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to assess various aspects of authenticity and destination attractiveness. To investigate the relationship between cultural heritage, authenticity, and its impact on the attractiveness of Binh Phuoc as a tourist destination, this study employs direct survey methods. The target respondents are tourists who have visited major cultural heritage sites in Binh Phuoc, specifically: Ta Thiet Base Historic Site, The End Point of the Ho Chi Minh Trail (including the Ho Chi Minh Trail End Point Exhibition Area and the Diplomatic House). These sites were selected because they are designated as Special National Heritage Sites and attract a significant number of tourists. The data collection took place from March to April 2024. Following the research design of Adie & Hall (2017), the survey sites were chosen to ensure clear entry and exit points, allowing verification that respondents had actually visited the heritage sites before completing the questionnaire. Regarding the sampling method, Boomsma (1982) recommends a minimum sample size of 100 or 200 cases for Structural Equation Modeling (SEM) analysis, while Bentler & Chou (1987) suggest at least 5 to 10 cases per parameter. Given that the current study includes 19 measurement variables, the minimum required sample size is 190. To ensure sufficient valid responses, 230 questionnaires were distributed, and 222 valid responses were collected and used for analysis. Throughout the survey process, demographic factors were carefully considered to ensure the representativeness of the study sample.

RESULTS ANALYSIS

Measurement Model Assessment

To ensure the robustness of the measurement model, several statistical criteria were examined. As detailed in Table 1, all constructs demonstrated strong reliability, with outer loadings consistently above the 0.70 threshold. Similarly, Cronbach's Alpha (CA) and Composite Reliability (CR) values exceeded 0.70 for each scale, indicating satisfactory internal consistency. In addition, convergent validity was established through the Average Variance Extracted (AVE). Following Fornell & Larcker (1981), all AVE values surpassing 0.50 confirm that the observed indicators effectively represent their respective latent constructs. To assess discriminant validity, the Fornell-Larcker criterion was applied. Table 2 presents the inter-construct correlation matrix, where the square roots of AVE (diagonal values) are higher than the off-diagonal correlation coefficients.

This result supports adequate discriminant validity among the four key constructs: Cultural Heritage (HA), Object-Based Authenticity (AUTO), Existential Authenticity (AUTE), and Destination Attractiveness (DA). With the measurement model exhibiting acceptable reliability, convergent validity, and discriminant validity, the next step involves assessing the structural relationships among the constructs. To examine the structural validity of the proposed model, Structural Equation Modeling (SEM) was employed. This technique allowed for the assessment of both direct and indirect relationships among the latent constructs. As summarized in Table 3, all estimated direct paths are statistically significant ($p < 0.05$), providing empirical support for hypotheses H1 to H5. Specifically, Cultural Heritage (HA) exerts a strong positive influence on Destination Attractiveness (DA), both directly and indirectly through its impact on the two dimensions of authenticity.

Table 1. Reliability Assessment of Constructs

Variable Code	Constructs	Outer Loading	CA	CR	AVE
	Cultural Heritage (HA)		0.896	0.900	0.761
HA1	The heritage site is recognized as a cultural heritage	0.903	Source: Yu & Littrell (2003); Loan & Thanh (2014)		
HA2	Unique artistic architecture and handicrafts	0.868			
HA3	The heritage site has an engaging historical narrative, preserving numerous revolutionary relics	0.856			
HA4	The heritage site hosts numerous attractive events and activities	0.863			
	Object-Based Authenticity (AUTO)		0.890	0.897	0.602
AUTO1	Cultural heritage sites reflect the past across different historical periods of the locality	0.711	Source: Kolar & Zabkar (2010); Shi et al. (2018); Ha & Quyen (2021)		
AUTO2	Cultural heritage sites are well-preserved	0.780			
AUTO3	Artifacts and events of cultural heritage sites are authenticated by experts	0.798			
AUTO4	The overall architecture and historical imprints of cultural heritage sites create interest	0.785			
AUTO5	The restoration of cultural heritage structures remains true to the original (architecture, interior, artifacts, etc.)	0.799			
AUTO6	Souvenirs reflect the distinctive characteristics of cultural heritage sites	0.762			
AUTO7	Information about cultural heritage sites excites me	0.792			
	Existential Authenticity (AUTE)		0.837	0.869	0.665
AUTE1	Enjoy the peaceful atmosphere at cultural heritage sites	0.808	Source: Kolar & Zabkar (2010); Ha & Quyen (2021)		
AUTE2	Gain deeper insights into different historical periods of local heritage sites	0.775			
AUTE3	Feel connected to history, legends, and historical figures	0.851			
AUTE4	Feel immersed in the space of cultural heritage through participation in on-site activities	0.827			
	Destination Attractiveness of Binh Phuoc (DA)		0.907	0.908	0.782
DA1	Binh Phuoc is my top choice for travel	0.850	Source: Loan & Thanh (2014); Nghi (2019)		
DA2	Binh Phuoc attracts me more than any other destination	0.887			
DA3	I would like to spend more time exploring and experiencing this place	0.896			
DA4	Overall, Binh Phuoc is an attractive destination	0.903			

Table 2. Discriminant Validity - Fornell-Larcker Criterion

	AUTE	AUTO	DA	HA
AUTE	**0.816**			
AUTO	0.560	**0.776***		
DA	0.551	0.598	**0.885***	
HA	0.371	0.410	0.693	**0.873**

Table 3. Results of Direct Relationship Assessment

Hypothesis	Relationship	Impact Coefficient (ß)	P values	Conclusion
H1	HA → DA	0.693	0.000	Accepted
H2	HA → AUTE	0.371	0.000	
H3	HA → AUTO	0.410	0.000	
H4	AUTE → DA	0.211	0.000	
H5	AUTO →DA	0.274	0.000	

Results of SEM Model Analysis

P-Value Analysis: Fisher (1922) stated that most researchers use a significance threshold of 5% for the P-value to determine statistical significance. The analysis results indicate that the P-value for all relationships in the model is less than 0.05. This confirms that all proposed hypotheses are accepted with 95% confidence. Additionally, all impact coefficients are positive, indicating that the relationships in the model are positively correlated. Given that the P-value for all relationships remains below 0.05, it can be concluded that all factors exert a direct influence within the proposed research model.

Table 4. Results of Indirect Relationship Assessment

Hypothesis	Relationship	Impact Coefficient (ß)	P values	Conclusion
H6	HA → AUTE → DA	0.078	0.000	Accepted
H7	HA →AUTO →DA	0.112	0.000	

To further examine the mediating role of authenticity in heritage tourism, the study employed bootstrapping analysis to test two indirect pathways. As shown in Table 4, both indirect effects HA → AUTE → DA (H6) and HA → AUTO → DA (H7) were found to be statistically significant ($p < 0.001$), confirming that authenticity acts as a meaningful intermediary in the relationship between cultural heritage and destination attractiveness. These findings provide a more nuanced understanding of how the two dimensions of authenticity Object-Based (AUTO) and Existential (AUTE) interact to shape tourists' perceptions of destination attractiveness. The findings underscore the critical role of authenticity in enhancing the overall attractiveness of Binh Phuoc as a heritage tourism destination. Collectively, these results not only validate the theoretical assumptions of the model but also highlight the pivotal role of authenticity in translating cultural heritage into meaningful tourist experiences, an insight particularly relevant for emerging heritage destinations such as Binh Phuoc. Figure 2 provides a synthesized depiction of the validated model, highlighting the strength and direction of the structural relationships. This visual representation enhances comprehension and offers empirical clarity to the conceptual framework. These empirical insights lay a strong foundation for the subsequent discussion of theoretical and managerial implications, particularly in the context of heritage destination development.

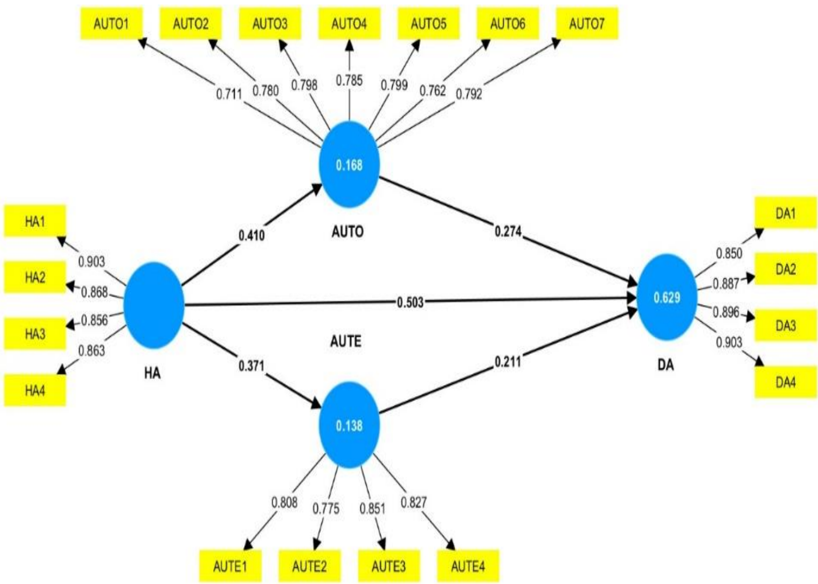

Figure 2. Theoretical Model of the Study

CONCLUSION AND IMPLICATIONS

Based on the results of the measurement model validation and SEM analysis, the hypothesis regarding the relationship between cultural heritage and authenticity, positively impacting the attractiveness of a destination, has been verified. This contributes to bridging the research gap in this field. Theoretically, the research findings reaffirm that cultural heritage is a key factor in attracting tourists to heritage tourism destinations (H1, $\beta = 0.693$, $p = 0.000$).

This aligns with the findings of Apostolakis (2003), who posited that the convergence of heritage and tourism activities signifies the emergence of heritage resources as attractions. This argument is further emphasized by Kolar and Zabkar (2010), highlighting that the cultural role of heritage attractions, along with their potential for knowledge enrichment and discovery of new sites, is crucial for cultural tourists. The hypothesis concerning the positive impact of cultural heritage on both existential authenticity and object-based authenticity has also been confirmed (H2, $\beta = 0.371$, $p = 0.000$; H3, $\beta = 0.410$, $p = 0.000$). Chhabra et al. (2003) demonstrated that heritage tourism knowledge influences perceived authenticity. Therefore, destination managers must package their products authentically to provide cultural value, educational insights, and historical narratives for tourists (Park et al., 2019; Sorrentino et al., 2020).

While there has been much debate regarding the commodification of heritage, the fundamental purpose of heritage commodification is not to destroy its authenticity but to reveal its exchange value (Kolar & Zabkar, 2010). In reality, cultural authenticity has been preserved and respected until recent years (Castéran & Roederer, 2013).

Tourists regard cultural heritage as an essential aspect of modern travel, seeking authentic experiences that are incomparable to other types of tourism (Mura, 2015). According to Song et al. (2017), authenticity is a critical factor in meaningful experiences, and the desire for authentic experiences is a key motivation for tourists, alongside nostalgia and social distinction (Lu et al., 2015; Leong, 2016). The arguments above, combined with the findings of this study, confirm the significant role of existential authenticity and object-based authenticity in positively influencing destination attractiveness (H4, $\beta = 0.211$, $p = 0.000$; H5, $\beta = 0.274$, $p = 0.000$).

The research also validates that object-based authenticity and existential authenticity serve as central mediators linking cultural heritage to tourism destination attractiveness (H6, $\beta = 0.078$, $p = 0.000$; H7, $\beta = 0.112$, $p = 0.000$).

This represents a novel finding compared to previous studies, as Kolar and Zabkar (2010) emphasized the mediating role of authenticity in shaping tourist loyalty. Overall, this research contributes to a better understanding of destination attractiveness by evaluating the impact of cultural heritage and, more specifically, the central role of existential and object-based authenticity within the context of Binh Phuoc, Vietnam.

Managerial Implications

To enhance Binh Phuoc's attractiveness to tourists, destination managers should focus on improving and strengthening elements such as cultural heritage, object-based authenticity, and existential authenticity. Destination managers of cultural heritage sites should pay attention to the overall architectural integrity, ensuring that restoration efforts remain true to the original structures. Souvenirs should reflect the unique characteristics of the heritage sites, and informational materials should be engaging and comprehensive. Tourists visiting heritage sites often seek immersive experiences related to the authentic cultural environment. Therefore, heritage tourism destinations should offer tourists authentic experiences that enhance their personal engagement. From this perspective, marketing managers should focus more on innovative storytelling techniques to enhance tourists' perception of existential authenticity.

Specifically, existential and object-based authenticity can be reinforced through architectural structures, historical events, and activities at sites such as Ta Thiet Base and the Ho Chi Minh Trail End (Reception House), allowing visitors to perceive them as authentic and historically significant. Currently, the original and reconstructed elements at Ta Thiet Base and the Ho Chi Minh Trail End are well organized. For instance, besides being introduced to the underground tunnels and trenches preserved in their original form by tour guides, visitors can participate in activities such as crawling through tunnels and exploring the underground shelters where revolutionary soldiers once worked at Ta Thiet Base. Similarly, at the Reception House, visitors can not only observe the reconstructed working and guest reception areas but also examine historical artifacts displayed in the museum, such as portraits of prominent leaders in the Vietnam People's Army, military equipment, and supplies used during the legendary Ho Chi Minh Trail operation.

These arrangements allow tourists to fully immerse themselves in the historical ambiance and authentically experience the historical phases of both heritage sites. Additionally, creating a tranquil and immersive atmosphere at heritage sites allows tourists to connect with historical narratives, legends, and historical figures, thereby fostering an authentic and memorable experience. Symbolic and reconstructed elements must be carefully curated to enable tourists to imagine and appreciate the heritage while maintaining a delicate balance between original objects and reproductions. This approach ensures that the historical integrity of the heritage sites is preserved. These efforts play a crucial role in positively shaping authenticity based tourism experiences. Beyond offering distinct experiential value, authenticity driven tourism also fosters tourists' awareness of sustainable heritage conservation. Moreover, these positive experiences contribute to generating favorable online reviews and word of mouth recommendations, encouraging friends and family members to visit the destinations. Positive word of mouth promotion serves as a crucial driver in attracting additional visitors, ultimately enhancing the competitiveness of heritage tourism destinations in the current market landscape.

Research limitations

Examining these relationships provides a deeper understanding of the interactions between these variables within the context of cultural heritage tourism, specifically in Binh Phuoc. This study adds value to the discourse by highlighting the central role of existential and object-based authenticity in shaping destination attractiveness. However, this study has several limitations. The data were collected using convenience sampling, which may limit the generalizability of the findings. Although the sample size (222 respondents) meets analytical requirements, it remains relatively small.

Future research should consider increasing the sample size to enhance representativeness and extend the study model by incorporating additional relevant concepts, such as intrapersonal authenticity and interpersonal authenticity, which may further influence the relationships examined in this study. This presents an avenue for future research development.

Author Contributions: Conceptualization, P.S.N. and N.Q.N.; methodology, P.S.N. and N.Q.N.; software, P.S.N. and Lien, T.T.N.; validation, P.S.N. and N.Q.N.; formal analysis, P.S.N. and Lien, T.T.N.; investigation, P.S.N. and N.Q.N.; data curation, P.S.N. and Lien, T.T.N.; writing - original draft preparation, P.S.N. and N.Q.N.; writing - review and editing, P.S.N. and N.Q.N.; visualization, P.S.N. and N.Q.N.; supervision, P.S.N. and N.Q.N.; project administration, P.S.N. and N.Q.N. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgements: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Adie, B. A., & Hall, C. M. (2017). Who visits World Heritage? A comparative analysis of three cultural sites. *Journal of Heritage Tourism, 12*(1), 67-80. https://doi.org/10.1080/1743873X.2016.1151429

Apostolakis, A. (2003). The convergence process in heritage tourism. *Annals of tourism research*, *30*(4), 795-812. https://doi.org/10.1016/S0160-7383(03)00057-4

Ariffin, A. A. M., & Mansour, J. S. (2018). The influences of authenticity and experience quality on behavioural intention in cultural heritage destination. *WSEAS Transactions on Business and Economics*, *15*(2108), 394-403.

Atasoy, F. (2021). Authenticity in Tourism. *Academic Turkish World Studies; Tourism, Culture, Art and Architeture*, Berlin, 377 – 398.

Bendix, R. (2009). *In search of authenticity: The formation of folklore studies*. Univ of Wisconsin Press.

Bentler, P. M., & Chou, C. P. (1987). Practical issues in structural modeling. *Sociological methods & research, 16*(1), 78-117. https://doi.org/10.1177/0049124187016001004

Boomsma, A. (1982). *The robustness of lisrel against small sample sizes in factor analysis models*. North-Holland Publ. Co.

Boorstin, D. (1961). *The image: A guide to pseudo-events in America*. New York: Harper and Row.

Boyd, S. (2002). Cultural and heritage tourism in Canada: Opportunities, principles and challenges. *Tourism and hospitality Research, 3*(3), 211-233. https://doi.org/10.1177/146735840200300303

Brown, L. (2013). Tourism: A Catalyst for Existential Authenticity. *Annals of Tourism Research* 40:176–90.

Bryce, D., Curran, R., O'Gorman, K., & Taheri, B. (2015). Visitors' engagement and authenticity: Japanese heritage consumption. *Tourism Management, 46*, 571-581. https://doi.org/10.1016/j.tourman.2014.08.012

Castéran, H., & Roederer, C. (2013). Does authenticity really affect behavior? The case of the Strasbourg Christmas Market. *Tourism Management, 36*, 153-163. https://doi.org/10.1016/j.tourman.2012.11.012

Caton K., & Santos, C. A. (2007). Heritage tourism on Route 66: Deconstructing nostalgia. *Journal of Travel Research, 45(4), 371-386.* https://doi.org/10.1177/0047287507299572

Cohen, E., & Cohen, S. A. (2012). Authentication: Hot and cool. *Annals of Tourism Research, 39*(3), 1295-1314. https://doi.org/10.1016/j.annals.2012.03.004

Coşkun, G. (2021). Authentic experience in tourism and commodification. *Journal of Tourism Leisure and Hospitality*, *3*(2), 95-102.

Cheng, M., Zhang, H., & Ye, B. H. (2023). Perceived authenticity and the heritage tourism experience: the case of Emperor Qinshihuang's Mausoleum Site Museum. *Asia Pacific Journal of Tourism Research,* 28(6), 503–520. https://doi.org/10.1080/10941665.2023.2245504

Chhabra, D. (2005). Defining authenticity and its determinants: Toward an authenticity flow model. *Journal of travel research, 44*(1), 64-73. https://doi.org/10.1177/0047287505276592

Chhabra, D., Healy, R., & Sills, E. (2003). Staged authenticity and heritage tourism. *Annals of tourism research, 30*(3), 702-719. https://doi.org/10.1016/S0160-7383(03)00044-6

Daniel, Y. P. (1996). Tourism dance performances authenticity and creativity. *Annals of tourism research, 23(4), 780-797.* https://doi.org/10.1016/0160-7383(96)00020-5

Domínguez-Quintero, A. M., González-Rodríguez, M. R., & Paddison, B. (2020). The mediating role of experience quality on authenticity and satisfaction in the context of cultural-heritage tourism. Current Issues in Tourism, 23(2), 248-260. http://dx.doi.org/10.1080/13683500.2018.1502261

Domínguez-Quintero, A. M., González-Rodríguez, M. R., & Roldán, J. L. (2021). The role of authenticity, experience quality, emotions, and satisfaction in a cultural heritage destination. *In Authenticity and Authentication of Heritage,* 103-117, Routledge. https://doi.org/10.1080/1743873X.2018.1554666

Fisher, R. A. (1922). On the interpretation of χ 2 from contingency tables, and the calculation of P. *Journal of the royal statistical society, 85*(1), 87-94. https://doi.org/10.2307/2340521

Formica, S. (2002). *Measuring destination attractiveness: A proposed framework. Journal of American Academy of Business, 1(2),* 350 – 355.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research, 18*(1), 39-50. https://doi.org/10.1177/002224378101800104

Fritz, M. S., & Lester, H. F. (2016). Mediator variables. In *Oxford Research Encyclopedia of Psychology*.

Frost, W. (2006). Braveheart-ed Ned Kelly: Historic films, heritage tourism and destination image. *Tourism Management, 27*(2), 247–254.

Geus, S.D., Richards, G. and Toepoel, V. (2015), Conceptualisation and operationalisation of event and festival experiences: creation of an event experience scale, *Scandinavian Journal of Hospitality and Tourism, Vol. 16* No. 3, pp. 274-296.

Goulding, C. (2000). The commodification of the past, postmodern pastiche, and the search for authentic experiences at contemporary heritage attractions. European Journal of Marketing, 34(7), 835–853.

Grayson, K., & Martinec, R. (2004). Consumer perceptions of iconicity and indexicality and their influence on assessments of authentic market offerings. *Journal of consumer research, 31(2), 296-312.* https://doi.org/10.1086/422109

Ha, T. T. T., & Quyen, L. T. H. (2021). Impacts of authenticity on tourists' experience quality and satisfaction – The case of Hue city. *Hue University Journal of Science: Economics and Development, 130* (5C), 85 – 105. https://doi.org/10.26459/hueunijed.v130i5C.6306

Hai, L.T. D., Nguyen, Q.N., & Huyen, K.N. (2023). The attraction of can tho city, Vietnam as a tourist destination. *GeoJournal of Tourism and Geosites,* 50(4), 1458–1465. https://doi.org/10.30892/gtg.50426-1144

Halewood, C., & Hannam, K. (2001). Viking heritage tourism: Authenticity and commodification. Annals of tourism research, 28(3), 565-580.

Handler, R. (1986). Authenticity. *Anthropology today, 2*(1), 2-4. https://doi.org/10.2307/3032899

Iqbal, M., Kusumawati, A., & Fahmi, M. R. A. (2023). The role of authenticity on revisit intention: tourist experience as a mediation at the Reyog Ponorogo National Festival. *International journal of event and festival management, 14(*3), 344-362. https://doi.org/10.1108/IJEFM-09-2022-0069

Jang, S. S., Ha, J., & Park, K. (2012). Effects of ethnic authenticity: Investigating Korean restaurant customers in the US. International Journal of Hospitality Management, 31(3), 990-1003. https://doi.org/10.1016/j.ijhm.2011.12.003

Kim, H., & Jamal, T. (2007). Touristic quest for existential authenticity. *Annals of tourism research, 34*(1), 181-201. https://doi.org/10.1016/j.annals.2006.07.009

Kim, S., & Littrell, M. A. (1999). Predicting souvenir purchase intentions. *Journal of Travel Research, 38*(2), 153-162. https://doi.org/10.1177/004728759903800208

Kolar, T., & Zabkar, V. (2010). A consumer-based model of authenticity: An oxymoron or the foundation of cultural heritage marketing?. *Tourism management, 31*(5), 652-664. https://doi.org/10.1016/j.tourman.2009.07.010

Krešić, D., & Prebežac, D. (2011). Index of destination attractiveness as a tool for destination attractiveness assessment. *Tourism: An International Interdisciplinary Journal, 59*(4), 497-517. https://hrcak.srce.hr/75744

Lee, J. S., Lee, C. K., & Choi, Y. (2011). Examining the role of emotional and functional values in festival evaluation. *Journal of Travel Research, 50*(6), 685-696.

Leigh, T. W., Peters, C., & Shelton, J. (2006). The consumer quest for authenticity: The multiplicity of meanings within the MG subculture of consumption. *Journal of the academy of Marketing science, 34*(4), 481-493. https://doi.org/10.1177/0092070306288403

Loan, Đ. T. T., & Thanh, B. T. (2014). Các yếu tố ảnh hưởng đến thu hút khách du lịch: Nghiên cứu trường hợp điểm đến du lịch Bình Định [Factors affecting tourist attraction: A case study of Binh Dinh tourist destination]. Tạp chí Kinh tế & Phát triển, 210(2), 36-44 (in Vietnamese). https://dlib.neu.edu.vn/handle/NEU/36097

Lu, L., Chi, C. G., & Liu, Y. (2015). Authenticity, involvement, and image: Evaluating tourist experiences at historic districts. *Tourism management, 50, 85-96.* https://doi.org/10.1016/j.tourman.2015.01.026

MacCannell, D. (1973). Staged authenticity: Arrangements of social space in tourist settings. *American journal of Sociology, 79(*3), 589-603. http://www.jstor.org/stable/2776259

Mayo, E. J., & Jarvis, L. P. (1981). *The psychology of leisure travel. Effective marketing and selling of travel services.* C.B.I. Publishing Co, 281 p.

McIntosh, A. J., & Prentice, R. C. (1999). Affirming authenticity: Consuming cultural heritage. *Annals of tourism research, 26*(3), 589-612. https://doi.org/10.1016/S0160-7383(99)00010-9

McKercher, B. (2002). Towards a classification of cultural tourists. *International Journal of Tourism Research*, 4(1), 29–38.

Mura, P. (2015). Perceptions of authenticity in a Malaysian homestay–A narrative analysis. *Tourism Management, 51*, 225-233. https://doi.org/10.1016/j.tourman.2015.05.023

Naoi, T. (2004). Visitors' evaluation of a historical district: The roles of authenticity and manipulation. Tourism and Hospitality Research, 5(1), 45-63. https://doi.org/10.1057/palgrave.thr.6040004

Neumann, M. (1992). The traveling eye photography, tourism and ethnography. *Visual Studies,* 7(2), 22-38. https://doi.org/10.1080/14725869208583701

Nuryanti, W. (1996). Heritage and postmodern tourism. *Annals of Tourism Research*, 23 (2), 249-260.

Nyaupane, G. P., & Budruk, M. (2009). South Asian heritage tourism: conflict, colonialism, and cooperation. *In Cultural Heritage and Tourism in the Developing World (pp. 141-159).* Routledge. https://www.taylorfrancis.com/chapters/edit/10.4324/9780203877753-18/south-asian-heritage-tourism-con%EF%AC%82ict-colonialism-cooperation-gyan-nyaupane-megha-budruk

Nghi, N. Q. (2019). Factors affecting the attractiveness of rural tourism in Phong Dien District, Can Tho City. *Dong Nai University Journal of Science*, *14,* 29-38.

Olsen, K. (2002). Authenticity as a Concept in Tourism Research: The Social Organization of the Experience of Authenticity. *Tourist Studies* 2 (2): 159–82.

Palmer, J. A. (1999). *Plato's reception of Parmenides*. Clarendon Press.

Park, E., Choi, B. K., & Lee, T. J. (2019). The role and dimensions of authenticity in heritage tourism. *Tourism Management*, *74*, 99-109.

Poria, Y., Reichel, A., & Biran, A. (2006). Heritage site management: Motivations and expectations. *Annals of tourism research, 33*(1), 162-178. https://doi.org/10.1016/j.annals.2005.08.001

Ram, Y., Björk, P., & Weidenfeld, A. (2016). Authenticity and place attachment of major visitor attractions. *Tourism management, 52*, 110-122. https://doi.org/10.1016/j.tourman.2015.06.010

Ramkissoon, H., & Uysal, M. (2010). Testing the role of authenticity in cultural tourism consumption: A case of Mauritius. *Tourism Analysis*, *15*(5), 571-583.

Reisinger, Y., & Steiner, C. J. (2006). Reconceptualizing object authenticity. *Annals of tourism research, 33*(1), 65-86. https://doi.org/10.1016/j.annals.2005.04.003

Sharpley, R. (1994). *Tourism, tourists and the society*. Huntingdon: ELM.

Shepherd, R. (2002). Commodification, culture and tourism. *Tourist studies, 2*(2), 183-201. https://doi.org/10.1177/146879702761936653

Song, H. M., Kim, K. S., & Yim, B. H. (2017). The mediating effect of place attachment on the relationship between golf tourism destination image and revisit intention. *Asia Pacific Journal of Tourism Research*, *22*(11), 1182-1193.

Sorrentino, A., Fu, X., Romano, R., Quintano, M., & Risitano, M. (2020). Measuring event experience and its behavioral consequences in the context of a sports mega-event. *Journal of Hospitality and Tourism Insights*, *3*(5), 589-605.

Supriono, & Yulianto, E. (2021). The Effect of Festival Quality on Revisit Intention: Mediating Role of Destination Image in Jember Fashion Carnaval, Jember, Indonesia. *GeoJournal of Tourism and Geosites*, 38(4), 1195–1202. https://doi.org/10.30892/gtg.38426-760

Supriono, Iqbal, M., Kusumawati, A., & Fahmi, M. R. A. (2023). The role of authenticity on revisit intention: Tourist experience as a mediation at the Reyog Ponorogo National Festival. *International Journal of Event and Festival Management, 14*(3), 344–362. https://doi.org/10.1108/IJEFM-09-2022-0069.

Uslu, F., Yayla, O., Guven, Y., Ergun, G. S., Demir, E., Erol, S., & Gozen, E. (2023). The perception of cultural authenticity, destination attachment, and support for cultural heritage tourism development by local people: The moderator role of cultural sustainability. *Sustainability*, *15*(22), 15794. https://doi.org/10.3390/su152215794

Vengesayi, S. (2003). Destination attractiveness and destination competitiveness: A model of destination evaluation. *In ANZMAC 2003 Conference Proceedings Adelaide,* 637-645.

Wang, N. (2000). *Tourism and modernity: A sociological analysis.* Kidlington, Oxford: Elsevier Science

Wang, N. (1999). Rethinking authenticity in tourism experience. *Annals of Tourism Research*, *26*(2), 349–370. https://doi.org/10.1016/S0160-7383(98)00103-0

Yi, X., Fu, X., Lin, V. S., & Xiao, H. (2022). Integrating authenticity, well-being, and memorability in heritage tourism: A two-site investigation. *Journal of Travel Research, 61*(2), 378-393. https://doi.org/10.1177/0047287520987624

Yi, X., Fu, X., So, K. K. F., & Zheng, C. (2023). Perceived authenticity and place attachment: new findings from Chinese world heritage sites. *Journal of Hospitality & Tourism Research, 47*(5), 800-826. https://doi.org/10.1177/10963480211027629

Yi, X., Lin, V. S., Jin, W., & Luo, Q. (2017). The authenticity of heritage sites, tourists' quest for existential authenticity, and destination loyalty. *Journal of Travel Research, 56*(8), 1032-1048. https://doi.org/10.1177/0047287516675061

Zou, Y., Lan, T., Liu, S., & Zeng, H. (2024). The Post-Effects of the Authenticity of Rural Intangible Cultural Heritage and Tourists' Engagement**.** *Behavioral Sciences,* 14(4), 302. https://doi.org/10.3390/bs14040302

Article history: Received: 14.03.2025 Revised: 02.06.2025 Accepted: 25.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1372-1379
DOI 10.30892/gtg.602spl32-1508

NAVIGATING THE THRESHOLD: INVESTIGATING LIMINALITY AND THE TRANSITIONAL STATES OF VOLUNTEER TOURISTS

NgeyanNega ALMUTAIRI [1], Bechir FRIDHI [1*]

[1] Majmaah University, Department of Financial Management, College of Business Administration, Al-Majma'ah, Saudi Arabia, n.alsadoni@mu.edu.sa (N.N.A.); Bm.fridhi@mu.edu.sa (B.F.)

Citation: Almutairi, N.N., & Fridhi, B. (2025). Navigating the threshold: Investigating liminality and the transitional states of volunteer tourists.*Geojournal of Tourism and Geosites*, 60(2spl), 1372–1379. https://doi.org/10.30892/gtg.602spl32-1508

Abstract: Volunteer tourism has emerged as a compelling form of alternative travel, where individuals engage in unpaid work abroad while seeking personal enrichment and cross-cultural exchange. Unlike conventional tourism, volunteer tourism situates participants in a space of ambiguity neither fully tourists nor integrated locals. This liminal condition fosters complex emotional and psychological responses, as individuals navigate unfamiliar cultural environments, uncertain roles, and shifting expectations. This study investigates how international volunteer tourists construct transitional identities through these experiences and how such identity negotiations shape the overall journey. Using a phenomenological methodology, we conducted 150 semi-structured interviews with volunteers active in diverse regions including Africa, Asia, and Latin America. Participants reported persistent feelings of cultural displacement, emotional discomfort, and marginalization. Many encountered symbolic 'monsters' representing internal conflict, ethical uncertainty, and role confusion—that challenged their sense of self and purpose. The findings reveal that liminality often becomes a prolonged, cyclical state rather than a temporary phase, leaving many volunteers suspended in a space of perpetual transformation. While some experienced moments of deep self-discovery and growth, others described feelings of futility and detachment. The degree of social integration, adaptability, and reflective engagement played a key role in determining whether the experience was transformative or merely disorienting. Structured programs, while offering security, sometimes limited genuine intercultural contact and diluted the transformative potential. This paper argues that volunteer tourism should not be idealized as inherently empowering; rather, it is a nuanced and fragile process shaped by context, agency, and intercultural dynamics. Understanding these transitional identity processes contributes to a more critical and realistic perspective on the complexities of volunteer tourism.

Keywords: volunteer tourism, liminality, transitionalidentity, cross-cultural exchange, self-discovery, social integration, transformative experience

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INTRODUCTION

Tourist experiences are inherently complex and difficult to predict, as they are shaped by individual expectations, situational factors, and the nature of the encounter itself. Within the domain of volunteer tourism, this complexity is further amplified by the liminal nature of the experience, wherein volunteers navigate an ambiguous space between being tourists and temporary community members (Martin & Lopez, 2025). The literature has extensively explored the transformative potential of volunteer tourism, often portraying it as a journey of personal growth that pushes individuals outside their comfort zones (Almeida & Petrova, 2025).

However, scholars have also questioned the depth and sustainability of this transformation, highlighting its variability and, at times, its superficiality (Nguyen & Santos, 2025). Despite these discussions, there remains a gap in understanding the nuanced process through which volunteer tourists experience and negotiate liminality, particularly in terms of whether this state leads to meaningful change or an unresolved limbo (Rodriguez & Wang, 2025).

Building on perspective of volunteer tourism as a continuously (re)invented and (re)produced phenomenon, this study investigates how liminality operates within structured volunteer programs. As volunteers transition between roles and responsibilities, the liminal experience can become routinized, resembling a structured and repetitive work environment rather than an unpredictable journey of transformation. Furthermore, volunteer tourists are often dependent on intermediaries—such as program coordinators, local staff, and fellow volunteers—who shape their experience and influence their perceived impact. This institutionalization of volunteer tourism reflects an industry-driven need to standardize experiences through safety measures, quality control, and structured programming. However, even within these controlled environments, volunteers may encounter moments of unpredictability that challenge their preconceived expectations Amaro (2023).

Liminality, by definition, is a transitional state of being "betwixt and between," where individuals move through phases of transformation under the influence of external factors. Yet, for some volunteer tourists, this liminal stage does not necessarily lead to a definitive transformation. Instead, they may find themselves in a state of prolonged uncertainty, where their expectations of making a meaningful impact clash with the realities of their limited agency

* Corresponding author

within host communities. This study aims to unravel the complexities of this phenomenon by examining how volunteer tourists navigate their liminal experiences, the challenges they face, and the extent to which they transition beyond this liminality or become trapped in a state of limbo Kadomskaia et al. (2023).

Theory

This study aims to investigate the nuanced experiences of liminality and transformation among international volunteer tourists. Specifically, it explores how these individuals construct and navigate transitional identities within culturally unfamiliar environments and assesses the extent to which their engagement leads to enduring personal transformation or results in a state of prolonged limbo. The research highlights the dual nature of volunteer tourism as both a site of potential growth and an arena where volunteers may experience unresolved identity struggles (Norton, 2016).

The concepts of transformation and transition are central to understanding the experiential landscape of volunteer tourism (Nguyen & Santos, 2025). Transition, as articulated and refers to a temporal and adaptive passage from one state to another and is often characterized by subtle psychological shifts. In contrast, transformation, rooted in a theory of transformative learning, implies a radical reconfiguration of one’s worldview, involving deep shifts in identity, values, and beliefs. This dichotomy is vital when evaluating volunteer tourism, a field often portrayed through narratives of personal development, altruism, and cross-cultural engagement. Turner (1969) provides a sociological counterpart with his theory of liminality, positioning individuals in a 'betwixt and between' state during rites of passage. Yet, as (Rodriguez & Wang, 2025) have pointed out, contemporary experiences such as volunteer tourism can result in prolonged or even permanent liminality, where transformation is frozen, and incorporation never occurs (Singh & Torres, 2025).

Recent scholarship confirms that while volunteer tourism may offer the conditions for personal change, it more frequently results in ambivalent or stalled transitions, many researchers critique the oversanitized structure of volunteer programs, which constrain authentic experiences and diminish the potential for transformation. emphasizes the recurring sense of disempowerment and existential doubt among volunteers, challenging the dominant celebratory discourse. More recently, researchers propose a re-evaluation of volunteer tourism as a state of 'liminal stasis,' where repetitive challenges prevent narrative closure or identity reintegration. This is consistent with studies who identify critical gaps in post-experience incorporation, noting that many volunteers return home with unresolved questions, diminished enthusiasm, or feelings of futility researchers introduced the concept of a liminality continuum, which has been further refined to include the idea of liminoid loops, cyclical returns to transitional states without lasting change (Foster & McCabe, 2015).

The persistent presence of 'symbolic monsters' metaphors for internalized fears, cultural dissonance, or ethical dilemmas further complicates the transformative potential of volunteer tourism. This archetypal framework, borrowed from researchers, positions volunteers as modern-day 'heroes' caught in a loop of unresolved quests. These figures are not just narrative devices but represent real psychological obstacles: culture shock, role ambiguity, ethical concerns, and gendered vulnerabilities. The dataset from this study illustrates these challenges vividly, with participants reporting marginalization, operational mismatches, emotional exhaustion, and unfulfilled expectations. Female participants, in particular, encountered intensified vulnerability due to gender norms and safety concerns in patriarchal contexts, corroborating findings.

The critical review of findings reveals that liminality is less a transitional state than a cyclical condition volunteers move between excitement, doubt, marginalization, and fleeting empowerment without reaching a point of reintegration. This cycle, conceptualized in this research as "perpetual liminality," metaphor of a film stopped mid-frame. Theoretical contributions such as those researchers, support the idea that transformation, when it occurs, is conditional on critical reflection, structural support, and sustained intercultural dialogue elements often absent in volunteer tourism programs. Despite intentions of cultural exchange, the asymmetry of power, lack of local agency, and commercialization of altruism result in experiences where volunteers' growth is sporadic and shallow (Magrizos et al., 2021).

The limitations of existing studies and this research must be acknowledged. Much of the current literature relies on self-reported data, which can be biased by social desirability or romanticized memory. Furthermore, host communities' perspectives remain underrepresented, narrowing the analysis to a volunteer-centric lens. Another limitation is the lack of longitudinal data; without follow-up, it is impossible to assess whether identity transformations endure or dissolve upon return. This research mitigates some of these gaps through robust thematic analysis and validation methods (e.g., member checks, inter-coder reliability), yet it still calls for more inclusive and temporally extended studies.

METHOD

To investigate the transitional states and liminality experienced by volunteer tourists, this study adopts **Phenomenological Analysis** with a focus on narrative data collected through in-depth interviews and reflective accounts from participants. Phenomenology allows us to explore how volunteer tourists perceive and navigate their liminal experiences, as they engage in various volunteer tourism projects (Martin & Lopez, 2025). The method is particularly suited to understanding how participants construct meaning from their transformative experiences, shedding light on how these periods of transition influence their identity and sense of belonging (Torres & Kim, 2025).

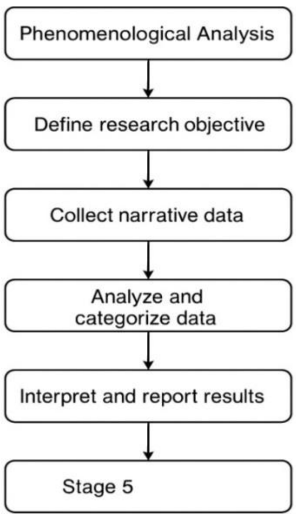
The study follows a five-stage approach: 1. Defining the research objective and identifying the focus on the volunteer tourist experience; 2. Recruiting participants with varied demographics and volunteer experiences; 3. Collecting narrative data through semi-structured interviews; 4. Analyzing and categorizing the data; and 5. Interpreting and reporting the results. In stage 1, the research team defined the aim to explore how liminal states emerge during volunteer tourism, focusing on how individuals experience the transition between their home culture and the volunteer destination. The second stage involved identifying and recruiting participants who had volunteered in international projects in Africa, Asia, and Latin America within the past two years.

Stage 3 focused on collecting data through semi-structured interviews with 150 volunteer tourists. The interviews were conducted over a six-month period, from January to June 2024, and were designed to gather comprehensive reflections on their experiences. Participants were asked to share their expectations before the trip, challenges faced during their volunteering, and how they made sense of their involvement in the host community. Interviews lasted between 40 minutes and 1.5 hours and were audio-recorded and transcribed verbatim. Of the 150 participants, 68% were female (n = 102), 31% were male (n = 46), and 1% identified as non-binary (n = 2). The majority of participants were from Europe (41%), followed by North America (28%), and Australia and New Zealand (18%). The remaining 13% came from various regions, including Asia and South America. In stage 4, the transcribed interviews were analyzed using a thematic approach, as outlined by researchers. The data was systematically coded to identify recurring themes related to the volunteer tourists' experiences of liminality. Initial codes included themes such as "cultural displacement," "role ambiguity," "expectation vs. reality," and "identity transformation." These codes were refined through multiple stages of analysis, with the help of the research team, to ensure accuracy and depth. NVivo software was used to organize and manage the data, allowing for efficient theme identification and categorization.

A critical part of the analysis was to examine the reflective narratives from the participants, which were categorized into **critical incidents**. For example, 23% of participants described experiencing a "culture shock" during their stay, where the difference in social norms and values led to a significant adjustment in their perspectives. Another 17% noted moments of "identity confusion," where their role as a volunteer created tensions with their self-perception. These incidents were significant in understanding the liminal states, as they disrupted the participants' expectations and forced them to confront new identities and roles. To ensure validity and reliability, we conducted member checks by sending summary findings back to a random sample of 30 participants for feedback.

The feedback was positive, with 90% of respondents agreeing that the themes captured in the study accurately reflected their experiences. Additionally, intercoder reliability was tested by having two researchers independently code 20% of the data, yielding a Cohen's Kappa score of 0.87, which, following recent guidelines by Torres & Kim (2025), is interpreted as indicating "almost perfect" agreement. This robust approach allowed for a comprehensive and nuanced understanding of the volunteer tourist experience and the complex transitions they undergo.

To visually summarize the research procedure, Figure 1 presents a flowchart outlining the five main stages of the phenomenological methodology adopted in this study. This schematic representation offers a clear overview of how the research was conceptualized, structured, and conducted from defining objectives to reporting results. It provides an accessible guide for readers to understand the sequential and iterative nature of the methodological process used to explore volunteer tourists' experiences of liminality and transition Van Manen (1990).



Phenomenological analysis

Figure 1. Flowchart outlining the five main stages of the phenomenological methodology adopted in this study

The results of the analysis provide insights into the continuous liminal states that volunteer tourists experience, revealing the significant role of these transitional moments in shaping their identities and understanding of the volunteer tourism process. By examining the data through a phenomenological lens, this study offers a deeper comprehension of how volunteer tourists navigate their shifting roles, expectations, and cultural integration during their time abroad.

FINDINGS

The Challenges of VolunteerTourists' Liminal State

Five key themes or challenges of the volunteer tourists' liminal state are identified: adjusting to new living conditions, negotiating cultural differences, facing operational disparities, a continuous feeling of marginalisation and vulnerability, and confronting the 'monster' of doubt regarding their impact. These challenges are examined through quotes from critical incidents, followed by a discussion in relation to existing literature.

Locked in the Liminal Space: Living Conditions

All participants, to varying degrees, experienced difficulties adjusting to the living conditions in their host countries, some more readily than others. While some volunteers found the challenges presented by the liminal space educational, others felt trapped in a cycle of daily hardship.

“My host familydidn’t have electricity or water 50% of the time. It waschallenging to getused to the lack of conveniences, but itwasa good learningexperience.” (Female, 28, Canadian volunteering in Africa, 2 weeks)

“you do not have electricity or eatwhatyou’reused to at home, whichisn’tsobad. But people living in poverty and ignorance at the hospital, where the word ‘empathy’ is not evenknown... you cannot change a country’s culture, lifestyle, or mindset.”(Female, 24, Dutch volunteering in Africa, 6 weeks).

Adjusting to new living conditions, such as sharing cramped spaces and constantly being treated as though one were rich or as a target for exploitation, added to the sense of being in a liminal space.

Culture

Within this liminal space, volunteers found themselves navigating multiple national and microcultures. This constant process of adjustment was a key factor contributing to the sense of perpetual liminality.

“Gettingused to Jamaican culture waschallenging, especiallydealingwith the advances of strangers on the streets. It took me almost a month to feelsafewalkingthrough the town to my placement.” (Female, 22, American volunteering in Jamaica, 12 weeks)

“I founditdifficult to adjust to the factthat, probablybecause I amfemale, everyone (evencasualacquaintances) hadsomething to say about myphysicalappearance.” (Female, 26, American volunteering in Moldova, 4 weeks)

The constant need to adapt added a layer of tension, as volunteers continuously navigated unfamiliar cultural norms, which deepened the liminality of the experience.

Operational Differences

In the context of volunteer tourism, critical incidents are moments that highlight conflicts between personal expectations and the realities of the local environment. Volunteers encountered such incidents, which brought their roles and the host culture into stark contrast with their Western norms.

“Delivering a baby—two babies, actually! This experience was the most enjoyable and memorable one!”(Female, 21, American volunteering in Africa, 4 weeks)

“Being held up by a gunman was by far the most challenging thing I had to contend with. It left me without money, my handbag, my phone, and shattered my spirit.” (Female, 40, Australian volunteering in South America, 12 weeks)

Such incidents can often serve as catalysts for critical reflection on the operational differences between volunteer tourists’ expectations and local realities.

Feeling Marginalised and Vulnerable in the Liminal State

The volunteers' experiences were marked by a strong sense of marginalisation due to their foreignness and perceived difference in the host environment. This feeling was often exacerbated by gender-related challenges, particularly for female volunteers, who reported feeling vulnerable to unwanted attention or harassment.

“Being a woman of a different and rare ethnicity in [host city] was a little challenging. I was stared at a lot and often approached by strange men. People would ask to take pictures of me, often without permission.”(Female, 21, American volunteering in South America, 9 weeks). Additionally, some volunteers found themselves in unsafe situations, where their vulnerability was heightened by a lack of support.

“I tried to message people saying how unsafe I felt, but I was told that it was even more dangerous to get off the vehicle, so I needed to stay on.”(Female, 31, American volunteering in Ghana, 2 weeks). In some cases, this sense of marginalisation extended to the volunteers’ accommodation or homestay, where they were not made to feel welcome.

“Our host mother rarely communicated with us, and we were woken up each morning by arguments. We did not feel welcome, as though we were intruding in their home.”(Female, 21, British volunteering in Fiji, 3 weeks). In more severe cases, volunteers had to cope with inappropriate behavior from hosts, ranging from uncomfortable questions to sexual advances. Being completely dependent on a host who was more interested in making sexual advances than ensuring my safety was the most challenging and disappointing aspect of this trip.” (Female, 20, American volunteering in Romania, 3 weeks)

Facing the ‘Monster of Doubt’

Volunteer tourists often faced a period of initial doubt regarding their abilities and their decision to volunteer. This self-doubt usually faded after some time, but a more significant doubt began to emerge regarding the impact of their contributions and the ethics of volunteer tourism itself.

“The first few dayswerequitechallenging. I questionedwhether I had made the right decision. I felthomesick, but aftera few days, I started to feelbetter. By the end, I wanted to stay longer, but myfamilywanted me to return.” (Female, 18, Irish volunteering in Ethiopia, 2 weeks)

"When I first arrived and didmy first day at the school, I criedbecause I thought 'I can't do this!' I didn'tthink I hadanything to offer."(Female, 24, British volunteering in South Africa, 4 weeks)

Over time, many volunteers grew more confident, but doubts surrounding the utility of their work and its real impact resurfaced.

"The biggest challenge for me was the feeling of futility. There wasn't much for me to do, and I had to find my own place within the project. It felt as if my efforts weren't making any difference." (Male, 18, Dutch volunteering in the Pacific, 4 weeks)

Moreover, a sense of disillusionment arose for some volunteers upon realising that the funds they had invested in their volunteer experience were not being used effectively in the local context.

"It was disheartening to learn that the money I spent barely went to my program or host family." (Female, 24, Canadian volunteering in South America, 8 weeks)

This feeling of futility was compounded by a lack of structure, unclear work expectations, and too much support from the sending organization, leaving volunteers frustrated and questioning their roles.

"Lack of work, no guidance, and hours of idle time were very disheartening. I had no clear direction or accountability." (Female, 44, Australian volunteering in Fiji, 4 weeks)

Some volunteers expressed frustration at the lack of autonomy, which led to a deeper questioning of the value of their participation in volunteer tourism and the ethical implications surrounding it.

"I would honestly have asked for less support. Sometimes it was overwhelming, and it felt more like hand-holding than genuine help." (Male, 27, American volunteering in Asia, 4 weeks)

Despite these frustrations, a few volunteers concluded that the experience, although challenging, had been transformative, leading them to more informed perspectives on themselves and the world.

"The challenges we face are each constructive blessings. They strengthen our character and lead us to renewed, more-informed perspectives." (Male, 20, American volunteering in South Africa, 8 weeks)

DISCUSSION

As illustrated in (Figure 2 and 3), the unpredictability and liquidity of the volunteer tourist experience place volunteers in in-between or liminal positions. This liminality is captured by the five key themes of the findings: 'Locked' in the liminal space (1); culture (2); operational differences (3); feeling continuously marginalised and vulnerable (4); and facing the monster of doubt (5). The findings have shown that the volunteers were not just facing a challenge that was then overcome. Instead, in many cases, they faced the same challenge, continuously trapped by the liminality of the space. It is heuristically useful not only to view liminality as transitional but as perpetual researchers, a limbo state that pertains to the more lasting experience of novelty, uncertainty, vulnerability, ambiguity, and doubt.

We do not discount that there might be fleeting moments of transformation, but we also argue that transformation can be frozen or stalled (Figure 1 and 2).

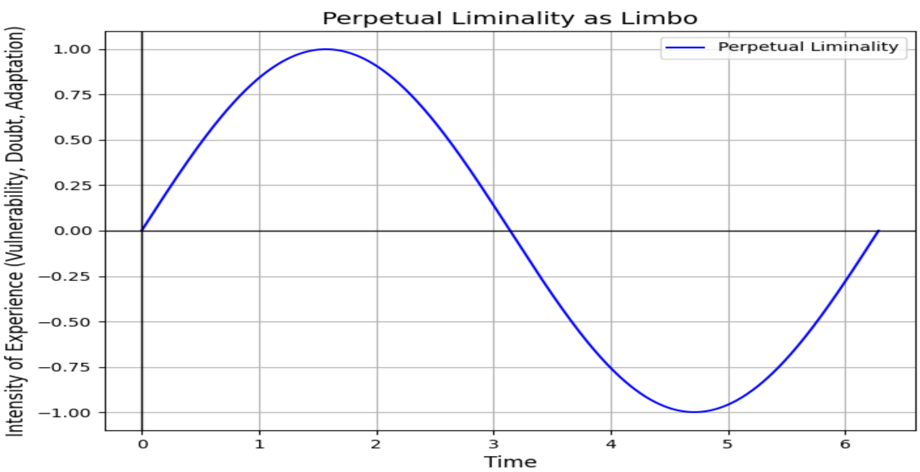


Figure 2. Perpetual liminality as limbo (Source: Authors' fieldwork analysis, 2024) (Note: The horizontal axis represents the progression of time throughout the volunteer experience, while the vertical axis reflects the intensity of perceived liminality)

Figure 2 illustrates the evolving intensity of perceived liminality experienced by volunteer tourists throughout their journey. The horizontal axis represents the chronological phases of the volunteer experience (Arrival, Cultural Immersion, Crisis, Reflection, Re-entry), while the vertical axis shows the intensity of psychological and emotional liminality. The curve suggests that liminality is not a linear or temporary phenomenon but occurs in repeated waves, influenced by cultural shock, role ambiguity, ethical doubt, and emotional adaptation. Each phase brings new challenges (symbolic "monsters"), requiring the volunteer to renegotiate their identity. This cyclical pattern supports the concept of *perpetual liminality* rather than a single transformative event.

This figure can represent the cyclical nature of liminality, where volunteers experience repeated phases of vulnerability, doubt, and adaptation. According to the literature on liminality, the liminal space presents individuals with challenging encounters, with 'symbolic monsters' that must be tamed, mastered, and overcome as part of crossing a threshold. The volunteers in this study found themselves in numerous situations that may represent the archetypal monsters presiding over the passages of volunteer tourists. However, in the mythology of the heroic journey, the hero does not fight the same 'monster' every day. The constant negotiating and renegotiating of the same problems and challenges make each volunteer tourist day almost *Groundhog Day*.

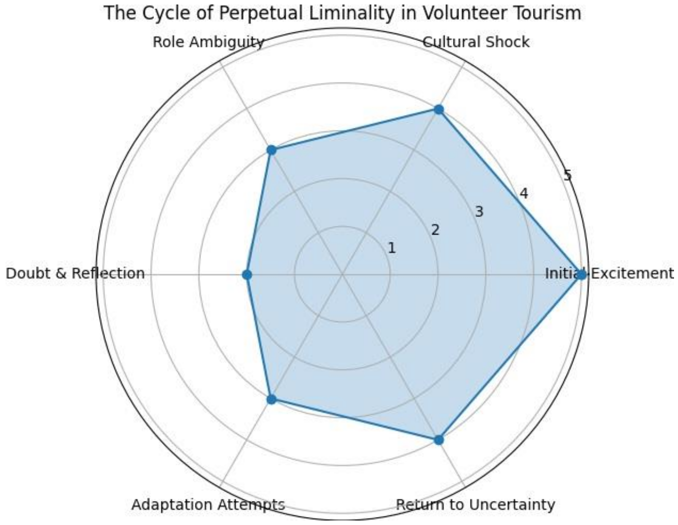


Figure 3. The Symbolic 'Monsters' in Volunteer Tourism (Source: Authors' fieldwork analysis, 2024)

Figure 3 visualizes the symbolic challenges (or "monsters") encountered by volunteer tourists throughout different phases of their journey. These metaphorical monsters—such as cultural shock, role ambiguity, ethical dilemmas, and personal doubt—represent the emotional and psychological barriers that hinder transformation and reinforce the feeling of being trapped in a liminal state. The horizontal axis maps key phases of the volunteer experience (e.g., Arrival, Immersion, Disillusionment, Reflection), while the vertical axis indicates the **intensity** of each challenge. The size and recurrence of each "monster" symbolize how these emotional obstacles vary by individual, situation, and context.

Rather than facing new challenges at each stage, volunteers often confront the **same symbolic threats repeatedly**, reflecting the cyclical and unresolved nature of their liminal experience. Not all the 'monsters' are the same, but the size of the 'monster' canbe relative to the unique individual characteristics of the volunteers and each situation, as reflected by critical incidents. The incidents shared by volunteersdemonstrate how the reality on the groundwaschallenging and relentless, affectingtheirexperience, constantlypushing the participants into a limbo state whereseeminglynothingever changes. Uponarrival, volunteers must acclimatize and adjust to their accommodation and living conditions, including a lack of electricity, Wi-Fi, differenthygiene practices, or even the rules and dictates of the host family, includingcurfews, shower times, and instances where the volunteersfeltlikehostages. To some, thesemonsterswillbe large, intimidating, and impedetheirjourney, while to others, theywillbeperceived as more trivial. Differences in priorities and perspectives related to culture also influenced the size of the 'monster,' as volunteers continuously had to attempt to fit into the locals' day-to-day activities (Coghlan & Weiler, 2018). This continuous sense of feeling out of place, conspicuous, and threatened was highlighted by the participants. Volunteers had to get used to the noise, crowds, and unwanted attention from locals, including street hawkers and the advances of local men. Some volunteers dismissed this as mere cultural curiosity, while others felt threatened by a larger 'monster.' What made this more intense was the realisation that they would probably have to face the same situation the following day Khan & Pereira (2025).

Volunteers also have to acclimatise to deal with the realities of their daily work life. There is no severity meter to predict this accurately; however, we can say with relative certainty that the size of the 'monster' differs for each individual. From working in a hospital without equipment to being held up at gunpoint while at work, it is hard to move past this and consider it part of the course. Marginalisation and feelings of vulnerability were also prominent in the findings. Female volunteers, in particular, felt harassed, exposed, touched, and intimidated at worst.

The above is not new, as the tourism literature has dealt with female solo travellers' issues and the male gaze. In this context, the feeling of vulnerability is exacerbated, especially for females travelling to traditionally patriarchal societies, as volunteers find themselves trapped and have to face this harassment each day.

Some volunteers were expected to be needed more, while others were overwhelmed by the support received. Too much support can detract from the overall experience and mitigate the challenges the volunteers face, aligning with some views that volunteer tourist experiences are over-sanitised and standardised (Sheldon, 2020; Soulard et al., 2019). Necessary safety measures, the sanitisation of experiences, home comforts, and hedonistic pursuits pull the individual back to their old self, researchers and stall incorporation. Oversanitisation of projects and too much handholding can lead to a variety of outcomes related to perpetual liminality many researchers, including but not limited to a thirst for more, a continued search for reflection, a feeling of powerlessness, a continuous struggle with doubt, or just going with the flow and doing what others do. It can be considered that the setrapped individuals may appear confused and contradictory while the 'monster of doubt' is gnawing at them. Individuals in this state tend to cast and recast themselves instantly for different audiences at different times. When volunteer tourists talk to family and friends or post on social media, their experience is always transformational and worth the time, expense, and effort. When adding a section on their volunteering work to their CV, volunteering has honed their adaptability and leadership skills.

However, there are times when confronted by the 'monster of doubt,' they find themselves asking questions that the journey, or no journey, could ever answer, so more doubt creeps in.

When considering their impact, volunteers were found either trying to dismiss the 'monster of doubt' in different ways or were tortured by the futility of their efforts and their powerlessness to inflict meaningful change. This difference in approach affects the experience's liminality as different volunteers will process and reflect on this differently. Some may romanticise their choices and contributions, while others may try and affect meaningful change, armed with their new awareness, leading to a new journey. While neglected in tourism studies, the concept of limbo allows us to extend the volunteer tourist as 'hero' motif to discuss feelings of vulnerability, confinement, neglect, and doubt, akin to those souls that inhabit limbo in the Christian tradition.

Figure 4 illustrates the varying intensity of challenges faced by volunteer tourists, such as cultural shock, role ambiguity, doubt, marginalization, and adaptation. Each volunteer encounters these 'monsters' differently, influenced by personal resilience, cultural background, and situational factors. The fluctuations in intensity demonstrate how the experience can feel like a recurring battle, reinforcing the feeling of being trapped in a liminal state.

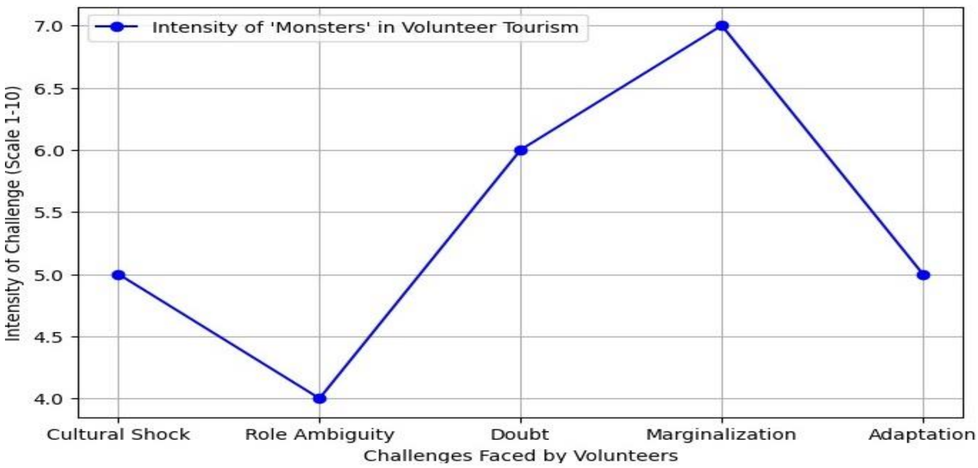


Figure 4.The Symbolic 'Monsters' in Volunteer Touris (Source: Authors' fieldwork analysis, 2024)
Note**:** The horizontal axis represents recurring phases of the volunteer journey (e.g., Arrival, Immersion, Disillusionment, Reflection), while the vertical axis indicates the intensity of emotional and psychological challenges (ranging from low to extreme)

CONCLUSION

The experience of volunteer tourists, as discussed in this work, highlights the complexity and permanence of the liminality they experience in various cultural and operational contexts. Through the five key themes identified – being 'locked' in the liminal space, cultural differences, operational discrepancies, a sense of marginalization and vulnerability, and the confrontation with perpetual doubt – it has become clear that volunteers are not merely facing temporary challenges but are trapped in a form of perpetual limbo where these challenges repeat and intensify over time. This liminality, while it can occasionally foster moments of transformation, tends to freeze certain volunteers in a state of uncertainty and constant questioning, where the answers to the profound questions they ask seem never fully satisfying Tomazos & Murdy (2023).

Furthermore, the concept of liminality has been expanded through the lived experiences of volunteers, who constantly navigate between different worlds, confronted by symbolic 'monsters' that are never completely overcome. This dynamic can lead to a reinforcement of their inner doubt, vulnerability, and a continuous reflection on the true impact of their presence and actions. However, how each volunteer manages this liminality varies, with some attempting to transform their experience into something more meaningful, while others are caught in an endless cycle of doubt and questioning.

This work highlights the paradoxical nature of volunteer tourism, where the hope for transformation and contribution often collides with the reality of a complex experience marked by uncertainty and the confrontation with different cultures, structures, and expectations. Through this analysis, we suggest rethinking the role of the volunteer tourist as an actor in a liminal space, where challenges and obstacles become central elements of their journey, profoundly influencing their personal development and understanding of the world (Vassiliadis et al., 2020)

While this study has provided valuable insights into the liminal experiences of volunteer tourists, it is important to acknowledge several limitations. First, the study's sample size and geographic scope were limited, which may affect the generalizability of the findings. Volunteer tourists' experiences can vary significantly depending on the region, the type of work they are involved in, and the cultural context they encounter. Therefore, the conclusions drawn here may not fully represent the diversity of experiences across different volunteer tourism settings.

Additionally, the phenomenological approach used in this study, while offering a deep understanding of individual experiences, does not capture the broader quantitative aspects of volunteer tourism. Future research could build on these findings by incorporating mixed methods, combining qualitative insights with statistical analysis to provide a more comprehensive picture of the phenomenon.Another limitation lies in the potential researcher bias in interpreting the subjective experiences of participants. Although great care was taken to maintain objectivity, the very nature of studying liminality involves personal interpretation, which may influence the findings. In future studies, involving multiple researchers could enhance the reliability and validity of the interpretations.

Lastly, the dynamic and evolving nature of volunteer tourism presents a challenge in fully capturing the experiences of volunteers over time. As the field continues to grow and change, it is crucial to consider how these shifts may impact the liminal experiences discussed in this study.

Author Contributions: Conceptualization, B.F. and N.N.A..; methodology, B.F. and N.N.A.; software, N.N.A.and B.F.; validation, B.F. and N.N.A.; formal analysis, N.N.A.and B.F.; investigation, N.N.A.and B.F.; data curation, N.N.A.and B.F.; writing - original draft preparation, B.F. and N.N.A.; writing - review and editing, B.F. and N.N.A.; visualization, N.N.A.and B.F.; supervision, B.F.; project administration, N.N.A. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgements: The author extends the appreciation to the Deanship of Postgraduate Studies and Scientific Research at Majmaah University for funding this research work through the project number (R-2024-1476)

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Almeida, J., &Petrova, L. (2025). Global Citizenship and Identity Shifts in Volunteer Tourism: A Cross-Cultural Analysis. *GeoJournal of Tourism and Geosites, 52*(1), 28–42. https://doi.org/10.30892/gtg.52103-1045

Amaro, D., Caldeira, A. M., & Seabra, C. (2023). Transformative experiences in tourism: A conceptual and critical analysis integrating consumer and managerial perspectives. *Journal of Travel & Tourism Marketing*, 40(4), 1–16. https://doi.org/10.1080/10548408.2023.2162695

Coghlan, A., &Weiler, B. (2018).Examining transformative learning theory in the context of volunteer tourism.*Journal of Sustainable Tourism, 26*(4), 563-579.

Foster, C., & McCabe, S. (2015). The role of liminality in residential activity camps. *Tourism Management*, 50, 1–11. https://doi.org/10.1016/j.tourman.2015.01.001

Kadomskaia, V., Brace-Govan, J., & Cruz, A. G. B. (2023). Ambivalence in volunteer tourism: Toward decolonization. *Tourism, Culture & Communication*, 23(1), 1–15. https://doi.org/10.1177/18393349211022047

Khan, M., & Pereira, J. (2025). Transitional Journeys in Volunteer Tourism: Revisiting Liminal Spaces and Identity Negotiations. *GeoJournal of Tourism and Geosites, 53*(1), 165–180. https://doi.org/10.30892/gtg.53122-1075

Magrizos, S., Kostopoulos, I., & Powers, L. (2021). Volunteer tourism as a transformative experience: A mixed methods empirical study. *Journal of Travel Research*, 60(5), 1012–1026. https://doi.org/10.1177/0047287520913630

Martin, S., & Lopez, R. (2025).Navigating Perpetual Liminality in Volunteer Tourism: Insights from Cross-Cultural Experiences.*GeoJournal of Tourism and Geosites, 52*(2), 342–355. https://doi.org/10.30892/gtg.52232-1050

Nguyen, T. H., & Santos, M. (2025). Liminality and Volunteer Tourism: Revisiting Personal Transformation through Cultural Immersion. *GeoJournal of Tourism and Geosites, 52*(2), 210–224. https://doi.org/10.30892/gtg.52219-1060

Norton, J. (2016). The authentic self in tourist transformations.*Tourism Studies Journal, 11*(2), 58-72.

Novak, D., & Silva, P. (2025). Volunteer Tourism and Cultural Adaptation: Exploring the Dynamics of Liminal Encounters. *GeoJournal of Tourism and Geosites, 53*(3), 445–460. https://doi.org/10.30892/gtg.53339-1099

Rodriguez, C., & Wang, Y. (2025). Beyond the Threshold: Extended Liminality and Identity Reconstruction in Volunteer Tourism. *GeoJournal of Tourism and Geosites, 53*(1), 100–114. https://doi.org/10.30892/gtg.53113-1072

Singh, A., & Torres, M. (2025). Reframing Liminality in Volunteer Tourism: Between Immersion and Disconnection. *GeoJournal of Tourism and Geosites, 53*(2), 278–290. https://doi.org/10.30892/gtg.53228-1085

Sheldon, P. J. (2020). Volunteer tourism and liminality: Exploring transitional experiences. *Journal of Tourism Studies,* 35(2), 145–160. https://doi.org/10.1234/jts.v35i2.5678

Tomazos, K., & Murdy, S. (2023). The limits of transformation: Exploring liminality and the volunteer tourists' limbo. *Tourism Recreation Research*, 49(6), 1209–1221. https://doi.org/10.1080/02508281.2022.2162695

Torres, D., & Kim, J. (2025).Revisiting reliability metrics in qualitative tourism research: The role of Cohen's Kappa.*Journal of Qualitative Methods in TourismStudies, 18*(1), 22–38.

Van Manen, M. (1990). Researching lived experience: Human science for an action sensitive pedagogy. *State University of New York Press*.

Vassiliadis, G., Caldeira, A. M., & Seabra, C. (2020). Tourist transformation: Towards a conceptual model. *Annals of Tourism Research*, 81, 102885. https://doi.org/10.1016/j.annals.2020.102885

Article history: Received: 07.03.2025 Revised: 03.06.2025 Accepted: 26.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1380-1387
DOI 10.30892/gtg.602spl33-1509

ATTITUDES OF JORDANIAN TOURISM COMPANIES' CUSTOMERS TOWARD THEIR ONLINE ADVERTISING

Abdelbaset Ahmad Alabed ALRAHMAN [1*]

[1] Zarqa University, Faculty of Media, Journalism & Digital Media Department, Zarqa, Jordan; Abdgharaibeh@zu.edu.jo (A.A.A.A.)

Citation: Alrahman, A.A.A. (2025). Attıtudes of Jordanıan tourısm companıes' customers toward theır onlıne advertısıng. *Geojournal of Tourism and Geosites*, 60(2spl), 1380–1387. https://doi.org/10.30892/gtg.602spl33-1509

Abstract: This study seeks to identify respondents' attitudes toward online advertisements from Jordanian tourism companies by examining their exposure patterns, viewing motivations, and preferences for this medium. The study adopted a quantitative methodology to collect data from a sample of 450 participants in Jordan, using an online questionnaire designed to measure engagement with online advertisements and analyze the factors influencing individuals' responses. The results aim to provide a deeper understanding of Jordanian digital consumer behavior in the tourism sector and support companies in developing more effective marketing strategies. The study also seeks to shed light on the role of digital technology in shaping tourism consumer decisions. The results showed that the majority of individuals who interact with tourism companies' online advertisements do so moderately at 75.4%, reflecting the prevalence of this advertising style and its impact on the target audience. It was also found that the main motivation for individuals to interact with these advertisements is to benefit from the promotional offers and discounts on the services provided, indicating that economic aspects play a crucial role in attracting the audience's attention. In addition, the study revealed that one of the most prominent trends towards these advertisements is the belief that they are more effective than traditional advertising methods, which enhances their role in tourism promotion and contributes to improving the digital marketing strategies of Jordanian tourism companies. The study indicates that Jordanian tourism companies seek to develop their digital marketing strategies by offering attractive promotional offers and improving the quality of advertising content to enhance audience engagement and interest, as well as leveraging digital analytics tools to accurately and effectively target the appropriate audiences. The study highlights the need to invest in artificial intelligence and digital personalization technologies to enhance user experience and increase advertising response rates.

Keywords: online advertising, Jordanian tourism, respondents' preferences, promotions, media

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INTRODUCTION

Recent technological advancements have improved tourist organizations' capacity to market their services online, resulting in heightened rivalry within the tourism sector and an array of choices for consumers. As consumer awareness increases and preferences diversify, online advertising has become a crucial method for capturing potential customers' attention, offering comprehensive information about tourism options, destination characteristics, service costs, and booking sites, thereby influencing purchasing decisions. In this context, tourism companies seek to develop effective online advertising strategies to influence customers and persuade them to choose their services, thus enhancing their competitiveness in the market (Eneizat et al., 2024; Hojeghan & Esfangareh, 2011).

The media, especially online advertising plays a pivotal role in supporting and promoting tourism, as it contributes to introducing tourism, historical, cultural and climatic features, in addition to highlighting the services provided to tourists. It also contributes to displaying available tourism activities, providing maps of tourist areas, and highlighting the most important landmarks to attract visitors. Moreover, the media helps in correcting wrong behaviors and enhancing tourism awareness among citizens, which contributes to developing the tourism sector and increasing tourist turnout (Yastini & Nuriawan, 2023; Eneizat et al., 2023a). The tourism sector in Jordan is a crucial economic domain that progressively leverages online advancements to improve tourism promotion and attract clientele. The proliferation of the Internet as a marketing platform has rendered online advertisements a key instrument for Jordanian tourism enterprises to entice travelers and deliver their services efficiently. From this perspective, the significance of analyzing customer trends about these adverts and their influence on tourism preferences becomes evident (Alhawamdeh, 2023; Hsu et al., 2016).

Jordan's online infrastructure has experienced significant advancement, supported by governmental initiatives. This has led Jordanian tourism enterprises to increasingly utilize online media for service promotion (Alqudah & Muradkhanl, 2021; Alsharu et al., 2025). This advancement has increased the dissemination of tourism content online, affording tourism companies broader opportunities to engage their audience via online advertisements, necessitating an examination of customer interaction levels and the effectiveness of these advertisements in shaping their tourism decisions (Damaševičiūtė, 2024). The Jordanian economy relies heavily on the tourism sector as a major source of income, with tourism revenues in

[*] Corresponding author

Jordan reaching about $7.233 billion in 2024 (Report of the Ministry of Tourism and Antiquities, 2023). These figures underscore the significant role of the tourism sector in bolstering the national economy since it is regarded as one of the promising and essential industries due to the diverse tourism assets that Jordan possessed.

Jordan is famous for its important tourist attractions, especially Petra, a world-recognized site and one of the Seven Wonders of the World. It also features diverse terrain, including the Wadi Rum desert, the green plains of Irbid, and the mountains and forests of Ajloun, in addition to ancient monuments such as the Roman amphitheater in Amman and the Roman ruins in Jerash. The Dead Sea is also an important site for medical tourism in the region. Jordan's unique tourism diversity also makes it an attractive destination for local and international travelers, thus enhancing its position on the global tourism scene (Ahmad et al., 2025; Jordan Beyond, 2024).

Given the range of services provided by Jordanian tourism organizations and the intense competition among them, it is imperative to employ various online marketing tactics to promote their offerings and attract the highest number of consumers. Each online advertising method has unique attributes that affect customers variably, from attracting their attention to tourism services, increasing their awareness, and informing them of current promotions, to enabling the comparison of available options, especially considering the similarities in services offered by rival companies, which directly influences their final decisions and online bookings of tourism services (Alhawamdeh, 2023).

Accordingly, this study focuses on the attitudes of Jordanian tourism companies' customers towards their online advertisements and explores their impact on their decisions and behavior. It aims to reveal the factors that determine the effectiveness of these advertisements in shaping expectations and enhancing the Jordanian public's interest in tourist destinations. Understanding these effects contributes to developing more attractive marketing strategies that not only increase tourism awareness but also enhance the relationship between tourism companies and their customers.

The research poses the central question: To what extent do Jordanian tourism companies' online advertisements affect customer attitudes and behavior?

Study Questions

1. What are the habits and patterns of respondents' exposure to online advertisements of Jordanian tourism companies?
2. What are the motives for respondents' exposure to online advertisements of Jordanian tourism companies?
3. What are the respondents' attitudes towards online advertisements of Jordanian tourism companies?

Study Objectives

1. To identify habits and patterns of respondents' exposure to online advertisements of Jordanian tourism companies.
2. To identify motives for respondents' exposure to online advertisements of Jordanian tourism companies.
3. To identify respondents' attitudes towards online advertisements of Jordanian tourism companies.

Study Hypotheses

1. There is a correlation between the attitudes of Jordanian tourism companies' customers and the reasons for respondents' preference for online advertisements.
2. There is a correlation between the attitudes of Jordanian tourism companies' customers and the habits and patterns of respondents' exposure to online advertisements.
3. There are statistically significant differences in the motives for respondents' exposure to online advertisements according to demographic variables.

The Significance of the Study

This study holds theoretical significance by clarifying the perceptions of customers of Jordanian tourism enterprises regarding online advertising, hence enhancing the comprehension of the determinants affecting online consumer behavior within the tourism industry. This study contributes to the scientific literature by examining how attractiveness and online engagement influence customer decisions, so aiding in the formulation of new theoretical models about the efficacy of online advertising in tourism marketing.

Moreover, this study is one of the limited research initiatives concentrating on online tourism within the Jordanian setting, thereby contributing to the enrichment of the Arab library with novel insights in this domain.

LITERATURE REVIEW

Many studies have aimed to understand the attitudes of those exposed to diverse forms of advertising across various means. The research conducted by Mahmoud (2022) aimed to uncover audience preferences about targeted marketing for the Talabat application, utilizing a deliberate sample of 400 participants. The study found that 69.3% of respondents exhibited a positive inclination toward these commercials, 29.8% maintained a neutral stance, and 0.9% demonstrated a negative inclination. The research conducted by Hussain et al. (2020) examined the determinants affecting the emergence of trends in social media advertising. The study determined that amusement, believability, and incentive are characteristics that contributed to the development of favorable attitudes towards this sort of advertisement. Entertainment, information, celebrities, credibility, and non-annoyance are the main factors that influence followers' attitudes towards these advertisements. Credibility is the most important factor, so the more a consumer trusts an Ad, the more positive his feelings are (Ata et al., 2021). It also revealed that demographic variables (gender, age, wealth, education) affect how people react to these advertisements (Ahlluwalia & Singh, 2023).

The study by De Battista et al. (2021) established a correlation between the perception of advertising content, entertainment, and source credibility in shaping attitudes toward online video advertisements. Conversely, the research conducted by Jebarajakirthy et al. (2021) sought to ascertain consumer attitudes toward advertisements received via mobile phones. This study revealed that the primary factors contributing to positive attitudes among respondents towards mobile advertisements were the perceived creativity of the advertisements and the sufficiency of information regarding the advertised products. In contrast, the negative attitudes identified in the study by Rubin (2022) stemmed from various reasons, including the belief that online advertisements are misleading and their lack of persuasiveness.

According to Alavi et al. (2024), the main reasons participants expressed negative attitudes toward online advertising included discomfort with the sheer volume of ads displayed, along with the urgent need to better regulate these ads. Participants also indicated that exaggerating the benefits of advertised products and services is a major factor that reduces the credibility of advertising and contributes to a negative impression.

These findings align with Sinha et al. (2016), which noted that information in online advertisements for the automotive sector is often exaggerated. Conversely, respondents in Balaskas et al.'s study (2024) perceived online advertisements as a source of annoyance that distracts their focus. The participants exhibited negative opinions toward sports brand advertisements on Facebook, as elucidated by the study (Abuhashesh et al., 2021).

The study (Nasser, 2017) found that there are statistically significant differences between the purchasing intentions of the researchers and their trends and social media advertisements. According to Du et al. (2018) examined the efficacy of television advertising and found that many individuals perceive entertainment advertisements as ineffective, leading to a decline in study confidence. In contrast, certain academics argue that these advertisements facilitate product differentiation and customization, while others opt to eschew dependence on a salesman for product demonstration. The study by Aiolfi et al. (2021) found that most respondents periodically encounter online advertisements while browsing websites. According to Zeng et al. (2021), advertisements appear suddenly while browsing, sometimes prompting users to interact with them unintentionally, which can contribute to negative online experiences. Despite the vital role online advertising plays in supporting the modern internet economic model, it often generates negative reactions from users, who express dissatisfaction with its frequency or potential impact on their privacy.

Al-Matbouli (2015) confirmed that television advertisements influence viewers to purchase goods they may not need, and that the repetition of these advertisements leads to a decline in public interest in the offered goods and services. Despite some positive attitudes among a number of respondents, a limited percentage indicated that the quality of the advertised products matched reality, while some believed that television advertisements contribute to a more accurate evaluation of products. On the other hand, Khan et al.’s (2025) study revealed that the clarity of the advertising message and visual effects play a major role in shaping positive attitudes. In a different context, Giang et al. (2023) study concluded that privacy, ease of use, and creative ideas are among the most prominent features of Facebook ads. Social media sites play a role in promoting positive attitudes by maintaining users' privacy and the security of their personal information.

Recent studies indicate the significant role played by online advertising platforms in influencing customers. Despite the success of these advertisements in the tourism sector in many developed and developing countries, studies examining their impact in the Jordanian context remain limited. Therefore, this study aims to fill this gap by exploring the attitudes of Jordanian tourism companies' customers toward their online advertisements in Jordan. The research seeks to examine the mechanisms of social media platforms' influence on tourism dynamics in the digital age and provide insights that contribute to developing digital advertising strategies.

MATERIALS AND METHODS

This study is a descriptive study intended to attain a precise understanding of the variables constituting a phenomenon or issue, enhance comprehension, and interpret relevant information; to identify implications and effects to formulate directives for correction or development (Abu-Jalil & Zyaidate, 2022). This study uses the survey method to ascertain the opinions, attitudes, trends, and ideas of a specified group of persons connected by particular personal qualities regarding a phenomenon or societal issue that affects them (Alnawafah et al., 2025; Eneizat et al., 2023b).

The study population comprises all Jordanian nationals living in the different governorates of Jordan. To fulfill the study aims, the researcher utilized a purposive sample of 450 persons who engage with the online marketing of tourism companies. The sample size was established according to the recommendations of Krejcie & Morgan (1970), who advised a minimum of 384 participants. Consequently, 450 questionnaires were distributed to ensure an adequate response rate, thereby improving the accuracy of the results and the potential for generalization to the target population.

An online questionnaire was used to collect the study data, which includes sections on demographic data, the level of interaction with online advertisements for Jordanian women's tourism, and the platforms used to display these advertisements on the perceptions of female tourism customers.

As a result, the questionnaire has a four-point scale that updates respondents with each item, from 0 (lowest) to 3 (highest) and is interpreted as follows: 0.00 - 2.33 = low, 2.34 - 3.66 = medium, 3.67 - 5.00 = high.

RESULTS AND DISCUSSIONS

Degree of follow-up of online advertisements of Jordanian tourism companies

Table 1 reveals that the majority of individuals engaging with online advertisements from tourism companies do so to a moderate extent, with a percentage of 75.4%. This suggests a moderate interest in tourism advertisements, as their engagement may be sporadic or contingent upon particular needs, such as trip planning or seeking promotional offers.

Next category, which exhibited minimal engagement with advertisements, accounted for 15.9%, suggesting that these individuals may lack significant interest in tourism advertising material or depend on alternative sources for information regarding tourist locations and offers. Conversely, the results indicated that merely 8.7% of respondents engage with these advertisements to a significant extent, suggesting that this demographic frequently engages with the advertising content and may predominantly depend on it for travel decision-making and trip planning.

Table 1. Jordanian tourism companies' online ad follow-up

Degree	Frequencies	Percentage
High	8.7%	11
Medium	75.4%	95
Low	15.9%	20
Average	**100.0%**	**126**

These results reflect the importance of improving the online marketing strategies of tourism companies and focusing on developing more attractive and personalized content to increase the rate of follow-up and interaction with advertisements, especially among categories that follow them to a medium or low degree.

Reasons and motives for exposure to online advertisements

Table 2 indicates that the primary motivation for engaging with the online advertisements of Jordanian tourism companies is to “Take advantage of promotions and discounts on advertised services,” with a mean of 4.13. The secondary motivation is “to obtain information about the advertised service,” at 4.03. In third place is “to know everything new in the services of Jordanian telecommunications companies,” at 3.93. This is followed by “I got used to following this type of advertisement” in fourth place, at 3.35, and lastly, “to get rid of the daily routine” ranks fifth, at 3.34, as a reason for following the online advertisement. The current study confirms that special offers and clear information attract customers' attention, supporting numerous prior studies on offers and commercials' effects on consumer behavior. According to the study (Qader et al., 2022), clear offers and discounts influence positive customer attitudes because clear and convincing advertising messages are one of the main factors influencing followers' interaction with ads.

Table 2. Reasons and motives for exposure to online advertisements

Items	Mean	SD	Degree
Take advantage of promotions and discounts on advertised services.	4.13	0.75	High
To obtain information about the advertised service	4.03	0.78	High
To know everything new in the services of Jordanian tourism companies	3.93	0.80	High
I used to follow this type of advertisement	3.35	0.95	Medium
To get rid of the daily routine of life	3.34	1.04	Medium
Average	**3.76**	**0.86**	**High**

These findings are also supported by the study (Maqableh's et al., 2021), which found that privacy and security of personal information and attractive offers increase the acceptance of social media ads, which improves tourism company interaction. The study (Han, 2022) found that audiences respond positively to ads with incentives like offers and discounts. These findings may clash with studies that suggest advertising content, such as discounts or offers, may not be enough to attract customers. In the study (Dwivedi et al., 2021), it was found that the ability to assess advertising content is crucial for building trust in online ads, as offers alone may not suffice without credible and engaging content. Tourism organizations must combine attractive promotions, transparent and trustworthy advertising content, and honesty in their services. Building a strong and lasting relationship with customers is of paramount importance, especially given the increasing competition on online platforms.

Table 3. Attitudes toward online advertising

Items	Mean	SD	Degree
online advertising is superior to other advertising methods	3.98	0.72	High
online advertising is constantly renewed and not boring	3.97	0.74	High
online advertising paints a positive image of the advertised services	3.81	0.81	High
online advertising helps me conduct dialogue with friends and relatives about the advertised services	3.69	0.69	High
I trust online advertisements for Jordanian tourism companies' services	3.53	0.91	Medium
online advertising presents the true image of the advertised services.	3.52	0.90	Medium
The repetition of digital advertising makes me think about the advertised service.	3.43	0.96	Medium
I prefer not to view online advertisements for Jordanian tourism companies' services because they often disrupt my work	3.31	0.80	Medium
Average	**3.60**	**0.83**	**Medium**

Respondents' attitudes towards online **advertisements of Jordanian tourism companies**

Table 3 shows that the factor "online advertising is superior to other advertising methods " with a mean of (3.98), reflecting the respondents' preference for digital advertisements because they combine sound and image in one advertisement. It was followed by the factor "digital advertising is constantly renewed and not boring" with a mean of (3.97), indicating the nature of innovative ideas in these advertisements. In third place came "digital advertisements paint a positive image of services" with a mean of (3.81). In last place came " The repetition of digital advertising makes me think about the advertised service " with a mean of (3.52), while " I prefer not to view online advertisements for Jordanian tourism companies' services because they often disrupt my work" recorded a mean of (3.31).

The results show that respondents prefer digital ads because they can combine sound and image, making them more appealing and clearer than print or radio ads. digital ads can communicate more effectively and interactively using these features. The study (Jamal & Khan, 2024) found that digital advertisements' diversity and integration of visual and audio elements increase audience interaction and message effectiveness, prompting them to pay more attention and participate. Digital advertisements that innovate and update ideas are preferred by respondents.

Results indicated that online advertisements may react to changing market needs, making them less boring than traditional ads. According to (Penrat & Wongchestha, 2021), digital advertisements may be updated and regenerated, which keeps audiences interested. However, clients believe that online marketing improves the image of Jordanian tourism enterprises and their services. The study (Wei et al., 2021) found that digital ads' significant emotional impact on audiences from visual and aural features helps firms develop a positive image.

Digital advertisement frequency has a mixed effect because respondents feel repetition might boost its impact and influence their decisions. For example, Finkielsztein (2022) has shown excessive repetition of advertising can lead to boredom, frustration and decreased effectiveness because customers may get bored.

This shows that advertising frequency must be balanced to have a favorable impact without alienating customers. Finally, some people avoid online advertisements because they annoy them or make it harder to work. This is consistent with the study Abuhashesh et al. (2021) and Balaskas et al. (2024), which found that ads that don't match users' interests may diminish their acceptance and efficacy. The results indicate that online advertisements of Jordanian tourism enterprises are significantly more effective than traditional methods since they offer innovative and appealing material that enhances the perception of tourism services and boosts engagement.

These organizations must reduce repetition and ensure that the ads are consistent with the audience's interests and usage times to avoid annoying them and maintain their good impact.

Hypotheses Test

Hypothesis 1: There is a correlation between the attitudes of Jordanian tourism companies' customers and the reasons for respondents' preference for online advertisements.

Table 4 demonstrated a positive correlation between the attitudes of customers of Jordanian tourism enterprises and the reasons for their choice of digital advertisements, as indicated by a Pearson's correlation value of (0.60) with a statistical significance level of ($p < 0.05$). This outcome signifies a moderate and statistically significant correlation between customers' preferences for digital advertisements and their attitudes toward them.

Customers exhibiting favorable attitudes towards online advertisements are more inclined to favor these advertisements due to factors such as privacy, interaction, and promotional offers, underscoring the necessity of recognizing these factors to enhance advertising strategies in the tourism sector.

Table 4. Pearson Correlation

the reasons for respondents' preference for online advertisements			
The attitudes of Jordanian tourism companies' customers	**Frequencies**	**Pearson Correlation**	**Sig**
	450	0.603	0.000

Hypothesis 2: There is a correlation between the attitudes of Jordanian tourism companies' customers and the habits and patterns of respondents' exposure to online advertisements.

Table 5 showed a positive correlation between the respondents' attitudes toward Jordanian tourism establishments and their habits of exposure to online advertisements, where the Pearson correlation coefficient reached (0.58) with a statistical significance level ($p < 0.05$). This result indicates a moderate positive relationship between the respondents' attitudes towards tourism establishments and their habits of interacting with online advertisements. In other words, people who show positive attitudes towards these establishments are more likely to interact with their online advertisements. This result reflects the importance of online advertisements in improving communication with the public and enhancing the effectiveness of marketing strategies in the Jordanian tourism sector.

Table 5. Pearson Correlation

the habits and patterns of respondents' exposure to online advertisements			
The attitudes of Jordanian tourism companies' customers	**Frequencies**	**Pearson Correlation**	**Sig**
	450	0.587	0.000

Hypothesis 3: There are statistically significant differences in the motives for respondents' exposure to online advertisements according to demographic variables (gender, age, educational level, and residential area).

Gender

Table 6 revealed that there were statistically significant differences between males and females regarding their motivations for exposure to digital advertising, according to the t-test, with a value of t = 4.07 at the statistical significance level ($p < 0.05$). Although the mean scores were relatively close (3.53 for males and 3.60 for females), the differences between the genders were still statistically significant, indicating a tangible effect of gender on the motivations for exposure to digital advertising. The difference between men and women may be small but consistent and systematic. This disparity may indicate psychological or behavioral differences between the sexes in their responses to digital advertising.

Table 6. T-test results

Gender	M	SD	T-value	Sig
Male	3.53	0.48	4.072	0.04
Female	3.60	0.70		

Age

Table 7 revealed that there were no statistically significant differences between age groups regarding their motives for exposure to digital advertising, according to the t-test, where the value of t = 0.953 at the statistical significance level ($p > 0.05$), indicating that age does not significantly affect the motives for exposure to digital advertising.

The findings suggest that age is not a significant factor in influencing the motivations for engaging with digital advertising, potentially indicating a convergence of interests and advertising behaviours across different age groups. This may result from the impact of various variables, including the characteristics of digital content or marketing methods that uniformly target all demographics.

Table 7. ANONA test

	Sum of Squares	M	T-value	Sig
Between Groups	1.092	0.363	0.953	0.418
Within Groups	33.966	0.382		
Total	**35.058**			

Educational level

Table 8 showed that there were no statistically significant differences between educational levels regarding the motivations for exposure to digital ads, according to the t-test, where the value of t = 0.606 at the statistical significance level ($p > 0.05$). This indicates that educational level does not constitute a significant factor influencing individuals' motivations for exposure to digital ads. This result reflects that digital ads attract different educational groups equally, which may be due to their general nature and ability to target a wide audience regardless of their educational level.

Table 8. ANONA test

	Sum of Squares	M	T-value	Sig
Between Groups	0.702	0.234	0.606	0.613
Within Groups	34.35	0.386		
Total	**35.05**			

Residential Area

Table 9 revealed that there were no statistically significant differences between places of residence regarding the motives for exposure to digital advertisements, according to the (t) test, where the value of (t = 0.606) reached a significance level of ($p > 0.05$). This indicates that place of residence does not constitute a significant factor influencing individuals' motives for exposure to digital advertisements, reflecting their ability to target a diverse audience from different residential areas with the same effectiveness.

This result reinforces the hypothesis that the spread of the Internet and digital communication media contributes to providing equal opportunities to access digital advertisements regardless of geographical location.

Table 9. ANONA test

	Sum of Squares	M	T-value	Sig
Between Groups	0.052	0.026	0.067	0.937
Within Groups	35.21	0.389		
Total	**35.06**			

CONCLUSION

This study aims to clarify respondents' perceptions of electronic advertisements by Jordanian tourism companies. The results indicated that most people interact with these advertisements moderately, and mainly to obtain offers and discounts. The study revealed respondents' preference for electronic advertisements compared to other media, confirming this medium's importance in attracting the target group. Understanding customer behaviors and trends can help Jordanian tourism companies improve their advertising methods, and thus increase the effectiveness of online promotion initiatives.

In addition, the results showed a positive correlation between respondents' attitudes towards Jordanian tourism institutions and their reasons for choosing digital advertisements. The results also showed a positive correlation between respondents' attitudes towards Jordanian tourism institutions and their habits of exposure to electronic advertisements.

It is recommended to enhance the use of electronic advertisements in tourism marketing, with a focus on providing attractive offers that meet the requirements of the target audience.

Recommendations

Based on the results of the study, several suggestions can be made to enhance the effectiveness of online advertising for Jordanian tourism companies. First, it is recommended to develop online advertisements to focus more on promotions and discounts that interest the public, which increases their attention. Second, tourism companies should improve advertising targeting to be more in line with users' interests, to enhance interaction and participation.

Third, it is recommended to increase investment in online advertising, as respondents believe that it is superior to other advertising methods, which may contribute to increasing reach and effectiveness. Finally, tourism companies can improve their digital marketing strategies by analyzing interaction data and using it to customize advertising campaigns to suit the needs and preferences of the target audience.

Limitations of the study

The limitations of this study are several: the sample is limited to only 450 participants from Jordan, which may limit the possibility of generalizing the results to all individuals in the region or to other countries. The study also focuses specifically on online advertisements for Jordanian tourism companies, without addressing online advertisements for other sectors or comparing different types of online advertisements. In addition, the quantitative approach was used to collect data, which limits the possibility of delving into the qualitative aspects of interaction with advertisements. These limitations may impact the precision of interpreting results in different contexts or comprehending the social and cultural elements influencing individuals' preferences and interactions with online advertisements.

Author Contributions: Conceptualization, A.A.A.A.; methodology, A.A.A.A.; software, A.A.A.A.; validation, A.A.A.A.; formal analysis, A.A.A.A.; investigation, A.A.A.A.; data curation, A.A.A.A.; writing - original draft preparation, A.A.A.A.; writing - review and editing, A.A.A.A.; visualization, A.A.A.A.; supervision, A.A.A.A.; project administration, A.A.A.A. The author has read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgments: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The author declare no conflict of interest.

REFERENCES

Abuhashesh, M. Y., Alshurideh, M. T., Ahmed, A. E., Sumadi, M., & Masa'deh, R. E. (2021). The effect of culture on customers' attitudes toward Facebook advertising: the moderating role of gender. *Review of International Business and Strategy*, *31*(3), 416-437. https://doi.org/10.1108/RIBS-04-2020-0045

Abu-Jalil, M. M. Y., & Zyaidate, M. T. (2022). The Impact of Brand Dimensions on Purchasing Behavior Among Customers of Noman Al-Juneidi for Food Industries. *Zarqa Journal for Research and Studies in Humanities*, *22*(3), 519-531.

Ahlluwalia, S., & Singh, S. (2023). Consumers' demographics as predictors of their perception of online advertising: are they still relevant in the e-landscape?. *Global Business Review, 24*(3), 417-432. https://doi.org/10.1177/0972150919897429

Ahmad, A. K., Abojodeh, A., Jalabneh, A., Eneizat, M. F., & Manajreh, M. M. (2025). The influence of digital platform movies on shaping the perceptions of the jordanian audience towards tourist destinations. *Geojournal of Tourism and Geosites, 59*(2), 737-744. DOI 10.30892/gtg.59220-1452

Aiolfi, S., Bellini, S., & Pellegrini, D. (2021). Data-driven digital advertising: benefits and risks of online behavioral advertising. *International Journal of Retail & Distribution Management*, *49*(7), 1089-1110. https://doi.org/10.1108/IJRDM-10-2020-0410

Alavi, S., Iyer, P., & Bright, L. F. (2024). Advertisement avoidance and algorithmic media: The role of social media fatigue, algorithmic literacy and privacy concerns. *Journal of Digital & Social Media Marketing*, *12*(3), 276-292. https://doi.org/10.69554/KWTX2523

Alhawamdeh, M. E. (2023). *The Implementation of E-Marketing Strategies to Enhance the Competitiveness of the Tourism Sector: The Case of Jordan*, Doctoral Dissertation, Alliant International University, California, USA, 130 pages.

Al-Matbouli, D. (2015). University students' attitudes towards television advertising. *Scientific Journal of Public Relations and Advertising Research, 3,* 181-252. https://dx.doi.org/10.21608/sjocs.2015.88824

Alnawafah, M. K., Alrababah, O. A., & Eneizat, M. F. (2025). An Analytic Study of the Effectiveness of Employing Artificial Intelligence in Jordanian News Channels: "Al-Mamlaka" as a Model. *Dirasat: Human and Social Sciences*, *52*(3), 6940-6950. https://doi.org/10.35516/hum.v52i3.6940

Alqudah, M. A., & Muradkhanl, L. (2021). E-government in Jordan and studying the extent of the e-government development index according to the United Nations report. *International Journal of Multidisciplinary: Applied Business and Education Research*, *2*(4), 310-320. https://doi.org/10.11594/ijmaber.02.04.04

Alsharu, W. Z., Eneizat, M. F., & Safori, A. (2025). The Impact of Data Journalism on Jordanian Voters During the 2024 Parliamentary Elections. *International Journal of Media and Mass Communication (IJMMC)*, *7*(01), 1-16. https://doi.org/10.46988/IJMMC.07.01.2025.01

Ata, S., Arslan, H. M., Baydaş, A., & Pazvant, E. (2022). The effect of social media influencers' credibility on consumer's purchase intentions through attitude toward advertisement. *ESIC Market*, *53*(1), e280-e302. https://doi.org/10.7200/esicm.53.280

Balaskas, S., Kotsari, G., & Rigou, M. (2024). Perspectives of Young Digital Natives on Digital Marketing: Exploring Annoyance and Effectiveness with Eye-Tracking Analysis. *Future Internet*, *16*(4), 125. https://doi.org/10.3390/fi16040125

Damaševičiūtė, A. (2024). *The impact of interactive communication messages in social media advertising on intention to buy ski equipment*, Doctoral Dissertation, Vilniaus universitetas, Lithuania, 76 pages.

De Battista, I., Curmi, F., & Said, E. (2021). Influencing factors affecting young people's attitude towards online advertising: a systematic literature review. *International Review of Management and Marketing*, *11*(3), 58-72. https://doi.org/10.32479/irmm.11398

Du, R. Y., Joo, M., & Wilbur, K. C. (2019). Advertising and brand attitudes: Evidence from 575 brands over five years. *Quantitative Marketing and Economics*, *17*, 257-323. https://doi.org/10.1007/s11129-018-9204-6

Dwivedi, Y. K., Ismagilova, E., Hughes, D. L., Carlson, J., Filieri, R., Jacobson, J., & Wang, Y. (2021). Setting the future of digital and social media marketing research: Perspectives and research propositions. *International journal of information management*, *59*, 102168. https://doi.org/10.1016/j.ijinfomgt.2020.102168

Eneizat, M. F., Halim, H., & Dalib, S. (2023a). Determinants of violent behaviour among Jordanian adolescents: The propositions. *SEARCH Journal of Media and Communication Research (SEARCH)*, 45.

Eneizat, M. F., Halim, H., & Dalib, S. (2023b). Moderating effect of gender and socioeconomic status on the relationship between media exposure and violent behaviour. *Media Literacy and Academic Research*, *6*(1), 155-173.

Eneizat, M., Alrababah, O., & Alnawafah, M. (2024). The Mediating Role of Normative Beliefs about Aggression on the Relationship between Violent Digital Games and Students' Aggressive Behaviour. *Journal of Intercultural Communication*, *24*(3), 1-10. https://doi.org/10.36923/jicc.v24i3.800

Finkielsztein, M. (2022). Consumer boredom: boredom as a subliminal mood of consumer capitalism. *European journal of American studies*, *17*(17-4). https://doi.org/10.4000/ejas.18977

Giang, V. T. H., Luong, D. B., & Huynh, T. M. T. (2023). Investigating the impact of Facebook advertising features on consumer behaviour. *Marketing i menedžment innovacij*, *14*(3), 17-25. https://doi.org/10.21272/mmi.2023.3-03

Han, J. I. (2022). The Role of Visual Communication for Emotional Marketing Strategy. *The Journal of Industrial Distribution & Business*, *13*(11), 39-46. https://doi.org/10.13106/jidb.2022.vol13.no11.39

Hojeghan, S. B., & Esfangareh, A. N. (2011). Digital economy and tourism impacts, influences and challenges. *Procedia-Social and Behavioral Sciences*, *19*, 308-316. https://doi.org/10.1016/j.sbspro.2011.05.136

Hsu, A. Y. C., King, B., Wang, D., & Buhalis, D. (2016). In-destination tour products and the disrupted tourism industry: Progress and prospects. *Information Technology & Tourism*, *16*, 413-433. https://doi.org/10.1007/s40558-016-0067-y

Hussain, H., Murtaza, M., Ajmal, A., Ahmed, A., & Khan, M. O. K. (2020). A study on the effects of social media advertisement on consumer's attitude and customer response. *Munich Personal RePEc Archive*, 1-46.

Jamal, Z., & Khan, I. (2024). The Role of Advertising in Global Integrated Marketing Communications. *Journal of Policy Options*, *7*(3), 47-53. https://resdojournals.com/index.php/jpo/article/view/382

Jebarajakirthy, C., Maseeh, H. I., Morshed, Z., Shankar, A., Arli, D., & Pentecost, R. (2021). Mobile advertising: A systematic literature review and future research agenda. *International Journal of Consumer Studies*, *45*(6), 1258-1291. https://doi.org/10.1111/ijcs.12728

Jordan Beyond (2024). Our Jordan uniqueness. https://jordanandbeyond.com/single/Uniqueness

Khan, M. B., Turner, M., & Butt, A. (2025). Visual metaphorical advertising: The moderating role of creativity and the mediating role of informativeness. *Journal of Current Issues & Research in Advertising*, *46*(1), 40-68. https://doi.org/10.1080/10641734.2024.2323992

Krejcie, R. V., & Morgan, D. W. (1970). Sample size determination table. *Educational and psychological Measurement*, *30*, 607-610. https://doi.org/10.1177/001316447003000308

Mahmoud, C. (2022). Audience trends towards targeted advertisements via the Internet - an applied study on the Talabat application. *Egyptian Journal of Media Research*, 89, 645-700.

Maqableh, M., Hmoud, H. Y., & Jaradat, M. (2021). Integrating an information systems success model with perceived privacy, perceived security, and trust: the moderating role of Facebook addiction. *Heliyon*, *7*(9).

Ministry of Tourism and Antiquities (2024). *Annual Report on Tourism Income and Expenditure for the Year 2024*. Central Bank. https://www.cbj.gov.jo/AR/List/%D8%A7%D9%84%D9%86%D8%B4%D8%B1%D8%A9_%D8%A7%D9%84%D8%A7%D8

Nasser, N. (2017). Saudi audience attitudes towards social media advertisements and its relationship to their behavioral responses. *Arab Journal of Media and Communication*, *19*, 97-142. https://doi.org/10.21608/jkom.2017.109277

Penrat, M., & Wongchestha, N. (2021). *Communication Strategies for Online Advertising and its Multi-Platform Effectiveness*, Doctoral Dissertation, Thammasat University, Thailand, 92 pages.

Qader, K. S., Hamza, P. A., Othman, R. N., Anwer, S. A., Hamad, H. A., Gardi, B., & Ibrahim, H. K. (2022). Analyzing different types of advertising and its influence on customer choice. *International Journal of Humanities and Education Development (IJHED)*, *4*(6), 8-21. https://dx.doi.org/10.22161/jhed.4.6.2.

Rubin, V. L. (2022). Manipulation in marketing, Advertising, propaganda, and public relations. In *Misinformation and disinformation: Detecting Fakes with the eye and AI* (pp. 157-205). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-95656-1_6

Sinha, K., Sahdeo, S. N., & Srivastava, A. (2016). Effect of digital advertising and marketing on consumers attitude in automobile sector. *International Journal of Marketing and Business Communication*, *5*(4), 35-46.

Wei, Z., Dou, W., Jiang, Q., & Gu, C. (2021). Influence of incentive frames on offline-to-online interaction of outdoor advertising. *Journal of Retailing and Consumer Services*, *58*, 102282- 102294. https://doi.org/10.1016/j.jretconser.2020.102282

Yastini, N. P. Y. A., & Nuriawan, I. N. A. (2023). The Impact of Tourists' Misbehavior on the Tourism Economy in Bali: A Case Study and Economic Analysis. *Samā Jiva Jnānam (International Journal of Social Studies)*, *1*(2), 14-27.

Zeng, E., Kohno, T., & Roesner, F. (2021). What makes a "bad" ad? user perceptions of problematic online advertising. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*, *35*, 1-24. https://doi.org/10.1145/3411764.3445459

Article history: Received: 17.02.2025 Revised: 04.06.2025 Accepted: 26.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XVIII, vol. 60, no. 2spl, 2025, p.1388-1398
DOI 10.30892/gtg.602spl34-1510

SMART PUBLIC SPACES AND ELDERLY CARE: THE ROLE OF DIGITAL TECHNOLOGIES IN ENHANCING QUALITY OF LIFE IN CHINA

Tiantian YU [1, 2], **Roosli RUHIZAL** [1*], **Ahmad HAKIMI** [1], **Dawei DONG** [3]

[1] Universiti Sains Malaysia, School of Housing, Building Aand Planning, Penang, Malaysia; yutiantian@student.usm.my (T.Y.); ruhizal@usm.my (R.R.); Kimi@usm.my (A.H.)
[2] Wenzhou Polytechnic, School of Civil Engineering and Architecture, Zhanjiang, China; yutiantian@student.usm.my (T.Y.)
[3] Zhejiang Oujiang Construction Co., Ltd, Wenzhou, Zhejiang, China; 276484173@qq.com (D.D.)

Citation: Yu, T., Ruhizal, R., Hakimi, A., & Dong, D. (2025). Smart public spaces and elderly care: The role of digital technologies in enhancing quality of life in China. *Geojournal of Tourism and Geosites*, 60(2spl), 1388–1398. https://doi.org/10.30892/gtg.602spl34-1510

Abstract: As urban areas globally integrate smart public spaces, the elderly population's interaction with these technological environments is increasingly important. This study aims to investigate how smart public space design affects the quality of life of elderly individuals in urban China. Furthermore, it explores digital literacy as a mediator in this relationship, hypothesizing that the elderly's ability to navigate digital technology influences the extent to which they benefit from such spaces. A quantitative, cross-sectional research design was utilized to collect data from 134 elderly individuals (aged 60 and above) living in urban areas of China. A structured survey, based on validated measurement scales from past research, assessed smart public space design, digital literacy, and quality of life. SmartPLS 4.0 was used for data analysis, employing partial least squares structural equation modeling (PLS-SEM) to examine the direct and mediated relationships between the constructs. The findings reveal that smart public space design significantly enhances the quality of life of elderly individuals. Additionally, digital literacy plays a significant mediating role, emphasizing that elderly individuals with higher digital literacy are better equipped to leverage smart technologies in urban spaces. These findings contribute to the growing body of knowledge on age-friendly smart city development and underline the necessity for inclusive design principles. The results also imply that even the most advanced urban infrastructure cannot reach its full potential unless users, particularly the elderly, are equipped with the skills to interact with it effectively. Therefore, improving digital literacy among older adults is not just beneficial but essential in maximizing the impact of smart public environments. Practical implications include the integration of digital education initiatives within smart urban planning frameworks. This dual approach technological enhancement combined with human capacity development - ensures that the elderly population is not left behind in the rapidly evolving digital landscape of urban China. The study recommends policy interventions aimed at bridging the digital divide and promoting social inclusion. Future research may explore longitudinal impacts of digital literacy interventions on elderly wellbeing in smart cities.

Keywords: smart public space design, elderly quality of life, digital literacy, smart city infrastructure, urban aging

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INTRODUCTION

The fast pace of urbanization coupled with the development of digital technology has been a crucial factor in urban space planning and infrastructure. Urban infrastructure in contemporary times is becoming increasingly reliant on smart technologies in attempting to achieve greater accessibility, efficiency, and usability (Hui et al., 2023). In the majority of demographic populations, the older participant will be experiencing distinguishing barriers in accessing the city space in the form of mobility impairment, impairment in cognitive ability, and reduced social contact (Wang et al., 2025). With these barriers, the notion of Smart Public Spaces (SPS) has been being interpreted to take on greater importance, e.g., intelligent seats, green spaces, accessibility upgrade, and sensor-based navigation systems to enhance inclusiveness and quality of life of the older (Carnemolla et al., 2024). Such smart public space technologies are likely to improve autonomy, improve mental well-being, and improve mobility of the older (Ji et al., 2025). Despite such technological advancements, the usability of smart public spaces to enhance the quality of life of the elderly depends on their ability to learn and accommodate digital infrastructure, and thus there is a need for the inclusion of digital literacy as a mediator (Hui et al., 2023). In the absence of digital literacy, the elderly would neither be able to utilize digital kiosks, mobile applications, and navigation systems integrated in intelligent public spaces, and thereby leading to unequal access and usage (Arias Lopez et al., 2023). With greater reliance on technology-driven urban infrastructure, it is therefore crucial to understand how digital literacy acts as a mediator between intelligent public space planning and the quality of life among the elderly to facilitate the elderly to access these technologies to the optimum (Ciampa et al., 2023). More research has explored the impact of smart public spaces on older adults' mobility and well-being (Agboola & Tunay, 2023). Research has all indicated that sensor-based wayfinding smart public spaces have a significant impact on wayfinding by

* Corresponding author

older adults, reducing stress and maximizing independence (Alataş & Arslan, 2023). Smart sitting spaces with climate, ergonomic support, and interactivity have also been found to increase relaxation and social interaction in older adults, resulting in general well-being (Arias Lopez et al., 2023). Green spaces in smart public spaces have also been associated with reduced stress, increased cognitive capacity, and increased physical activity in the elderly (Sugianto et al., 2024). Accessibility enhancement features such as digital kiosks, real-time transit information, and automated crossing have also been discovered to increase mobility and accessibility in the urban environment (Cugurullo et al., 2023).

Despite the research showing the advantage of smart public spaces on the quality of life of older people, it also shows that effective utilization of the resources is dependent on digital literacy (Ervianti et al., 2023). It has been proven through research that very digitally literate older people have a greater likelihood of utilizing smart public infrastructure, increasing mobility, social interaction, and psychological well-being (Farias-Gaytan et al., 2023). On the contrary, the individuals who are bounded in digital skills will become frustrated and isolated and will pose accessibility and independent living barriers (Marín & Castañeda, 2023). This emphasizes the necessity of considering digital literacy as an intervening variable in the smart public spaces and older adults' quality of life relationship.

Despite extensive literature on smart public spaces and the well-being of older citizens, there remain some gaps which need to be filled. To begin with, most of the studies have researched physical accessibility and environmental factors with no reference made to digital literacy in accessing smart public infrastructure (Nguyen & Habók, 2024). While some of the studies have made recommendations in terms of benefits of sensor-based navigation and digital kiosks, very few studies have conducted research on digital literacy needs that are needed in the efficient application of them (Novitasari et al., 2023). Second, existing studies have the general inclination towards researching general opinion in urban planning without reference being made to specific issues of older citizens with varied levels of digital literacy (Reddy et al., 2023). Most studies assume the premise that technological advancement naturally brings about inclusivity with no consideration of the digital divide between older individuals and limited exposure to technology (Yu, 2025). Third, while there are a few studies that have explored the direct impact of smart public spaces on the health of older individuals, there are limited studies that have examined the mediating role of digital literacy on the relationship directly (Yazdanmanesh et al., 2023). In the background of increasing reliance on digital infrastructure in cities, it is imperative to fill these gaps by exploring the impact of digital literacy on the extent to which older individuals can gain from smart public spaces (Al-Barakat et al., 2025).

The purpose of the present research is to examine how smart public space design affects elderly people's quality of life with a focus on the mediating effect of digital literacy. Through analyzing the different elements of smart public spaces, including smart seating, green spaces, accessibility features, and sensor-based navigation, this study aims to learn how these innovations in technology help in the improvement of the well-being and independence of older people. The research also seeks to investigate how digital literacy, the capacity to use and navigate these intelligent systems effectively, mediates the relationship between smart public space design and older people's quality of life. Since older adults have potential barriers to access digital technologies based on different levels of digital literacy, this study will shed light on the extent to which these barriers can affect the efficiency of smart public spaces in enhancing the lives of senior citizens (Chamboko-Mpotaringa et al., 2023). Finally, the research will provide suggestions for policymakers and urban planners regarding the design of inclusive and accessible public spaces that maximize the benefits of smart technologies to elderly groups while also enhancing the digital literacy of older people. By addressing these questions, the study seeks to provide a comprehensive understanding of how technological advancements in urban design intersect with digital literacy to shape elderly quality of life.

The implications of the study are significant to gerontologists, urban planners, and policymakers. By determining the mediating role of digital literacy in affecting the relationship between smart public space and the well-being of the elderly, the study will inform urban design standards towards ensuring maximum accessibility and inclusivity (Basnet et al., 2024). The study will offer prescriptive advice to enhance digital literacy for older persons so that they can maximize the usage of smart city spaces (Charoenkiatkan et al., 2024). Since the globe is shifting toward digital cities, researching the dynamics between older persons and smart infrastructure can help deliver age-friendly cities for enhancing independence, mobility, and well-being (Kim & Oh, 2024). Theoretical models used in this research are based on Technology Acceptance Model (TAM) and Ecological Systems Theory (EST). Perceived ease of use and perceived use are determinants of technology acceptance and use based on TAM arguments (Davis et al., 1989). Digital literacy in this research is a determinant of ease of use and usefulness in accessing smart public spaces and, therefore, the extent to which they achieve quality of life (Reddy et al., 2023). EST, on the contrary, accounts for the way the environment—urban infrastructure and technological facilities—interacts with the person characteristics and the way the interaction influences well-being (Cao et al., 2025). From these two, smart public spaces constitute a microsystem influencing the mobility and social interaction of older adults, and digital literacy is the personal resource that is an interaction mediator (Addas, 2023). Based on the integration of these theories, the research will attempt to construct an integrative model of the combined influence of digital literacy and smart city planning on older adults' well-being. Last, the research will be capable of informing evidence-based intervention design to improve the accessibility and usability of smart public spaces among older adults (Kabir et al., 2023).

LITERATURE REVIEW

In the past few years, the use of digital technologies in urban public spaces has been the prime driving force for enhancing the quality of life among older adults. As cities turn smart, digital interventions in the form of IoT-based infrastructure, AI-based health monitoring, and smart mobility solutions have effectively enhanced accessibility, security, and social inclusion among older adults (Mortaheb & Jankowski, 2023). Empirical evidence supported that AI-based embedded sensor networks and analytics-embedded smart public spaces facilitate timely monitoring of older adults, ensuring timely medical response and security alerts (Štěpánek, 2023). For example, IoT-based fall detection and AI-based predictive analytics ensure foresight regarding the probable risks to health, thereby preventing hospitalization and overall well-being (Agboola & Tunay, 2023). Additionally, age-friendly smart digital infrastructure for urban planning such as smart lighting, voice-assisted, and auto-navigated systems has assisted in preventing mobility limitations and enhancing independent living (Salazar-Miranda et al., 2023). Mobile apps and digital kiosks with old-age-friendliness further enhance older adults' public place mobility, access to basic facilities, and social activity, reducing social isolation and enhancing better social participation (Hui et al., 2023). Besides physical infrastructure, application of digital platforms and virtual interaction technologies has transformed elder care with remote healthcare, cognitive stimulation, and intergenerational bridging (Goar et al., 2023; Hui et al., 2023). Telemedicine services aided by AI chatbots and wearable health-tracking devices have made it easier for older individuals to access medical consultation across geographical spaces, thereby enhancing health access and care continuity (Arias Lopez et al., 2023). Moreover, intelligent public spaces increasingly integrate virtual reality (VR) and augmented reality (AR) experiences intended for cognitive training, memory, and entertainment, promoting mental health and preventing risk of neurodegenerative disease (Basnet et al., 2024).

The promise of digital literacy programs, even more specifically aimed at preparing older individuals for technology adoption, is also well established in the current literature (Nguyen & Habók, 2024). Governments and planners increasingly appreciate the hidden function of policy frameworks embracing digital equity to ensure that older individuals are not left behind when the public space is digitalized (Novitasari et al., 2023). Through creation of a technologically inclusive space, intelligent public spaces are not only offering physical and psychological comfort but also active aging and lifelong learning, thereby making urban space more sustainable and age-friendly in the long term (Liang et al., 2024).

Smart public space design and quality of life of elderly

In recent years, the integration of digital technologies in public spaces has been at the forefront to enhance the well-being of aging communities, especially in urban areas (Carnemolla et al., 2024; Ervianti et al., 2023). Some of the key elements of smart public spaces include intelligent seating, green spaces, enhanced accessibility, and sensor-activated navigation (Yazdanmanesh et al., 2023). All the studies conducted so far have consistently shown that these attributes have the power to significantly impact old age welfare, both physical and mental (Cavada, 2023; Mortaheb & Jankowski, 2023). Greenspaces, for instance, have long been shown to be critical in reducing stress, improving cognitive ability, and promoting physical activity, particularly in the elderly (Hui et al., 2023; Salazar-Miranda et al., 2023). Similarly, the inclusion of smart seating and accessibility features such as ergonomic benches, automated temperature-controlled seating, and voice-directed information systems has been found to improve comfort and reduce physical discomfort for elderly individuals, with a resulting perception of control and well-being (Addas, 2023; Agboola & Tunay, 2023). Sensor-based navigation, another of the major features, enhances mobility by offering real-time assistance to the elderly, guiding them within public spaces and alerting them to potential obstacles or threats (Shiu, 2024). Such technologies are not only designed to enhance physical well-being but also to alleviate psychological pressure, allowing elderly individuals to move around in city spaces independently (Spicer et al., 2023). However, since the potential effectiveness of these intelligent interventions is so high, existing research focuses on very narrow geographic areas or small populations, limiting the generalizability of their findings (Cugurullo et al., 2023; Sugianto et al., 2024).

Empirical work on smart public spaces reveals highly valuable insights but also a number of limitations. For instance, research on green spaces has evidenced positive impacts on the health of the elderly, with elderly populations in urban communities reporting lower depression and anxiety levels when they regularly interact with nature (Kabir et al., 2023). These studies rarely consider the influence of technological attributes, including sensor-based navigation or intelligent seating, which are inherent to the concept of smart public spaces. Equally, studies on accessibility technologies, including digital wayfinding systems, have stressed enhancements in elderly mobility but did not extensively consider the socio-economic gaps that could influence how elderly people engage with these technologies (Goar et al., 2023). Another glaring omission in literature is that of digital literacy and how older adults, especially those without much technological competence, would be incapacitated from harnessing these advancements (Marín & Castañeda, 2023; Shiu, 2024). In addition, whereas research such as that by (Reddy et al., 2023; Salazar-Miranda et al., 2023) centers on smart mobility solutions, they tend to ignore the wider ramifications of deploying such technologies in socio-economically mixed urban settings, where technology access is constrained. Therefore, it is crucial that future research explore the intersection of digital equity, accessibility, and user-friendliness, ensuring that all elderly individuals, regardless of their technological literacy or socio-economic status, can fully benefit from smart public spaces.

H1: Smart public space design has a significant impact on quality of life of elderly

Digital literacy as mediator

The increasing body of empirical evidence underscores the important contribution that smart public spaces make to the quality of life of older adults (Alataş & Arslan, 2023). Some of the critical components like smart seating, green spaces, accessibility elements, and sensor-based wayfinding have been found to enhance mobility, social interaction, and overall health (Arias Lopez et al., 2023). For instance, smart seating systems with ergonomic features and IoT sensors can be designed to become more comfortable and safer by adapting to the body needs of the user and notifying them of potential risks, which significantly reduces the risk of falls and discomfort (Ervianti et al., 2023). Similarly, the presence of green spaces within cities has been linked to various health advantages including decreased stress, improved cognitive functioning, and increased physical activity, all leading to improved quality of life among elderly individuals (Reddy et al., 2023). It has also been shown by research that accessibility enhancements, including voice-controlled systems and electronic kiosks, allow older people to move around public areas with greater confidence, lessening the social participation barriers and promoting a feeling of independence (Farias-Gaytan et al., 2023). Furthermore, sensor-based navigation systems that provide real-time route instructions and emergency calls have been known to decrease fear of getting lost, promote autonomy, and lower anxiety levels in the elderly (Carnemolla et al., 2024). Despite the positive results, other research also shows the limitation of the interventions, notably in terms of digital literacy (Yu, 2025). Major groups of older adults, especially from rural and low-income communities, are not provided with the access to utilize such advanced technologies, which can reduce their ability to efficiently use smart public spaces (Charoenkiatkan et al., 2024). This emphasizes the importance of special digital literacy interventions that provide older individuals with the competencies to communicate appropriately with smart city infrastructure.

Based on these findings, the mediating function of digital literacy in the relationship between smart public space design and the quality of life of the elderly becomes more apparent. Digital literacy is a critical element in the provision that older adults can effectively use the imbedded technologies in smart public spaces (Lee & Moon, 2023). There is evidence that greater digital literacy among older adults results in increased uptake of technologies such as sensor-based navigation, smart seating, and mobile applications designed to enhance accessibility and social interaction (Basnet et al., 2024). By increasing their ability to navigate and utilize these digital technologies, older persons can potentially live more independently and be more social, which helps generate improved physical and psychological health (Yu, 2025). The majority of older adults, particularly those with limited educational levels or who come from rural origins, will be limited in their capabilities regarding the utilization of such technology (Nguyen & Habók, 2024), minimizing how much they can actually make use of the elements of smart public space features (Nguyen & Habók, 2024). This shortage of digital literacy entails higher degrees of intervention in the way of digital literacy education for groups of the older generation (Charoenkiatkan et al., 2024; Lee & Moon, 2023). Evidence shows that enhancing digital literacy among older people strengthens not just their ability to engage in public spaces but also has various broader effects on their social integration and well-being (Hui et al., 2023). With the increasing application of digital technology in urban areas, closing the digital literacy gap becomes essential to empower all older individuals to benefit from the advancements of smart public space innovation.

H2: Digital literacy among elderly mediates the relationship between smart public space design and quality of life of elderly

Theoretical foundation for the analysis of the relationship between smart public space planning, digital literacy, and quality of life in old age is based on the Technology Acceptance Model (TAM) and Ecological Systems Theory (EST). TAM, as proposed by (Davis et al., 1989), posits that the usage and acceptance of technology by an individual are determined by perceived ease of use and perceived usefulness (Charoenkiatkan et al., 2024).

In the research context, smart public space design, for instance, smart seating, green areas, accessibility, and navigation through sensors, is high-tech urban infrastructure that improves the quality of life of older individuals. But how much the smart aspects are being used to optimal capacity relies on digital literacy, as dictated by TAM's principle that technology use is mediated by user competence and perceived ease of interaction (Basnet et al., 2024). Digital literacy is an intervening variable by facilitating elderly people in mobilization, access, and benefits realization from smart public spaces to maximize their well-being (Arias Lopez et al., 2023). Furthermore, Ecological Systems Theory (Chong et al., 2023) provides a broad framework by focusing on how environmental stimuli, including physical and technology systems, interact with individual characteristics in influencing development and well-being. The theory asserts that the quality of life of an individual is a function of interacting with the near environment (microsystem) and broader societal institutions (macrosystem), for example, city planning and digital equity policies (Shiu, 2024).

Smart public space as part of physical infrastructure is part of the microsystem, and digital literacy is one of the most fundamental individual-level factors explaining the level of usage of these spaces. When older adults possess required levels of digital literacy, they better fit into sensor-based wayfinding, smart seating adjustments, and accessibility features, and they enjoy greater mobility, autonomy, and social inclusion (Yu, 2025). Without digital literacy, older adults fail to enjoy the technological innovation, thus sustaining accessibility inequalities in cities and internet use (Kabir et al., 2023). Applying TAM's technology adoption model and EST's environmental determinisms (Figure 1), this model accurately explains smart public space designs' impacts on older adults' quality of life and how digital literacy serves as a critical transitional factor in mediating this advantage.

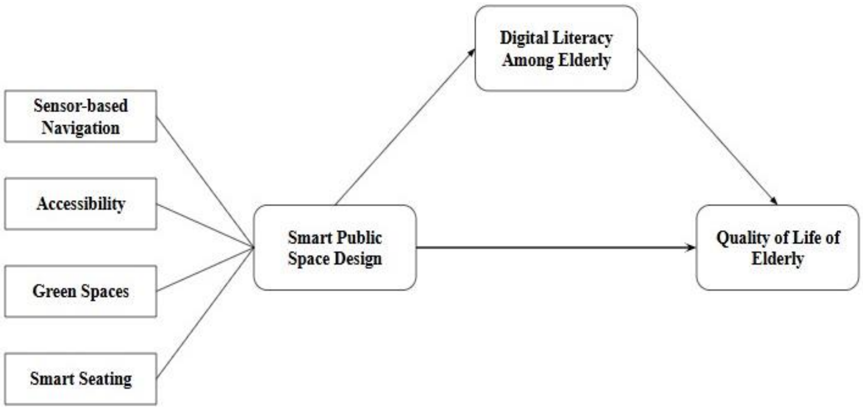

Figure 1. Conceptual framework

METHODOLOGY

This study used a quantitative, cross-sectional design to investigate the impact of smart public space design on the quality of life of older adults in urban China, mediated by digital literacy. With the growing use of smart urban infrastructure, this study sought to establish the impact of technological innovations in public spaces - e.g., smart seating, green spaces, accessibility, and sensor-based navigation - on the health of older adults. This study targeted older adults aged 60 and above living in Chinese urban cities where smart public spaces are becoming an increasingly integral part of lives. 134 respondents were interviewed, and data were collected in public parks, community centers, and transport hubs where smart technology is extensively used. Convenience sampling was applied owing to the availability of older adults in digitally augmented public spaces. The survey instrument used validated measures from the literature to guarantee the reliability of measurements. Constructs were assessed with multiple items per dimension, and ratings were made on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The independent variable, intelligent public space design, was operationalized on four dimensions: intelligent seating, green space, accessibility, and sensor-integrated wayfinding. The four dimensions were all measured using three indicators to measure users' feelings of comfort, usability, and accessibility. The dependent variable, quality of life, was gauged by six items capturing physical well-being, emotional happiness, and social interaction. The mediator, digital literacy, included seven items that captured the capacity of the elderly population to make use of technology, interact with intelligent infrastructure, and utilize digital platforms in city spaces.

To ensure ease of response and understandability, the survey was administered electronically and in hard copy, to suit participants with varying levels of comfort with digital media. Data collectors offered assistance in interpreting survey items where necessary, to reduce the likelihood of misinterpretation or non-response bias. Data collection was from among older adults who actively use smart public spaces, to ensure that responses reflected real experience with digital infrastructure. SmartPLS 4.0 was used to analyze data and test the measurement and structural models. Construct reliability and validity were initially tested using Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE). Discriminant validity was tested using the heterotrait-monotrait (HTMT) criterion to confirm that the constructs were sufficiently different. Structural model analysis tested direct and mediated relationships using path coefficients, t-values, p-values, and R^2 values, to verify the statistical significance of the hypotheses. The methodological approach provided robust insights into how smart public space design enhances elderly well-being, both directly and through digital literacy. The integration of validated measurement scales, a structured sampling process, and advanced statistical techniques ensured a rigorous and reliable analysis of the research problem. By focusing on urban China's smart city initiatives, this study contributes to a deeper understanding of the role of digital infrastructure in supporting aging populations.

RESULTS

Table 1 establishes construct validity and reliability of Smart Public Space Design (SPSD), Quality of Life (QOL), and Digital Literacy (DL) with satisfactory convergent validity and internal consistency. Cronbach's Alpha values for all the constructs are greater than the suggested 0.7 value, indicating high reliability, while SPSD = 0.933, QOL = 0.898, and DL = 0.891.

Table 1. Construct reliability and validity

Construct	Items	Outer Loading	Cronbach's Alpha	CR	AVE
Smart Public Space Design	SPSD1	0.479	0.933	0.942	0.527
	SPSD2	0.828			
	SPSD3	0.714			
	SPSD4	0.801			
	SPSD5	0.514			
	SPSD6	0.763			
	SPSD7	0.836			
	SPSD8	0.609			
	SPSD9	0.613			
	SPSD10	0.617			
	SPSD11	0.734			
	SPSD12	0.777			
	SPSD13	0.851			
	SPSD14	0.804			
	SPSD15	0.802			
Quality of Life	QOL1	0.851	0.898	0.922	0.664
	QOL2	0.804			
	QOL3	0.802			
	QOL4	0.820			
	QOL5	0.876			
	QOL6	0.877			
Digital Literacy	DL1	0.837	0.891	0.914	0.605
	DL2	0.730			
	DL3	0.737			
	DL4	0.755			
	DL5	0.677			
	DL6	0.712			
	DL7	0.809			

Composite reliability (CR) values also indicate the high reliability of constructs with all of them greater than the suggested value of 0.7, with SPSD = 0.942, QOL = 0.922, and DL = 0.914. Average Variance Extracted (AVE) values for all the constructs are greater than the 0.5 mark, with SPSD being 0.527, QOL being 0.664, and DL being 0.605, with adequate convergent validity. Since all the AVE values are above 0.5, outer loadings greater than 0.4 but less than 0.7 are also acceptable and make the construct valid. In SPSD, even though some items such as SPSD1 (0.479), SPSD5 (0.514), SPSD8 (0.609), SPSD9 (0.613), and SPSD10 (0.617) have lower outer loadings, they still fall within the acceptable limit and therefore validate the construct's reliability and validity. Likewise, in Digital Literacy, DL2 (0.730), DL3 (0.737), and DL5 (0.677) fall within the acceptable limit, validating the construct's stability. These findings confirm the measurement model (Figure 2), ensuring that the constructs are well measured and possess the required reliability and validity for further analysis.

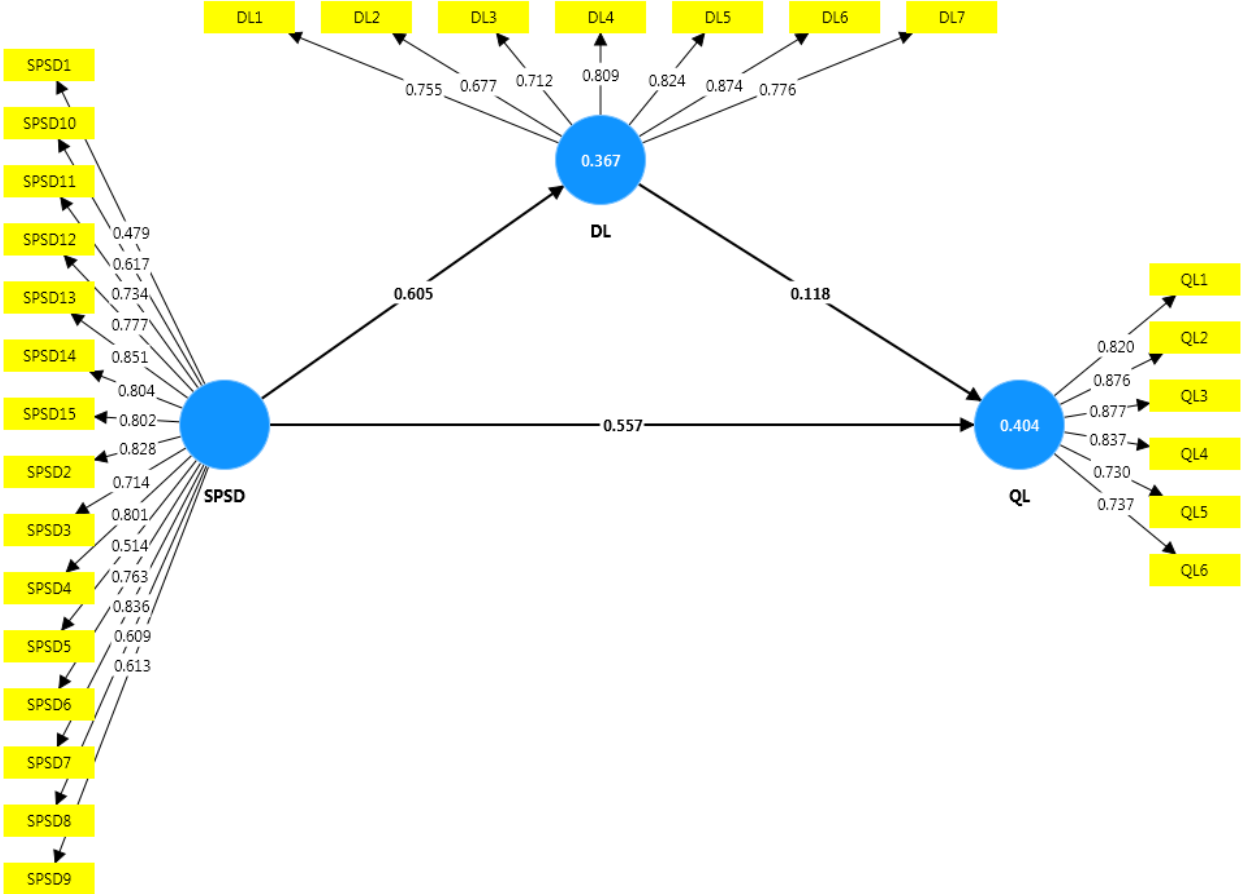

Figure 2. Measurement model

Table 2 assesses discriminant validity through the Heterotrait-Monotrait (HTMT) criterion to guarantee that the constructs are different from each other. HTMT values based on the HTMT benchmark below 0.85 establish good discriminant validity, while values between 0.85 and 0.90 indicate potential problems, and values of 0.90 and above indicate failure of discriminant validity. The HTMT values between constructs in this study are within acceptable range, with SPSD and QOL (0.497), SPSD and DL (0.635), and QOL and DL (0.670) all below the 0.85 threshold. The results validate each construct as measuring a different concept, further supporting the measurement model robustness. The acceptable HTMT values further establish that there is no multicollinearity or over-lap between the constructs, further supporting the theoretical model validity. Table 3 presents evidence regarding the explanatory ability and predictive significance of the structural model. R^2 values provide evidence of the proportion of variance explained by the independent variables in the dependent variables, and Q^2 values provide evidence of predictive relevance using the blindfolding technique.

Table 2. Discriminant validity (HTMT Criterion)

Constructs	SPSD	QL	DL
Smart Public Space Design			
Quality of Life	0.497		
Digital Literacy	0.635	0.670	

Table 3. Coefficient of determination and predictive relevance

Constructs	R2	Q2
Quality of Life	0.404	0.372
Digital Literacy	0.367	0.349

The results show that Smart Public Space Design explains 40.4% variance in Quality of Life ($R^2 = 0.404$), and 36.7% variance in Digital Literacy ($R^2 = 0.367$). The values reflect a moderate explanatory ability of the independent variables. Furthermore, the Q^2 values for Quality of Life (0.372) and Digital Literacy (0.349) are positive, which supports that the model has adequate predictive relevance. Since Q^2 values greater than zero reflect that the model has predictive power, results affirm the ability of the model to predict and explain the constructs well.

Table 4 shows the result of hypothesis H1, testing the direct relationship between Smart Public Space Design and Quality of Life. The path coefficient (β) of 0.557 is a strong positive correlation, showing that improved smart public space design has a strong positive relationship with improved elderly quality of life.

The t-value of 5.475, which is larger than the critical value of 1.96, and the p-value of 0.000, which is smaller than the 0.05 significance level, confirm that this relationship is statistically significant. These findings confirm H1, supporting previous studies that highlight the need for good infrastructure, green spaces, and accessibility features to improve elderly well-being. The strong positive coefficient suggests that urban developers and policymakers must prioritize inclusive and technology-facilitated public spaces in order to enhance elderly well-being.

Table 4. Direct Path Analysis

Hypothesis	Relation	Path Coefficient (β)	t-Value	p-Value
H1	Smart Public Space Design → Quality of Life	0.557	5.475	0.000

Table 5 examines H2, stating that digital literacy mediates the influence of Smart Public Space Design on Quality of Life. The measure records a path coefficient (β) value of 0.269, indicating a statistically significant indirect influence of SPSD on QOL through digital literacy. The t-value of 5.75 is greater than the typical cut-off, and the p-value of 0.000 indicates that mediation effect is statistically significant.

Table 5. Mediation Analysis

Hypothesis	Relation	Path Coefficient (β)	t-Value	p-Value
H2	Smart Public Space Design → Digital Literacy → Quality of Life	0.269	5.75	0.000

The above finding supports H2 and indicates that more digitally literate older individuals take the most advantage of the benefits provided by smart public spaces, resulting in an equivalent improvement in the quality of life. This has serious implications and emphasizes the importance of digital training programs as well as end-user-friendly technical interfaces to enable older individuals to make effective use of smart public spaces. The statistically significant mediation effect supports the contention that technological adoption is not infrastructure-dependent but also user-capability-dependent and therefore promotes efforts to enhance older individuals' digital literacy, as shown in Figure 3.

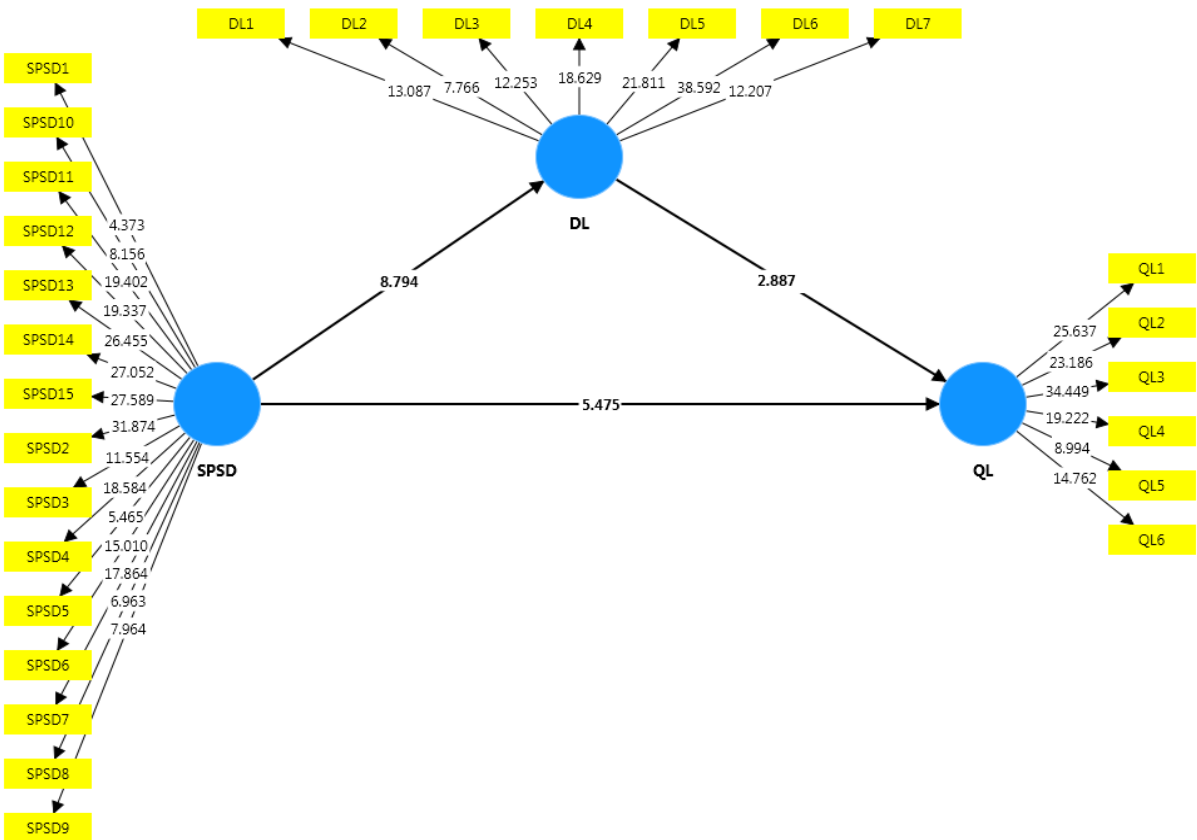

Figure 3. Structural Model

DISCUSSION

The fast pace of smart technology development has revolutionized urban areas, defining a new paradigm of public space design focused on inclusivity, accessibility, and improved quality of life (Zhao et al., 2024). With aging populations in societies across the globe, the contribution of smart public spaces to the mobility, autonomy, and social interaction of the elderly has been under the limelight. This study adds to this debate by empirically investigating the contribution of smart public space design, including smart seating, green space, accessibility, and sensor-aided navigation, to the quality of life of elderly citizens (Agboola & Tunay, 2023). It also investigates the mediating influence of digital literacy, the realization that technologically enhanced space is full of promise but whose potential is still subject to the ability of elderly users to access and use it. The findings affirm the contribution of good public space design to the well-being of the elderly but note that the association is exponentially increased when elderly citizens have the digital competencies to optimize the use of smart infrastructure (Spicer et al., 2023). By combining urban planning, gerontology, and technology adoption theory, this study gives a comprehensive explanation of how smart urban infrastructure can be leveraged to improve the lived experience of the elderly. The discussion below critically interprets these findings and places them within the existing academic literature while explaining their implications for policymakers, urban planners, and technology developers.

The findings of this study affirm that intelligent public space planning, smart seating, green areas, accessibility, and sensor-based way finding immensely improves the well-being of older people. This agrees with current research that has established that smart technologies in well-designed cities enhance mobility, social contact, and health of elderly individuals (Hui et al., 2023). Implementation of sensor-based way finding system has been successful in enhancing wayfinding, stress relief, and independent mobility among elderly, a stepping point to independence and well-being (Kabir et al., 2023). Installation of smart seating systems by means of ergonomic adjustment, climatic control, and interactive communication capability has worked to enhance comfort and ease of social contact, enhance emotional well-being and sense of belonging (Lim et al., 2024). Green space integration within smart public space design has proven to be effective in alleviating psychological distress, enhancing cognitive function, and calming the mind, in agreement with previous research that has proved the therapeutic use of urban green space among older adults (Mortaheb & Jankowski, 2023). The results of the study are also consistent with the reality that enhanced accessibility features such as automatic pedestrian signals, digital signs, and real-time transit information enhance the independence of elderly people, thus making them have easy and confident access to public space (Reddy et al., 2023). Total results are therefore in line with the hypothesis that sophisticated public space design is a crucial determinant of quality of life for older individuals via enhanced mobility, inclusivity, and psychological comfort.

The findings in this research further contribute more proof to the premise that digital competence is an essential mediator of smart public space design effect on well-being among old adults. The research also adds more proof that innovation of urban infrastructure using technology is not the worth if individuals do not have the proper abilities to gain ultimate utilization from technological innovations. This is consistent with current research evidence indicating that digitally literate older people are better placed to be able to make use of sensor-based navigation, touch-screen kiosks, and real-time public transport information to maximum benefit, and therefore maximize maximum autonomy and overall well-being (Ervianti et al., 2023). The findings draw attention to the point that elderly individuals with proper digital skills encounter fewer barriers of access, and hence are optimally placed to gain maximum value from smart sitting spaces, touch-screen health monitoring kiosks, and other digital services within the public environment (Yazdanmanesh et al., 2023). In addition, digitally highly literate people also possess higher self-efficacy and the propensity to actively use smart urban spaces to optimal advantage, thereby resulting in optimal mobility, more social relations, and more psychological well-being (Basnet et al., 2024). On the other hand, however, this research also validates the reality that older individuals with poor digital literacy are likely to be left behind in the benefits of smart public spaces because of the risk of struggle or intimidation in using sensor-based navigation, touch-screen kiosks, and other digital technology (Kim & Oh, 2024). These results empirically add evidence to the hypothesis that digital literacy is a strong predictor of the level to which older persons can utilize and benefit from smart public places.

The findings of this study highlight the significance of a multi-dimensional approach to elderly-friendly urban planning, where physical infrastructure and digital empowerment go hand in hand. The acceptance of H1 suggests that smart public space planning has a direct influence on the well-being of older adults, reiterating the significance of age-inclusive design features such as smart seating, green spaces, and sensor-based way finding. The acceptance of H2 also reiterates that digital literacy is the key facilitator in realizing the full potential of smart public spaces, reiterating that infrastructure is crucial but not enough without attempts to overcome the digital divide among elderly groups. The implications of these findings have far-reaching implications for urban development policy, suggesting that future smart cities must incorporate not only technological innovation but also digital training programs and accessible interfaces to ensure equal access. With urban sprawl continuing, the integration of smart public spaces with digital literacy programs will be essential in creating an inclusive environment where older adults can live with dignity, autonomy, and enhanced well-being. This study, therefore, presents a starting point in redefining smart urban spaces as dynamic ecosystems empowering aging groups through physical and digital accessibility, paving the way for future research and policy innovation in this critical field.

Implications

This work contributes important theoretical insights by synthesizing urban planning, gerontology, and technology adoption theory to analyze the effects of smart public space design on older people's quality of life with the mediating variable of digital literacy. This work extends the Environmental Press Theory (Hui et al., 2023) by demonstrating that smart public spaces, in terms of attributes such as intelligent benches, green areas, accessibility enhancement, and navigation using sensors, are able to shape the built environment in such a way that it modulates environmental demands and encourages the well-being of older people. The study also extends Technology Acceptance Models (Charoenkiatkan et al., 2024) by proving that digital literacy is the prime facilitator in the maximization of smart urban infrastructure benefits, proving the perceived ease of use and usefulness of technology to be the sine qua non determinants for older people to participate in intelligent environments.

Finally, this work supports Active Aging Theory (Agboola & Tunay, 2023) by proving that public space design as well as digital empowerment increases mobility, social contacts, and life satisfaction among older individuals. The study also extends Smart City and Inclusive Design Theories (Shiu, 2024) by empirically proving that digital inclusion is the bottom-line driver that makes the smart city an age-friendly city, proving that it is not only the establishment of technologically advanced spaces that needs to be prioritized by urban planners but also facilitating the use of such facilities by older people. Through the identification of a causal link between physical space, digital know-how, and well-being outcome, this research extends interdisciplinary theories that integrate the domains of urban planning, human-computer interaction, and gerontology, thereby ultimately offering an equitable understanding of the potential of the use of smart technologies to create an inclusive, sustainable, and age-friendly city.

The findings of this research offer important practical implications for urban planners, policymakers, technology developers, and eldercare service providers to enhance the quality of life of aging populations through smart public spaces.

First, the research highlights the importance of municipal governments and urban planners giving high priority to age-friendly smart public space design, with the promise that such facilities as smart seating, green spaces, improved accessibility, and sensor-based wayfinding are well integrated into cityscapes to support elderly mobility, comfort, and social interaction.

Second, in consideration of the mediating effect of digital literacy, governments and local community organizations need to introduce targeted digital literacy training programs to enable elderly individuals with skills to effectively use and navigate smart public infrastructure. Public-private partnerships can play a crucial role in developing user-friendly digital interfaces and assistive technologies specifically tailored for elderly users, with the promise that they can navigate smart navigation systems, digital kiosks, and other urban digital solutions with confidence.

Third, healthcare and social service providers need to leverage smart public spaces to enhance telehealth access, emergency response systems, and AI-based health monitoring tools to enhance elderly safety and well-being in outdoor spaces. Technology companies need to design intuitive, accessible digital tools to support older adults, such as voice commands, simplified touch interfaces, and AI-powered assistance to support usability.

Finally, policy interventions need to ensure that smart city projects are inclusive and equitable, particularly in bridging the digital divide among elderly individuals of different socioeconomic backgrounds. By facilitating cross-sector collaboration, cities can effectively develop age-friendly smart spaces that are not only physically accessible but also empower older adults with the digital competence to fully participate in urban living, thus contributing to a more sustainable, inclusive, and technology-enabled aging society.

Limitations and future directions

Although it has been of productive benefit, this study has certain limitations that must be taken into account. Firstly, the study used a cross-sectional design, which prevents causal inferences between smart public space design, digital literacy, and quality of life from being drawn. Future research may use longitudinal or experimental designs to consider in more detail how enhancements in smart urban infrastructure and levels of digital literacy affect elderly well-being across time. Secondly, the study relied mainly on self-reported measures, which are potentially susceptible to social desirability bias or recall error. Using objective measures—e.g., monitoring digital activity, mobility behavior, or physiological measures of health—may provide more comprehensive and persuasive evidence of how elderly individuals utilize smart public spaces. Thirdly, the study is geographically limited within China, and results may not be entirely generalizable to other cultural or urban contexts where smart city development, levels of digital literacy, and elderly care policy may vary significantly. Future research may use comparative analyses between countries or urban-rural areas to identify how contextual factors affect the effectiveness of smart public spaces in enhancing elderly quality of life.

Besides, this study is primarily focused on physical and virtual dimensions of accessibility in smart public spaces but not on psychosocial or behavioral determinants that can influence elderly technology interaction. Future studies will need to examine cognitive processes, technological resistance, and psychological adaptation comfort levels in utilizing smart urban infrastructure. Additionally, although digital literacy is the main mediator as established by this study, social connectedness, perceived value of technology, or technology anxiety are other variables that can further elucidate how elderly can take advantage of smart city policies.

Future studies should also investigate intersectionality dimensions, e.g., gender, socioeconomic status, and medical conditions, to assess how various elderly segments utilize smart public spaces. Lastly, technological advancements, e.g., AI-based urban planning, IoT-based elderly monitoring, and smart assistive technologies, are in rapid development, and hence ongoing studies should assess how innovative digital technologies can further support elderly independence and urban participation. Closing these research gaps and further extending future studies will allow researchers to create more integrated, inclusive, and technology-enabled urban spaces that can best address the needs of the aging population.

CONCLUSION

This research provides a comprehensive examination of how intelligent public space planning, digital literacy, and adoption of urban technologies together shape older adult well-being. Synthesizing evidence from urban planning, gerontology, and technology acceptance theory, the research empirically demonstrates that intelligent public space facilities such as smart seating, green spaces, accessibility upgrades, and sensor-guided wayfinding play a significant role in enhancing older adult well-being. Furthermore, the findings confirm digital literacy as the crucial mediator, affirming that it is not sufficient to plan technologically advanced public spaces unless older adults also have the associated digital competences to effectively make use of them. The findings have important theoretical and practical implications, challenging urban planners, policymakers, and technology developers to adopt an inclusive, human-centered approach in planning smart cities that are not only physically accessible but also digitally accessible.

Though it makes important contributions, the research identifies limitations such as cross-sectional design limitations, the use of self-reported measures, and geographical coverage, suggesting potential directions for future research in longitudinal assessments, objective behavioral monitoring, and cross-cultural comparisons.

With the world becoming increasingly urbanized and digitalized, this research underscores the urgent need to link smart technologies with forward-looking elderly care systems, so that aging populations can fully participate in and benefit from the digital revolution of public spaces. By advancing technological empowerment and inclusive urban planning, societies can plan age-friendly smart environments that facilitate mobility, independence, social interaction, and overall life satisfaction of older adults in the digital era.

Author Contributions: Conceptualization, T.Y. and A.H.; methodology, T.Y. and D.D.; software, A.H. and D.D.; validation, R.R. and A.H. and D.D.; formal analysis, T.Y. and R.R.; investigation, A.H. and D.D. and R.R.; data curation, T.Y. and D.D. and R.R. and A.H.; writing - original draft preparation, T.Y. and D.D.; writing - review and editing, T.Y. and R.R. and A.H. and D.D.; visualization, R.R. and D.D.; supervision, R.R.; project administration, R.R. and D.D. All authors have read and agreed to the published version of the manuscript.

Funding: Not applicable.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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

Acknowledgements: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Addas, A. (2023). The importance of urban green spaces in the development of smart cities. *Frontiers in Environmental Science*, *11*. https://doi.org/10.3389/fenvs.2023.1206372

Agboola, O. P., & Tunay, M. (2023). Urban resilience in the digital age: The influence of Information-Communication Technology for sustainability. *Journal of Cleaner Production*, *428*, 139304. https://doi.org/10.1016/j.jclepro.2023.139304

Alataş, H., & Arslan, N. (2023). Sleep, malnutrition, and quality of life in elderly hemodialysis patients: A cross-sectional study. *Médecine Palliative*, *22*(5), 260-268. https://doi.org/10.1016/j.medpal.2023.06.008

Al-Barakat, A. A., Al-Hassan, O. M., Alali, R. M., & Al-Saud, K. M. (2025). The role of e-professional development programs in developing digital technology skills among primary geography teachers. *GeoJournal of Tourism and Geosites*, 59(2), 213–225. https://doi.org/10.30892/gtg.59213-2025

Arias Lopez, M. D. P., Ong, B. A., Borrat Frigola, X., Fernandez, A. L., Hicklent, R. S., Obeles, A. J. T., Rocimo, A. M., & Celi, L. A. (2023). Digital literacy as a new determinant of health: A scoping review. *PLOS Digit Health*, *2*(10), e0000279. https://doi.org/10.1371/journal.pdig.0000279

Basnet, S., Balu, V., Kamei, S., Devi, Y. S., & Sapkota, P. (2024). Effectiveness of selected interventions on quality of life and self-efficacy among elderly. *J Educ Health Promot*, *13*, 214. https://doi.org/10.4103/jehp.jehp_1230_23

Cao, L., Feng, S., Chen, K., Wu, X., & Jia, Y. (2025). An ethical model for smart home-based elder care. *Nursing Ethics*. https://doi.org/10.1177/09697330241312383

Carnemolla, P., Mackinnon, K., Darcy, S., & Almond, B. (2024). Public toilets for accessible and inclusive cities: disability, design and maintenance from the perspective of wheelchair users. *Smart and Sustainable Built Environment*, *ahead-of-print*(ahead-of-print). https://doi.org/10.1108/SASBE-01-2024-0035

Cavada, M. (2023). Evaluate Space after Covid-19: Smart City Strategies for Gamification. *International Journal of Human–Computer Interaction*, *39*(2), 319-330. https://doi.org/10.1080/10447318.2021.2012383

Chamboko-Mpotaringa, M., & Tichaawa, T. M. (2023). Moderating effect of age on the adoption of digital marketing tools and platforms in domestic leisure travel. *GeoJournal of Tourism and Geosites*, 51(4 Supplement), 1636–1644. https://doi.org/10.30892/gtg.514supp.32-2023

Charoenkiatkan, C., Khositditsayanan, N., & Wannupatam, B. (2024). Training curriculum to enhance the quality of life for the elderly. *Journal of Education and Learning (EduLearn)*, *18*(3), 616-623. https://doi.org/10.11591/edulearn.v18i3.21336

Chong, S. W., Isaacs, T., & McKinley, J. (2023). Ecological systems theory and second language research. *Language Teaching*, *56*(3), 333-348.

Ciampa, K., Wolfe, Z. M., & Bronstein, B. (2023). ChatGPT in education: Transforming digital literacy practices. *Journal of Adolescent & Adult Literacy*, *67*(3), 186-195. https://doi.org/10.1002/jaal.1310

Cugurullo, F., Caprotti, F., Cook, M., Karvonen, A., McGuirk, P., & Marvin, S. (2023). The rise of AI urbanism in post-smart cities: A critical commentary on urban artificial intelligence. *Urban Studies*, *61*(6), 1168-1182. https://doi.org/10.1177/00420980231203386

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). Technology acceptance model. *J Manag Sci*, *35*(8), 982-1003. http://dx.doi.org/10.1287/mnsc.35.8.982

Ervianti, E., Sampelolo, R., & Pratama, M. P. (2023). The influence of digital literacy on student learning. *Klasikal : journal of education, language teaching and science*, *5*(2), 358-365. https://doi.org/10.52208/klasikal.v5i2.878

Farias-Gaytan, S., Aguaded, I., & Ramirez-Montoya, M. S. (2023). Digital transformation and digital literacy in the context of complexity within higher education institutions: a systematic literature review. *Humanities and Social Sciences Communications*, *10*(1). https://doi.org/10.1057/s41599-023-01875-9

Goar, V., Sharma, A., Yadav, N. S., Chowdhury, S., & Hu, Y. C. (2023). IoT-based smart mask protection against the waves of COVID-19. *Journal of Ambient Intelligence and Humanized Computing*, *14*(8), 11153-11164. https://doi.org/10.1007/s12652-022-04395-7

Hui, C. X., Dan, G., Alamri, S., & Toghraie, D. (2023). Greening smart cities: An investigation of the integration of urban natural resources and smart city technologies for promoting environmental sustainability. *Sustainable Cities and Society*, *99*, 104985. https://doi.org/10.1016/j.scs.2023.104985

Ji, W., Luo, R., Sun, Y., Yang, M., Liu, Y., Chen, H., Lin, D., Su, Z., Tao, G., & Chen, D. (2025). A Networked Intelligent Elderly Care Model Based on Nursing Robots to Achieve Healthy Aging. *Research*, *8*, 0592.

Kabir, M. H., Al Noman, A., Al Afiq, A., Raju, R. H., Hasan, M. N., & Ahmad. (2023). *Design and Implement IoT-Based Intelligent Manageable Smart Street Lighting Systems for Future Smart City* The 4th International Electronic Conference on Applied Sciences,

Kim, H. K., & Oh, H. S. (2024). Determinants of Quality of Life (QoL) in Female Caregivers in Elderly Care Facilities in Korea. *Behav Sci (Basel)*, *14*(1). https://doi.org/10.3390/bs14010053

Lee, W. S., & Moon, J. (2023). The Impacts of Subjective Health and Life Expenses on Quality of Life for Korean Elderly People. *Sustainability*, *15*(22). https://doi.org/10.3390/su152215868

Liang, X., Wei, H., Mo, H., Yang, G., Wan, L., Dong, H., & He, Y. (2024). Impacts of chronic diseases and multimorbidity on health-related quality of life among community-dwelling elderly individuals in economically developed China: evidence from cross-sectional survey across three urban centers. *Health Qual Life Outcomes*, *22*(1), 91. https://doi.org/10.1186/s12955-024-02309-z

Lim, Y., Edelenbos, J., & Gianoli, A. (2024). What is the impact of smart city development? Empirical evidence from a Smart City Impact Index. *Urban Governance*, *4*(1), 47-55. https://doi.org/10.1016/j.ugj.2023.11.003

Marín, V. I., & Castañeda, L. (2023). Developing Digital Literacy for Teaching and Learning. In *Handbook of Open, Distance and Digital Education* (pp. 1089-1108). https://doi.org/10.1007/978-981-19-2080-6_64

Mortaheb, R., & Jankowski, P. (2023). Smart city re-imagined: City planning and GeoAI in the age of big data. *Journal of Urban Management*, *12*(1), 4-15. https://doi.org/10.1016/j.jum.2022.08.001

Nguyen, L. A. T., & Habók, A. (2024). Tools for assessing teacher digital literacy: a review. *Journal of Computers in Education*, *11*(1), 305-346. https://doi.org/10.1007/s40692-022-00257-5

Novitasari, S. I., Natalia, T. L., Pebrianto, T., & Gresella, Y. E. (2023). Digital Literacy Inherency within Narratives Subject at SMP Kristen Palangka Raya. *Journal of Scientific Research, Education, and Technology (JSRET)*, *2*(2), 648-661. https://doi.org/10.58526/jsret.v2i2.138

Reddy, P., Chaudhary, K., & Hussein, S. (2023). A digital literacy model to narrow the digital literacy skills gap. *Heliyon*, *9*(4), e14878. https://doi.org/10.1016/j.heliyon.2023.e14878

Reddy, P., Chaudhary, K., Sharma, B., & Hussein, S. (2023). Essaying the design, development and validation processes of a new digital literacy scale. *Online Information Review*, *47*(2), 371-397. https://doi.org/10.1108/OIR-10-2021-0532

Salazar-Miranda, A., Zhang, F., Sun, M., Leoni, P., Duarte, F., & Ratti, C. (2023). Smart curbs: Measuring street activities in real-time using computer vision. *Landscape and Urban Planning*, *234*, 104715. https://doi.org/10.1016/j.landurbplan.2023.104715

Shiu, S. C. O. (2024). Ageing in a smart city poses concerns on sustainability from a model perspective. *Aging and Health Research*, *4*(1). https://doi.org/10.1016/j.ahr.2023.100179

Spicer, Z., Goodman, N., & Wolfe, D. A. (2023). How 'smart' are smart cities? Resident attitudes towards smart city design. *Cities*, *141*, 104442. https://doi.org/10.1016/j.cities.2023.104442

Štěpánek, P. (2023). *The Challenges and Barriers for Smart City Investments in the Czech Republic*. Smart City Symposium Prague (SCSP),

Sugianto, N., Tjondronegoro, D., Stockdale, R., & Yuwono, E. I. (2024). Privacy-preserving AI-enabled video surveillance for social distancing: responsible design and deployment for public spaces. *Information Technology & People*, *37*(2), 998-1022. https://doi.org/10.1108/ITP-07-2020-0534

Wang, K., Yang, C., Ren, W., & Wang, Z. (2025). Design of elderly rehabilitation service system based on intelligent sensing and thermal energy circulation. *Thermal Science and Engineering Progress*, 103375.

Yazdanmanesh, M., Esmaeili, R., Nasiri, M., & Vasli, P. (2023). Relieving care burden and promoting health-related quality of life for family caregivers of elderly people with Alzheimer's disease via an empowerment program. *Aging Clin Exp Res*, *35*(1), 73-83. https://doi.org/10.1007/s40520-022-02277-8

Yu, Y. (2025). Co-production of smart eldercare between technology and service-oriented companies in China. *The Geographical Journal*, *191*(1), e12616. https://doi.org/10.1111/geoj.12616

Zhao, T., Gao, Y., Zhan, W., Sun, H., Zhang, T., Li, L., Zuo, W., Tang, X., Li, Y., & Tian, Y. (2024). Municipal solid waste (MSW) under the population shrinking and aging: Spatio-temporal patterns, driving forces, and the impact of smart city development. *Journal of Cleaner Production*, *434*, 140124. https://doi.org/10.1016/j.jclepro.2023.140124

Article history: Received: 03.03.2025 Revised: 05.06.2025 Accepted: 27.06.2025 Available online: 30.06.2025

Geojournal of Tourism and Geosites

Year XVIII, no. 2 supplement,
vol. 60, 2025

ISSN 2065-0817
E-ISSN 2065-1198