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WATUKARUNG BEACH DEVELOPMENT STRATEGY TO SUPPORT THE GUNUNGSEWU PACITAN GLOBAL GEOPARK, EAST JAVA

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Abstract: This research was conducted to evaluate the physical and social potentials of Watukarung Beach, Pacitan, and further formulate a sustainable tourism development strategy within the framework of supporting the Gunungsewu Global Geopark. The methodological design applies a mixed method approach that integrates quantitative assessment through the Tourism Suitability Index and quantitative SWOT analysis, combined with a qualitative approach through in-depth interviews, direct field observations, documentation, and focus group discussions (FGD). Quantitative data were analyzed to assess physical suitability and strategic positioning, while qualitative data were used to interpret community perspectives, governance dynamics, and socio-institutional transformations. The findings indicate that Watukarung Beach is highly suitable for marine-based tourism development, as evidenced by high IKW scores supported by physical characteristics such as world-class surf waves, sandy and coral beach morphology, coastal vegetation functioning as natural protection, and the absence of harmful marine biota. From a social perspective, the local community has experienced a significant occupational shift from primary sectors (fisheries and agriculture) to the community-based tourism (CBT) service sector, demonstrating an adaptive transformation in response to tourism growth. However, this transition also presents several challenges, including regulatory constraints, competition among tourism business actors, spatial utilization conflicts, and limited systematic governance mechanisms. The SWOT analysis positions the region within the Strength-Opportunity quadrant, indicating that strong internal potentials can be optimized to take advantage of emerging opportunities in sustainable tourism and geopark branding. Overall, this study concludes that collaborative and integrative governance that harmonizes ecological conservation, socio-cultural empowerment, and economic diversification is essential to realize Watukarung Beach as a sustainable and globally competitive ecotourism destination.

Keywords: Watukarung Beach, sustainable tourism, Community-Based Tourism (CBT), Global Geopark Gunungsewu

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INTRODUCTION

Coastal areas have long been the center of global tourism development, accounting for about 80% of the world's total tourist destinations (Danilović Hristić et al., 2024). In the post-pandemic era, demand for nature-based coastal tourism increased significantly due to preference shifts toward health, outdoor recreation, and environmental awareness (Kritikos et al., 2025; Li et al., 2023). This trend has strengthened a new paradigm of sustainable, measurable, and inclusive tourism that prioritizes environmental carrying capacity, ecosystem services, and the well-being of host communities (Shieh & Chang, 2026). This tourism development paradigm is in line with the theory of the Tourism Area Life Cycle (TALC) Model developed by Butler (1999). The model explains how coastal destinations transition from exploration to consolidation, but may eventually stagnate if governance, ecological resilience, and socio-spatial integration are neglected (Jin et al., 2025). Recent studies using TALC emphasize that the stagnation phase tends to generate spatial inequalities, environmental degradation, and shifting place identities especially in emerging Global South destinations (Córdoba Azcárate, 2025; Romão, 2025). This theory describes the development of coastal tourist destination patterns starting from the stages of exploration, development, to potential stagnation that brings complex ecological and social implications.

In line with that, in the context of developing countries, especially Indonesia, coastal tourism is often positioned as one of the tools to obtain foreign exchange and economic growth. In the context of developing countries such as Indonesia, coastal tourism is often positioned as a strategic tool for economic growth and foreign exchange revenues. Previous studies highlight that the development of the tourism sector may encourage broader economic advancement through industrial integration and the strengthening of regional tourism competitiveness (Lu, 2022). Indonesia as an archipelagic state with more than 80,000 km of coastlines has significant potential for marine tourism (Arinta & Sumarmi, 2022; Naja et al., 2021). Marine tourism

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potential can be observed through ecosystem diversity, physical coastal dynamics, and socio-cultural characteristics (Marlina & Astina, 2020; Sumarmi et al., 2024; Zhao et al., 2024). The emerging literature also highlights how marine tourism contributes to rural transformation, livelihood diversification, and cultural reproduction in coastal communities (Wei et al., 2024). In this context, tourism development strategies should also consider environmental sustainability and social resilience amid increasing mobility and regional transformation (Brenner et al., 2022). This potential places Indonesia as a strategic region in the formation of marine tourism investment in Southeast Asia (Supriyanto, 2022). One of the districts in Indonesia that has an exotic coastal landscape and is included in the area that supports the Gunungsewu Global Geopark is Pacitan.

One of Indonesia's regencies with coastal tourism potential that supports the Gunungsewu Global Geopark is Pacitan. Pacitan Regency is located in East Java Province in the southwest part of the province. The district is geographically remote approximately 296 km from the provincial capital. Despite its peripheral position, Pacitan demonstrates a growing tourism sector driven by niche markets and nature-based recreation, consistent with theories of marginal development and peripheral tourism (Peng et al., 2024). One of the areas that is starting to receive attention on a national and international scale is Watukarung Beach. Watukarung Beach is known to domestic and foreign tourists because there are surfing activities. Watukarung Beach, in particular, has gained national and international attention due to its world-class surfing waves, unique coastal morphology, and relatively well-maintained environmental quality. The involvement of the local community in providing homestays, culinary services, and travel guidance positions Watukarung as a relevant case of Community-Based Tourism (CBT) within the Gunungsewu Global Geopark zone. Community-based tourism is a means to ensure that the tourism industry benefits the locals by improving their standard of living and quality of life, while tourism development should cater equally well to residents' well-being and tourists' needs and expectations (Strydom et al., 2018). Thus, Watukarung is not only a representation of local tourism potential but also a reflection of local power to go global.

However, coastal tourism development in sites such as Watukarung often remains pragmatic and infrastructure-oriented, lacking integration with spatial data, landscape carrying capacity, and socio-institutional analyses for long term planning (Shiri et al., 2025). Literature shows that top-down development models may perpetuate the "developmentalism trap," where state-led spatial classifications risk marginalizing local actors and producing uneven access to coastal resources. Various destination development initiatives tend to adopt a top-down approach oriented towards purely physical development, without paying attention to local institutional dynamics and social practices of communities (Shiri et al., 2025).

This development approach is seen as part of the developmentalism trap, which is that the arena emphasizes data and spatial classification too much, but risks causing access inequality and injustice in space management (Grydehøj et al., 2025). Previous research on the development of coastal tourism in Indonesia has generally focused on assessing land suitability or mapping potential destinations (Sumarmi et al., 2024), but it is still relatively limited to construction to the community and supports the global geopark. The gap research in this study is to reflect on the use of quantitative instruments such as the Tourism Suitability Index and SWOT analysis in shaping the development narrative and destination governance structure.

The aim of this study is to assess the physical suitability and socio-community conditions of Watukarung Beach as a sustainable coastal tourism destination supporting the Gunung Sewu Global Geopark. Specifically, the study evaluates tourism suitability, community perceptions and participation, and destination development strategies (SWOT) to formulate a balanced management model integrating ecological conservation, educational values, and local economic benefits.

METHOD

Research Design

This study adopts a mixed methods approach that integratively combines quantitative and qualitative techniques (Sumarmi et al., 2024). This approach is used to answer the complexity of the coastal area of Watukarung Beach both from a physical and social perspective. This study formulates a development strategy for Watukarung Beach by identifying spatial development over the last 10 years. In addition, this research consists of three stages that are integrated in the form of the initial to the third stage. The initial stages of the research are focused on the identification and evaluation of the potential of the area, which includes physical and social conditions simultaneously. The evaluation of physical potential is carried out through the calculation of the Tourism Suitability Index by referring to the assessment model from (Arinta & Susilo, 2023; Sumarmi et al., 2024). The parameters analyzed include the width of the beach, beach morphology, slope slope, presence of fresh water, land cover vegetation, and potential disturbances from harmful marine life (Arinta & Susilo, 2023).

This measurement was carried out directly at Watukarung Beach, Pacitan. On the other hand, social conditions are explored through surveys of the perception and participation of local communities. The survey instrument is designed to capture citizens' views on the existence of tourism, their level of involvement in tourism activities. Respondents were selected purposively, including local business actors (such as homestay owners and surfboard rental service providers), traditional leaders, and youth groups. The second stage is to analyze the strengths, weaknesses, opportunities, and threats (SWOT) faced by Watukarung Beach in its development as a community-based tourist destination. In contrast to conventional SWOT analysis, this study uses a quantitative approach that is based on scores and weights on each indicator, as recommended by Helms & Nixon (2010). Primary data from the field and secondary data from regional planning documents are integrated to produce a mapping of the strategic position of the region in a SWOT matrix. These results became the basis for developing a development strategy for Watukarung Beach, Pacitan. The final stage of the research is focused on the formulation of development strategies that are in line with the principles of Community-Based Tourism (CBT). The strategy is designed based on the results of the integration of tourism suitability index analysis and SWOT mapping, then validated participatively through Focus Group Discussion. The Focus Group Discussion involved various elements such as village government officials, homestay managers, Pokdarwis (Tourism Awareness Groups), MSME actors,

and other local community representatives. Overall, this study was compiled by considering the integration of spatial data, structural analysis, and contextual understanding of local communities. The approach used not only presents results that can be measured quantitatively, but also how the impact of Watukarung Beach tourism on the community qualitatively.

This development strategy was formulated as an answer to the needs of destination development and the social impact of the Watukarung Beach community in sustainable tourism development to support the Gunungsewu Global Geopark. The research flow can be seen in Figure 1 and the research location in Figure 2.

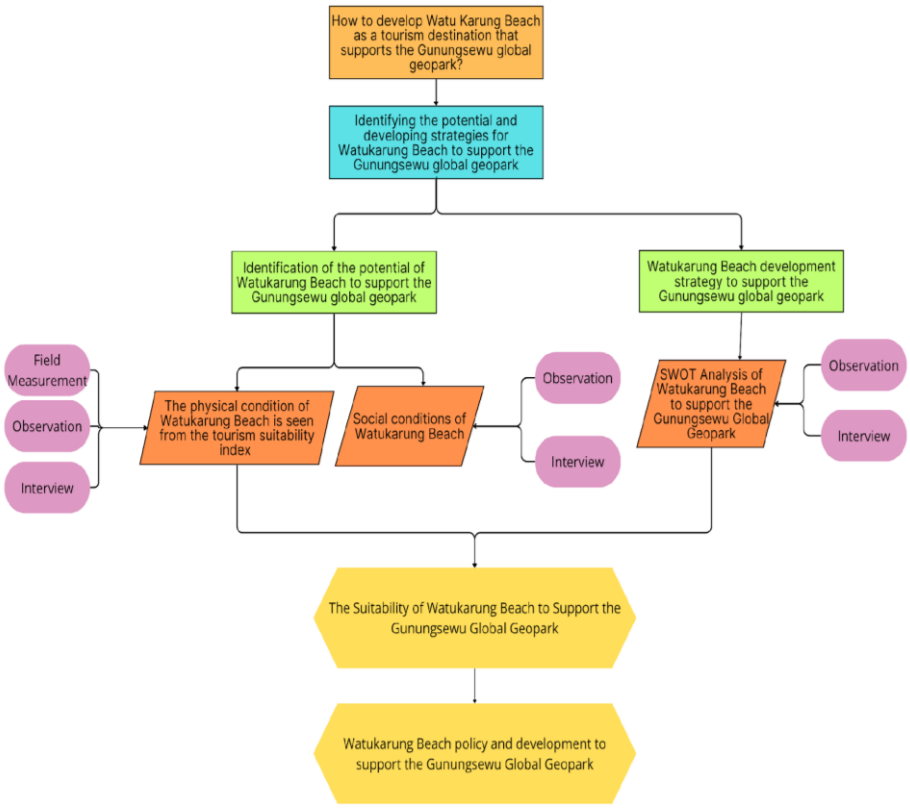

Figure 1. Research Flowchart for Development Of Watukarung Beach to Support The Gunungsewu Global Geopark (Source: Researcher, 2025)

Figure 2. The Study Site in Watukarung Beach, Watukarung Village,
Pringkuku District, Pacitan Regency, East Java (Source: Inageoportal, 2025)

Research Subject

The research subjects were determined by purposive sampling by setting several criteria that are also limitations for the informants involved. The determination of criteria is based on the role in the development of Watu Karung Beach. The subjects in this study consisted of the Tourism Awareness Group (Pokdarwis), the Community Supervisory Group (Pokmaswas) in Watu Karung Village, Pringkuku District, Pacitan Regency, stall owners, homestay owners.

Table 1. Research Respondents

No	Respondents	Role
1	Village Head	Organizing village government and supporting tourism development policies
2	Pokmaswas Watukarung Beach	Overseeing the conservation and preservation of the coastal area of Watukarung
3	Pokdarwis Watukarung Bersatu	Driving community-based tourism development activities
4	Warung and Homestay owners	Community members who feel the economic impact of tourism activities

Data Collection

The data in this study was collected to measure the physical and social conditions of Watukarung Beach. Physical condition measurements are carried out through direct observation and measurement in the field, using indicators such as beach ridge width, beach type, beach morphology, slope level, distance to freshwater sources in the form of springs around the coastline, land cover in coastal areas, and the presence of harmful biota (Arinta & Susilo, 2023; Sumarmi et al., 2024). These indicators refer to the standard of the tourism suitability index which has been proven to be applicable in coastal area planning studies. Qualitative data collection was carried out through observation techniques, in-depth interviews, and field documentation.

a) Observation is carried out directly with field recording techniques which are then compiled into structured reports to explain the events or objects that are the focus of the research (Sumarmi et al., 2024). Observation in the context of Watukarung Beach includes observations of facilities and objects such as road access to the beach, camping grounds, the existence of river mouths and lagoons, coastal forest vegetation, tourism management offices, stalls and homestays that have been or are being built, as well as tourist activities that take place around the beach.

b) In-depth interviews were conducted with key informants using semi-structured interview guidelines. This interview aims to explore the views, experiences, and expectations of informants on the condition and development of tourism in Watukarung Beach. In this study, interviews were conducted with the chairman of the "Watukarung Bersatu" Pokdarwis, stall and homestay owners, beach visitors, and local community leaders (Arinta & Susilo, 2023).

c) Documentation is carried out to record the actual condition of the beach and social activities using cameras, drones, as well as the collection of visual data in the form of photos, videos, and spatial images from digital maps. This documentation not only serves as a complement to observation data, but also as material for verification and triangulation of interview results.

In order to increase the validity of the data, especially in the formulation of the development strategy of Watukarung Beach to support the Gunungsewu Global Geopark, a group discussion forum was held. Targeted Group Discussions involving stakeholders such as tourism managers, village governments, coastal supervisory community groups (Pokmaswas), tourism business actors, and other local community representatives.

Data Analysis

The data analysis in this study uses two main methods, namely scoring and quantitative SWOT analysis. The scoring method is used to assess indicators of physical land suitability in the Watukarung Beach area. The purpose of this data analysis is to index the suitability of Watukarung Beach tourism in supporting the Gunungsawu Global Geopark. The assessment was carried out on a number of physical indicators such as beach width, morphological type, slope slope, distance to freshwater sources, coastal vegetation cover, and potential disturbances from harmful biota. Each indicator is given a score based on a specific classification, then accumulated to produce the total value of the Tourism Suitability Index (Arinta & Susilo, 2023; Botero et al., 2015; Sumarmi et al., 2024). This assessment helps determine the strategic position of Watukarung Beach in the map of coastal tourist destinations in Pacitan Regency, as well as provides a basis for spatial planning based on ecological potential. The results of the scoring criteria can be seen in Table 2.

Table 2. Indicators for Asessing Physical Conditions (Source: (Arinta & Susilo, 2023; Botero et al., 2015; Sumarmi et al., 2024)

No	Indicators	Description	Score	Data collection technique	Note
1	Width of beach ridge vegetation	>75 m	4	Observation	Modifications were made to the assessment. The appropriate score for the suitability of beach tourism is above, with the highest score of four.
		50-74 m	3		
		25-49 m	2		
		<25 m	1		
2	Beach type	Sandy	4	Observation	
		Sandy with coral	3		
		Rocky	2		
		Muddy	1		
3	Type morphology	Gently sloping	4	Observation	
		Sandy hilly beach	3		
		Rocky beach	2		
		Steep rocky beach	1		
4	Slope inclination	< 10%	4	Observation	
		10-25%	3		

		26-45%	2		
		> 45%	1		
5	Distance to freshwater in the form of springs from nearshore beaches	< 500 m	4	Observation	
		500-1000 m	3		
		1001-1500 m	2		
		> 1500 m	1		
6	Coastal land cover	Coconuts, open land	4	Observation	
		Bush, savanna	3		
		Tall shrubbery	2		
		Mangrove forests	1		
7	Dangerous biota	None	4	Interviews	
		Sea urchins, jellyfish	3		
		Sea urchins, jellyfish, stingrays	2		
		Sea urchins, jellyfish, stingrays, lionfish, sharks	1		

In addition, SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis is used to identify internal and external factors that affect tourism development at Watukarung Beach (Amirshenava & Osanloo, 2022; Helms & Nixon, 2010; Sumarmi et al., 2024). Internal factors include strengths such as the presence of world-class waves for surfing and the active participation of local communities, as well as weaknesses such as limited infrastructure and accessibility.

External factors include opportunities from increasing tourism trends after the pandemic and regulatory support from local governments, as well as threats from potential environmental degradation and coastal land conversion.

Scoring on SWOT variables is carried out by weighting techniques to obtain the total score of each factor. SWOT results can be used to position Watukarung in the strategy quadrant. This strategy quadrant is the basis for compiling recommendations for the Watukarung Beach tourism development strategy in supporting the Gunungsawu Global Geopark. The SWOT analysis results indicator table can be seen in Table 4. After assessing each of the physical condition indicators above, a comprehensive assessment and classification were carried out to determine the level of suitability of the physical condition as a tourist attraction, as depicted in Table 3. Social data in this study was obtained through qualitative interviews analyzed using Miles and Huberman's interactive analysis model (Sumarmi et al., 2024). This analysis process is carried out in stages starting from data transcription, thematic reduction, presentation of data in the form of tables and matrices, to drawing and verifying conclusions through triangulation and member checking. This approach was chosen because it allows for the contextual exploration of social significance to local practices that develop in Watukarung Beach, especially in tourism management to support the Gunungsewu Global Geopark. The data reduction was carried out by focusing on the main issues such as public perception of tourism at Watukarung Beach, the form of participation, and the governance challenges faced. The data is then compiled in a narrative map and thematic analysis matrix to facilitate the process of interpretation and reading the relationships between categories. Verification is carried out by re-involving the main informant to ensure the validity of the meaning and interpretation built by the researcher. These qualitative findings add to information related to the involvement of all elements in Watukarung Beach Tourism.

Table 3. Classification of the results of physical condition assessment (Source: Arinta & Susilo, 2023; Botero et al., 2015; Sumarmi et al., 2024)

Class	Characteristic	Number
I	Very suitable	≥ 27
II	Suitable	21-27
III	Unsuitable	14-20
IV	Very unsuitable	7-13

Table 4. SWOT Matrix (Source: Sumarmi et al., 2020)

External Audit	Internal Audit		
	Opportunities	Strengths	Weakness
		SO	WO
	Threats	ST	WT

RESULT AND DISCUSSION

1. Description of Watukarung Beach

Watukarung Beach is located in Watukarung Village, Pringkuku District, Pacitan Regency, East Java Province. This beach is located in Watu Karung Village, Pringkuku District, Pacitan Regency which is 40 km from the center of Pacitan city. Road access to Watu Karung Beach can be reached through private vehicles, both two-wheeled and four-wheeled, considering that there are no public transportation facilities specifically to Watu Karung Beach. In addition, Watu Karung Beach has potential resources, both natural resources, artificial resources and human resources. If all resources are managed properly, it will make this beach one of the tourist assets that will contribute to improving the welfare of the community.

So far, the management of Watu Karung Beach has been managed by the community around the beach which is under the supervision of the Pacitan Regency Tourism Office. Such a management approach indicates the implementation of collaborative governance through community participation and institutional support, which is considered important in achieving sustainable tourism development and regional welfare enhancement (Sampieri et al., 2025). Watukarung Beach, located in Watukarung Village, Pringkuku District, Pacitan Regency, is one of the southern

coastal landscapes of Java that has experienced significant tourism transformation dynamics in the past decade. Being in a geographical configuration that faces directly to the Indian Ocean causes this region to have strong geological and geomorphological characters (Irawan et al., 2024). This geographical position presents the characteristics of high, stable, and consistent waves throughout the year, conditions that are very suitable for surfing activities. Watukarung Beach is one of the beaches in Pacitan Regency which is famous for its waves that are very suitable for surfing activities. In recent years, Watukarung Beach has begun to come into the spotlight in the international community of professional surfers after being identified as one of the best reef break locations in Southeast Asia. The ocean waves that break over these natural coral formations provide the sensation sought by surfers from various countries (Manero, 2025; Giffari, 2024).

From a geological perspective, Watukarung Beach is included in the Southern Mountains Zone, which is dominated by limestone sedimentary rocks and volcanic formations from the Late Cretaceous to Tertiary period. This area is located in the Wonosari Formation which is composed of coral limestone and nape (Utomo & Siregar, 2000). These conditions form a distinctive karst topography, with the presence of natural caves, limestone cliffs, and hollow rocks that interact directly with coastal geomorphological processes. In addition to producing beautiful and unique landscapes, these geological structures also hold the potential to be developed as geotourism destinations, especially in the context of geological interpretation for education and conservation. The condition of Watukarung Beach can be seen in Figure 3.

Figure 3. Landscape of Watukarung Beach (Source: Reseacher, 2025)

Figure 4. Watukarung Beach Activities, Pacitan Regency (Source: Reseacher, 2025)

Another uniqueness of Watukarung Beach has incredible waves with two surfing spots that offer world-class barrels and waves. This beach wave has a reef break type, which will split into two spots, namely right and left, a type of wave that is rarely found on other beaches. Waves that are not too big but strong, both surfers with goofy style and natural style will be very satisfied because of these waves. Geomorphologically, Watukarung is characterized by old limestone formations, white sandy beaches, and offshore coral clusters that form a semi-enclosed coastal contour. The typology of stable, high waves, known as reef breaks, makes this location a world-class surf spot that has been known internationally since the early 2000s. The combination of these physical factors makes Watukarung not only a recreational space, but also a space for ecological and economic contestation. From a social perspective, this area is inhabited by coastal communities with an economic structure that was originally based on the primary sector, especially fisheries and dryland agriculture.

However, with the development of special interest tourism such as surfing and landscape photography, there has been a process of economic diversification through the participation of local residents in the provision of homestay services, coastal culinary, surfboard rental, and informal transportation services. Tourist attractions can be raised as a form of community participation (Wiweka et al., 2020). The emergence of community participation is a form of community-based tourism (Albert et al., 2018). The condition of Watukarung Beach activities can be seen in Figure 4.

The uniqueness of Watukarung Beach is not only reflected in its physical nature and surfing potential, but also from its sharply increased digital exposure. Based on analytics data from Google Trends (2020–2024), online searches for the keyword "Watukarung" have increased by almost 320% over the past four years, with the highest spike occurring during the dry season (May-August), which coincides with the best wave conditions. In addition, user-generated content data on platforms such as Instagram and YouTube shows that Watukarung Beach is one of the most frequently posted destinations in Pacitan, especially by domestic tourists aged 20–35 years. The existence of visual landmarks such as giant rocks resembling "Coral Island" and the brownish-white color of beach sand are often used as visual backgrounds in digital tourism content. This trend not only demonstrates the aesthetic value of the region, but also marks a shift in young tourists' preference towards destinations that are natural, authentic and untouched by mass tourism.

Figure 5. Google Trend Pacitan in 2020-2024 (Data source: https://trends.google.com/trends/explore?date=2020-01-01%202024-12-31&geo=ID-JI&q=%2Fg%2F11b7tsy95k&hl=en accessed on June 25, 2025)

In the last five years (2020–2024), Google Trends data shows that Watukarung Beach has experienced a significant increase in public attention, especially in the East Java region. The results of google trends can be seen in the image in Figure 5. Online search patterns for the keyword "Watu Karung" show relatively consistent seasonal fluctuations, with the highest spikes occurring during long holiday periods such as mid-year (June-July) and year-end (December), which coincide with school holidays and joint leave. This phenomenon reflects the characteristics of beach destinations as seasonal destinations that are greatly influenced by people's free time. The data also indicates a post-pandemic surge in popularity, especially throughout 2022 to 2023, when mobility restrictions were eased. In the context of tourism recovery, this shows that Watukarung beach is one of the destinations that has been responded positively by domestic tourists because it offers outdoor experiences that suit the preferences of post-COVID-19 tourists. This digital popularity is dominated by information seekers from the Pacitan, Yogyakarta, and Malang regions, which confirms Watukarung's position as part of the southern Java destination corridor. Google Trends data can be interpreted as a digital-based tourism demand indicator that reflects people's intentions and interest in accessing information about a destination (Roziqin et al., 2023). In this study, online search trends were used to confirm that Watukarung Beach has a sustainable appeal in the eyes of the public and can be used as one of the supporting parameters in formulating digital promotion strategies (Heliany, 2019). The results of the data on time-based visit management (temporal zoning), as well as the development of destination narratives that are in accordance with the preferences of tourists in the digital era.

Furthermore, Watukarung also has marine economic potential from the traditional fisheries segment which is still an important part of the livelihood structure of coastal communities. Simple fishing systems based on small fishers, distribution of fresh fish for local consumption and tourists, as well as simple processing practices such as grilled fish directly on the coast, are economic added values while supporting the sustainability of local natural resources (N'Souvi et al., 2025; Sari et al., 2021). Overall, the advantage of Watukarung Beach lies not only in its biophysical and landscape aspects, but also in the form of integration between marine tourism potential, local culture, and community economic dynamics. Good ecotourism if there are social, physical, cultural and economic elements that are interrelated (Manero, 2025; Marlina & Astina, 2020). This makes Watukarung an example of a coastal destination that has prospects to be developed as a community-based sustainable tourism model in the southern region of Java. In addition, the spatial

changes in the coastal area of Watukarung Beach in the period from 2010 to 2025 projections show the dynamics of significant land use changes as a result of increasing tourism activities and settlement growth. Based on the map of land use distribution in Figure 6, there has been a consistent and intensive expansion of human settlements from year to year, especially towards coastal areas and low-vegetation areas. Such spatial transformation indicates the concentration of tourism-driven economic activities that subsequently reshape regional land use patterns and settlement structures, reflecting the tendency of economic activities to become spatially concentrated in areas with growing economic opportunities (Martin et al., 1996). This development is in line with the construction of tourist accommodation facilities (hotels/lodging) which began to dominate some coastal spaces since 2020. This phenomenon marks the progressive conversion of land use from vegetative areas and open land to built-up zones, which indicates increased pressure on coastal ecosystems. In addition, the development of parallel transportation roads shows an increase in accessibility that encourages the intensification of space utilization, especially for tourism and economic functions. However, the fragmentation of forest cover and the reduction of tall vegetation as a natural protector of coastlines are crucial indicators of ecological degradation that has the potential to threaten the sustainability of coastal landscapes.

These findings reinforce the argument in the coastal tourism literature that without spatial governance based on ecological carrying capacity and social integration, tourism development tends to drive spatial transformation that is exploitative and less adaptive to environmental sustainability (Arinta & Susilo, 2023). Therefore, spatial planning based on the principles of sustainability, participatory zoning, and ecological protection needs to be developed immediately to ensure the sustainability of the economic, social, and ecological values of the Watukarung Beach area in the future.

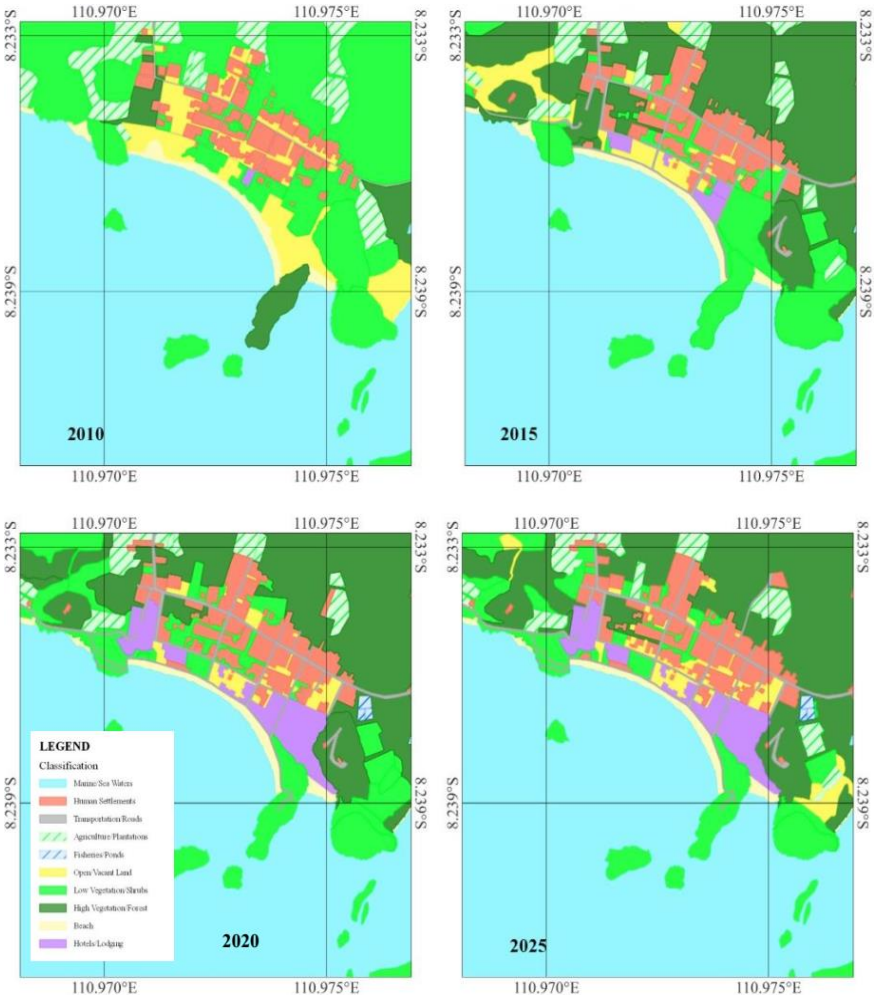

Figure 6. Map of the Distribution of Watukarung Beach Land Use in Pacitan Regency in 2010-2025, a) Classification of land use in Watu Karung Beach in 2010, b) Classification of land use in Watu Karung Beach in 2015, c) Classification of land use in Watu Karung Beach in 2020, d) Classification of land use in Watu Karung Beach in 2025 (Source: Reseacher analysis, 2025)

2. The Condition of Watukarung to be Used as Sustainable Tourism to Support The UNESCO Geopark

a. The physical condition of Watukarung Beach as sustainable tourism to support the Gunungsewu Global Geopark

The assessment of the physical condition of Watukarung Beach was carried out as a first step to determine the level of feasibility of this area in the development of marine tourism. In the framework of sustainable tourism, the physical aspect of coastal areas has an important role in determining the carrying capacity of the environment as well as comfort for tourists (Arinta & Sumarmi, 2022). A number of parameters were used in this evaluation process, including the slope of the coastal slope, the width of the coastal bed, the morphological shape of the coastline, the type of basic substrate,

the condition of land cover in the coastal zone, the distance to freshwater sources such as springs or rivers, the potential for the existence of harmful marine life, as well as the characteristics of sea waves that include the height, length, and type of waves that dominate the area (Arinta & Susilo, 2023; Botero et al., 2015; Sumarmi et al., 2024). The physical condition assessment of Watukarung Beach can be seen in Table 5.

Table 5. Physical Condition of Watukarung Beach, Pacitan Regency (Source: Researcher, 2025)

No	Indicator	Measurement Results	Description	Score
1	Beach Slope	$8^0$40’	Very suitable	4
	Coastline lenght	530 meters		
2	Beach width	28,50 meters	Unsuitable	2
3	Beach type	Sandy with coral	Very suitable	4
4	Beach morphology	Pantai berpasir dan berkarang	Very suitable	4
5	The distance from freshwater availability	1021 meters	Very suitable	4
6	Beach land cover	Sea ketapang, sea pandan, and coconut trees	Very suitable	4
7	Hazardous biota	None	Very suitable	4
Total				**28**
Category				**Very Suitable**

The evaluation of the physical condition of Watukarung Beach was carried out as part of an effort to determine the level of suitability of the area in supporting the development of sustainability-based marine tourism. From the perspective of coastal planning, physical conditions are key elements that affect ecological carrying capacity, tourist comfort, and safety of recreational activities (Sumarmi et al., 2024). Therefore, this study uses a number of standardized parameters in field measurements, including: slope and width of the coast, coastline morphology, substrate type, coastal land cover, distance to freshwater sources, presence of harmful marine life, and characteristics of sea waves.

The results of observations in the field show that Watukarung Beach has a relatively sloping beach morphology, with a fairly wide sand expanse and a stable surface. This condition is very supportive of tourist activities such as swimming, relaxation, and water sports such as surfing. The morphology of the coastline reveals a blend of white sand and coral clusters, forming a landscape that is not only visually beautiful but also attractive for adventure-based tourism and geotourism. The character of high, regular, and consistent sea waves throughout the year plus the natural existence of reef breaks make Watukarung Beach one of the leading surfing locations in the Southeast Asian region, especially for professional surfers from Australia, Europe, and East Asia (Román et al., 2022).

Another aspect that also supports the physical suitability of the area is the existence of coastal vegetation that functions as a natural shade element and stabilizer of the coastal ecosystem. On the east side of the beach, there is a dominance of vegetation such as coconut trees (Cocos nucifera), sea pandanus (Pandanus tectorius), and other coastal shrubs. This vegetation not only provides aesthetic value and thermal comfort for tourists, but also plays an important role in mitigating abrasion as well as maintaining the local microclimate (Yang & Tian, 2025). The distance between the coastline and the freshwater source is about 180 meters, which is within the ideal range for the development of basic service-based tourism facilities, in accordance with the reference for the suitability of coastal tourism. Access to springs available around the area is an important capital to support tourism operational needs, including the provision of clean water for homestays, stalls, and public facilities.

From the safety aspect, there is no existence of dangerous marine life such as jellyfish, sea urchins, and poisonous fish in the intertidal and subtidal zones that are often used as locations for tourist activities. The absence of this risky biota strengthens Watukarung Beach's position as a safe and inclusive tourist area for various age groups, ranging from individual tourists to families (Sumarmi et al., 2024). Overall, based on the evaluation of physical and ecological parameters, Watukarung Beach can be categorized as an area with a very high level of suitability for the development of nature-based marine tourism. The combination of unique landscapes, supportive coastal substrates, optimal ocean wave quality for surfing, as well as the presence of protective vegetation and access to fresh water, makes this area worthy of development as an environmentally friendly, community-oriented, and adaptive tourism destination for sustainable tourism principles.

b. The Social Conditions of Watukarung Beach as Sustainable Tourism to Support The Gunungsewu Global Geopark

The development of tourist destinations in coastal areas generally has a direct impact on the social and cultural order of local communities. Local communities, especially traditional fishing activities or dryland agriculture, are beginning to turn into tourism actors (Al Giffari & Febriamansyah, 2025). This phenomenon also occurs in Watukarung Beach, the commercialization of coastal areas has gradually given rise to new forms of space use that are oriented towards tourism services. In this context, tourism is a strategic opportunity for local communities to improve the level of welfare in the service economy sector and creative micro-enterprises (Chen et al., 2021).

The results of interviews with local tourism actors, homestay owners, and community leaders show that Watukarung Beach has undergone significant socio-economic transformation in the past decade. People who previously depended on dry land for their livelihood from sea and farming, are now switching or increasing their sources of income through tourism economic activities. Economic activities carried out such as opening food stalls, renting surfboards, providing tourist motorcycle taxi services, transportation to managing homestay-based lodging. If at the beginning of 2010 there were only a few stall units that were open seasonally, now there have grown more than ten business units that operate daily, with the

highest intensity during the holiday season and when the tide reaches the ideal peak for surfing. This trend reflects the shift in the local economic structure from the dominance of the primary sector to a service-based economy, which shows the direct contribution of tourism activities to the growth of the informal sector (Lorato et al., 2025).

The tourism management model in Watukarung is developing rapidly with a local community-based approach. This community-based approach (CBT) has an impact on increasing household income, but also strengthens the social capacity of the community in managing change (Sumarmi et al., 2021). Community-based tourism development tends to increase citizen participation rates, expand local employment opportunities, and encourage more responsible tourism behavior, including in aspects of waste management, coastal vegetation conservation, and environmental cleanliness (Mtapuri et al., 2022).

One of the positive implications that can be observed in real terms at Watukarung Beach is the improvement of accessibility and improvement of basic infrastructure. Village roads that connect residential centers with coastal areas have been hardened, facilitating the mobility of visitors and the distribution of logistics for tourism businesses (Arinta & Susilo, 2023; Wolf et al., 2012). In addition, a number of supporting facilities have been built such as prayer rooms, public toilets, rinsing places, and more organized parking areas. This improvement is an important indicator of the successful integration between physical development and the recreational needs of tourists (Lu, 2022). However, the dynamics of rapid change also bring its own challenges to the capacity of local institutions to manage growth in a fair and inclusive manner (Aktymbayeva et al., 2023). Competition between business actors, weak regulations related to zoning, and potential conflicts in the use of space are strategic issues that need serious attention in future area management. Therefore, tourism governance that is collaborative, consensus-based, and sensitive to the diversity of interests of local actors is a fundamental prerequisite. This approach not only directs the development of tourism in Watukarung Beach to an economic orientation, but also ensures the achievement of social justice and ecological sustainability in the long term.

3. Development of Watukarung Beach as a Sustainable Ecosystem to Support The Gunungsewu Global Geopark

SWOT analysis was used in this study to identify the strategic potential of ecotourism development at Watukarung Beach in order to support the Gunungsawu Global Geopark. As explained by (Sumarmi et al., 2024), the SWOT approach allows for a systematic measurement of strengths, weaknesses, opportunities, and threats in tourism development. The results of this SWOT analysis are shown in Table 6, with the IFAS (Internal Factor Analysis Summary) and EFAS (External Factor Analysis Summary).The determination of the strategic position of Watukarung Beach as a tourist area is carried out by calculating the X and Y coordinate values based on the difference in scores between factors. The X value obtained of 0.93 is calculated from the difference between the total strength score (S) and weakness (W), while the Y value of 0.88 is the result of the subtraction between the opportunity score (O) and the threat (T). Based on these coordinates, the strategic position of Watukarung Beach is in Quadrant I in the SWOT matrix, which indicates that this area is in a growth-oriented strategy phase.

Table 6. The Results of the SWOT Analysis of Watukarung Beach (Source: Data Analysis by the Researchers (2025)

Internal Factors (IFAS)					
	Strength (S)	**Level**	**Weight**	**Rating**	**Score**
1	Watukarung Beach has the characteristics of right and left reef break waves that are of international standard, making it a strategic location for world-class surfing tourism.	3	**0.06**	**4**	**0.23**
2	The sloping and wide beach morphology provides a high level of comfort and safety for family tourism activities.	3	**0.06**	**4**	**0.23**
3	The clean, natural brownish-white sand texture enhances the visual appeal of the beach as a coastal recreation destination.	3	**0.06**	3	**0.17**
4	The absence of dangerous marine life such as jellyfish and sea urchins makes this beach safe for swimming and surfing activities.	2	**0.04**	3	**0.12**
5	The availability of fresh water sources within a radius of <500 meters from the coastline meets the criteria for land suitability for coastal tourism development	3	**0.06**	3	**0.17**
6	The natural landscape surrounded by green hills and coral clusters creates a visual uniqueness that supports the development of ecotourism and geotourism.	3	**0.06**	3	**0.17**
7	The active involvement of local communities in the provision of homestays, food stalls, and rental services is an early indicator of the formation of community-based tourism (CBT).	2	**0.04**	3	**0.12**
8	Tourism activities have provided economic diversification for the community, from fishermen to tourism service business actors.	1	**0.02**	3	**0.06**
9	Accessibility to the site has increased significantly through the construction of concrete roads and local transportation connectivity.	2	**0.04**	3	**0.12**
10	The popularity of Watukarung Beach is increasing among international tourists, especially from the global surfing community.	2	**0.04**	3	**0.12**
11	Google Trends shows an increasing trend of searches related to Watukarung Beach during the 2020–2024 period, showing an increasingly strong digital presence.	2	**0.04**	3	**0.12**
12	The availability of undeveloped open land provides opportunities for the development of sustainable tourism facilities in the future.	2	**0.04**	3	**0.12**
13	The location adjacent to other tourist destinations in Pacitan allows the integration of regional development in thematic tour packages.	2	**0.04**	3	**0.12**
			0.00	**37.00**	**1.62**
	Weakness (W)				

1	Accessibility to the location is not optimal with a path that is not friendly to large vehicles and the lack of adequate public transportation facilities and pedestrian paths.	3	**0.06**	2.9	0.2
2	Destination promotion and branding are still informal. has not been integrated in a broad, data-driven digital marketing system.	3	**0.06**	2.9	0.2
3	The arrangement of tourist spaces is still not optimal, there are semi-permanent buildings that appear without clear zoning planning.	2	**0.04**	2.5	0.1
4	The absence of a periodic environmental monitoring and evaluation system causes the potential for degradation of coastal ecosystems to not be detected early.	1	**0.02**	2.0	0.0
5	The lack of a professional and formal legal tourism management institution has caused coordination between stakeholders to be less effective.	3	**0.06**	2.3	0.1
6	The interaction between tourists and local communities has not been packaged in an educational and cultural framework	2	**0.04**	2.3	0.1
			0.00	**14.90**	**0.69**
Total		**44**	**0.85**	**51.90**	**0.69**
X = Strength-Weakness			**0.93**		
Eksternal Factors (EFAS) Opportunities (O)					
1	Increasing trends in special interest tourism such as surfing and ecotourism globally.	3	0.07	4	0.28
2	The availability of open land for the development of environment-based tourism infrastructure.	3	0.07	4	0.28
3	Government support for tourism village and community-based tourism programs.	3	0.07	3	0.21
4	The growth of digital promotion through social media and online booking platforms.	2	0.05	3	0.14
5	Geographical proximity to other destinations allows for the integration of tour packages.	1	0.02	3.5	0.08
6	Potential collaboration with the surfing community and international event organizers.	1	0.02	3	0.07
7	The availability of potential natural resources for the development of educational tourism.	2	0.05	3	0.14
8	There are opportunities for research development and academic partnerships in the field of coastal tourism.	2	0.05	3	0.14
9	The possibility of establishing destination branding based on local and ecological narratives.	2	0.05	3	0.14
Total			0.31	20.50	1.50
	Threat				
1	The risk of environmental degradation due to increased visits without carrying capacity control.	3	0.07	2.9	0.21
2	Competition with other beach destinations in East Java that developed first.	3	0.07	2.5	0.18
3	The lack of regulation and sustainable governance can trigger conflicts in the use of space.	2	0.05	2.5	0.12
4	Potential conflicts of interest between external investors and local communities.	1	0.02	2.5	0.06
5	The tendency to exploit land for accommodation without spatial planning.	1	0.02	2.4	0.06
			0.24	12.80	0.62
Total		**29**	**0.54**	33.3	2.1
Y = Opportunity-Threat			**0.88**		

This means that Watukarung Beach has the dominance of internal forces and external opportunities that can be optimally utilized for the development of ecotourism-based destinations and community economies.

A graphical representation of this strategic position can be seen in Figure 7, which shows that although this area is still in the development stage, its superior potential can push it towards a socially, ecologically, and economically sustainable marine tourism destination model.

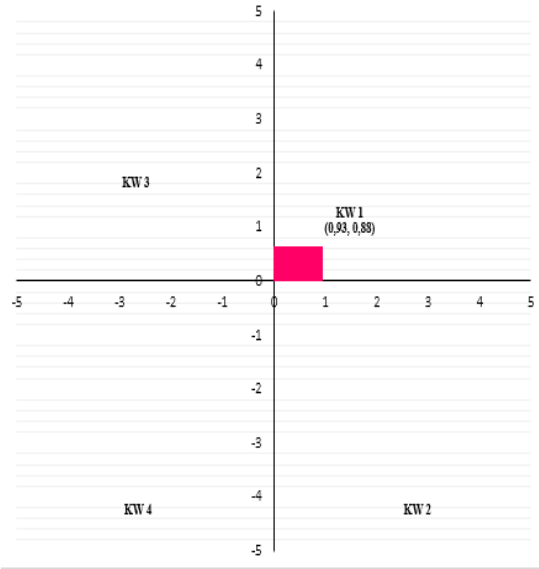

Figure 7. Kuadran of Watukarung Beach (Source: Data Analysis by the Researchers (2024)

Based on the results of the SWOT analysis. Watukarung Beach is in quadrant I or Strength-Opportunity (SO) which indicates that the region has a combination of internal strengths and external opportunities that are very supportive for sustainable tourism development. This strategic position shows that Watukarung Beach has advantages as a marine tourism destination that is not only supported by natural beauty and unique characteristics of sea waves. But also by the active participation of the community in the management of the tourism sector independently.

Therefore, growth-oriented strategies need to be implemented. This strategy includes increasing physical accessibility through widening roads to coastal areas. Improvement of basic infrastructure such as sanitation facilities and rinsing places and the arrangement of public areas to better support the comfort and safety of visitors.

In addition to these main strategies the analysis also identifies the need to implement policies in the WO (Weakness–Opportunity) quadrant to address internal weaknesses by taking advantage of external opportunities. In the context of Watukarung Beach this includes strengthening coordination between local tourism management groups such as Pokdarwis with village governments and other external partners. to improve institutional capacity and destination governance. The strategy in the ST (Strength–Threat) quadrant emphasizes the importance of developing tourism facilities such as the addition of family-based homestays. Provision of Geotourism Information Center as well as other supporting facilities to face the threat of increasing the number of visits and competition between destinations.

This strategy also aims to maintain service quality and destination competitiveness in a sustainable manner. The WT (Weakness–Threat) strategy is focused on strengthening tourism attractions and promotion through creative and collaborative approaches. such as the implementation of educational tour packages based on geology and local culture. as well as optimizing digital promotions through social media. This approach is needed to mitigate the risk of destination marginalization due to limited promotion and the potential pressure of uncontrolled mass tourism.

Thus, the results of the SWOT analysis as a whole strengthen the argument that Watukarung Beach has great potential as a community-based ecotourism destination that is not only able to improve local welfare but also support the conservation and education vision of the Gunung Sewu Global Geopark network.

4. The Startegy of Watukarung Beach Development to support the Gunungsewu Global Geopark

The results of the SWOT analysis show that Watukarung Beach is very feasible to be developed as ecotourism to support the global geopark of Gunungsewu. Internal strengths are the beauty of the karst landscape, wave quality, and active community participation. The development of this area still requires a series of steps to strengthen both institutional, human resources and accessibility. The main goal of this development is to integrate the physical and social potential of Watukarung Beach in a sustainable manner to support the Gunungsewu Global Geopark. Table 7 presents the development strategy based on the results of the SWOT analysis.

Table 7. The Strategy of Watukarung Beach Development to Support the Gunungsewu Global Geopark

Management	Human Resources (HR)	Accessibility
1. Development of tourist facilities such as public toilets. Prayers. community homestay. local food stalls. and eco-friendly visitor shelters.	1. Increase the active involvement of the surrounding community. especially fishermen and dryland farmers groups through the "Watukarung Bersatu" Pokdarwis.	1. Repair and widening of road access to Watukarung Beach from the center of Pacitan city and nearby villages.
2. Zoning arrangement of tourist spaces: conservation areas. recreation area. and participatory community business zones.	2. Strengthening collaboration between Pokdarwis. Pokmaswas. and the village government in the integrated management of coastal areas.	2. Provision of local tourist transportation (shuttle) and increased connectivity with the southern Java (JLS) route.
3. Development of ecotourism concepts that raise geological values (karst). local culture. and educational activities such as the introduction of eco-friendly surfing.	3. Training and assistance for micro businesses such as homestay management. coastal cuisine. Local guide services. and the creation of crafts based on local resources.	3. Installation of directional signs and interpretation maps of geopark areas at strategic points.
4. Revitalization and rebranding of local cultural events such as sea alms rituals. Squirrel. and beach art festivals.		4. Optimization of digital promotions through social media. website. and national-international ecotourism platforms.
5. Preparation of clear regulations and institutional structures regarding the use of space. Contribution of Tourists. and community-based tourism levies.		

A key factor in strengthening the attractiveness of Watukarung Beach is accessibility. Ease of accessibility is a fundamental element in supporting tourists' decision to visit a destination (Mtapuri et al., 2022). Therefore, Real interventions are needed such as widening the main route to the coast and providing local modes of transportation. The integration of the Watukarung area in the South Java Cross (JLS) network that connects the southern coastal districts of East Java and Yogyakarta. Adequate accessibility also encourages a more equitable distribution of visits and has the potential to reduce the burden on mass tourist destinations around the geopark area (Al Hazar & Astina, 2024).

Local governments and other stakeholders have an important role in supervising and facilitating community activities. One form of constructive supervision is to support annual cultural activities such as *suroan* and sea alms (Astina et al., 2021). The involvement of local communities is a key aspect in the successful management of ecotourism destinations

because of experience and knowledge (Suyatna, 2021; Wilujeng et al., 2024) and their local practices are very relevant in maintaining the sustainability of environmental services (Sumarmi et al., 2020). Therefore, the preparation of an integrative spatial development plan is required. including the delineation of conservation zones. Tourist Space and community-based supporting infrastructure. The map of the development plan of the Watukarung Beach area and several tourist attractions in Pacitan as an ecotourism node and part of the Mount Sewu Geopark network can be seen in Figure 8.

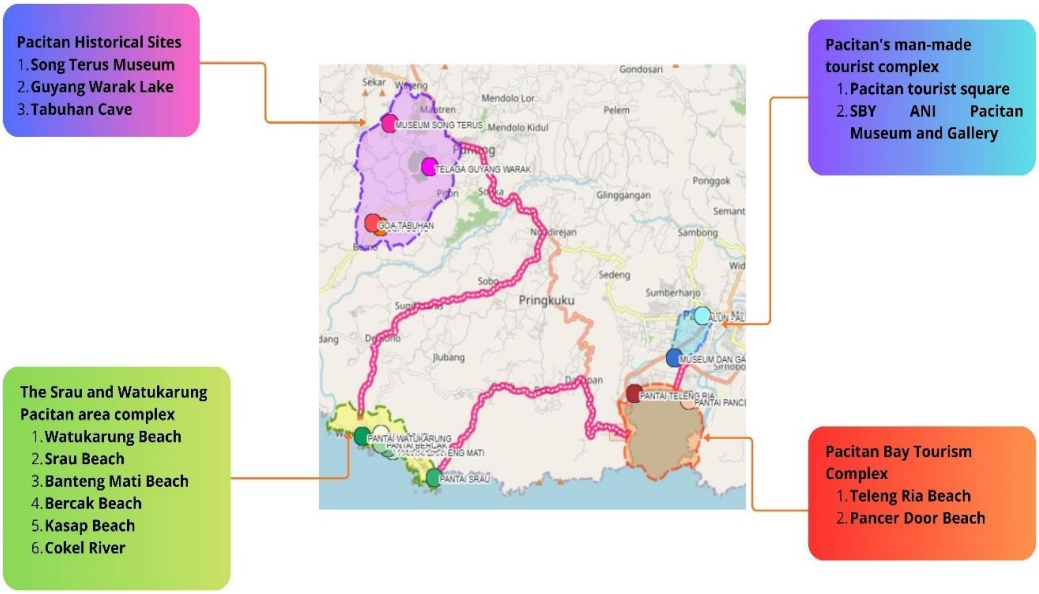

Figure 8. Spatial Map of The Distribution of Objects in The Pacitan Region (Source: Data analysis by the researchers (2025)

CONCLUSION

Watukarung has a very significant potential to be developed as a sustainable ecotourism destination that supports the existence of the Gunungsewu Global Geopark. The results of the physical evaluation showed a very high level of suitability for nature-based tourism activities, especially in the characteristics of coastal geomorphology, beach quality, and the integrity of the karst landscape which are the typical elements of this region.

From the social aspect, the community has undergone institutional transformation through the Community-Based Tourism (CBT) approach, where community involvement in destination management not only increases social capacity, but also provides more inclusive economic benefits and strengthens a sense of ownership of local resources.

The results of the SWOT analysis placed this region in the Strength–Opportunity (SO) quadrant, which shows that Watukarung has internal strengths that can be maximized to capture external opportunities.

Therefore, the destination development strategy is directed at strengthening community institutions and destination managers, increasing the capacity of human resources in the field of tourism and conservation, and improving regional accessibility and connectivity. With this approach, Watukarung has a great opportunity to become a leading destination that balances ecological, social, and economic aspects in harmony. Ecotourism-based development and geoparks not only strengthen tourist attractions, but also contribute to the conservation of karst landscapes and geological heritage, the empowerment of local communities, and the improvement of community welfare through income diversification.

In the long term, this model has the potential to be an example of best practice for the development of coastal destinations based on geoparks and local wisdom at the national and international levels.

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REFERENCES

Aktymbayeva, A., Nuruly, Y., Artemyev, A., Kaliyeva, A., Sapiyeva, A., & Assipova, Z. (2023). Balancing nature and visitors for sustainable development: Assessing the tourism carrying capacities of Katon-Karagay National Park, Kazakhstan. *Sustainability*, *15*(22), 15989. https://doi.org/10.3390/su152215989

Al Hazar, B., & Astina, I. K. (2024). The Implementation of the Mappalili Ceremony as Cultural Tourism in Supporting the Maros-Pangkep Global Geopark, Indonesia. *Geo Journal of Tourism and Geosites*, *57*, 1980–1990. https://doi.org/10.30892/gtg.574spl12-1365

Amirshenava, S., & Osanloo, M. (2022). Strategic planning of post-mining land uses: A semi-quantitative approach based on the SWOT analysis and IE matrix. *Resources Policy*, *76*, 102585. https://doi.org/10.1016/j.resourpol.2022.102585

Arinta, D., & Sumarmi, D. (2022). Quality and Carrying Capacity Of Beaches For Recreational Activities In Ampelgading District, Malang Regency, Indonesia: High Or Low. *GeoJournal of Tourism and Geosites*, *40*(1), Article 1. DOI 10.30892/gtg.40107-803

Arinta, D., & Susilo, S. (2023). Development Of Integrated And Sustainable Community Based Eco-Tourism On Sipelot Beach, Indonesia. *Geo Journal of Tourism and Geosites*, *46*(1), 19–26. https://gtg.webhost.uoradea.ro/PDF/GTG-1-2023/gtg.46102-996.pdf

Astina, I. K., Felicia, M. Y., & Kurniawati, E. (2021). The traditional ceremonies of Tengger Tribe as a sustainable tourism object in Indonesia. *Geo Journal of Tourism and Geosites*, *39*, 1371–1378. https://gtg.webhost.uoradea.ro/PDF/GTG-4spl-2021/gtg.394spl07-780.pdf

Botero, C., Pereira, C., Tosic, M., & Manjarrez, G. (2015). Design of an index for monitoring the environmental quality of tourist beaches from a holistic approach. *Ocean & Coastal Management*, *108*, 65–73. https://doi.org/10.1016/j.ocecoaman.2014.07.017

Brenner, N., & Ghosh, S. (2022). Between the colossal and the catastrophic: Planetary urbanization and the political ecologies of emergent infectious disease. *Environment and Planning A: Economy and Space*, *54*(5), 867–910. https://doi.org/10.1177/0308518X22108431

Butler, R. W. (1999). Sustainable tourism: A state-of-the-art review. *Tourism Geographies*, *1*(1), 7–25. https://doi.org/10.1080/14616689908721291

Chen, Z., Chen, X., & Mak, B. (2021). The hybrid discourse on creative tourism: Illuminating the value creation process. *International Journal of Culture, Tourism and Hospitality Research*, *15*(4), 547–564. https://doi.org/10.1108/IJCTHR-07-2020-0138

Córdoba Azcárate, M. (2025). Tourism, space, and place: Bridging past, present and future research. *Tourism Geographies*, 27(3–4), 735–755. https://doi.org/10.1080/14616688.2024.2404644

Danilović Hristić, N., Pantić, M., & Stefanović, N. (2024). Tourism as an Opportunity or the Danger of Saturation for the Historical Coastal Towns. *Sustainability*, *16*(10), 4080. https://doi.org/10.3390/su16104080

Giffari, M., & Febriamansyah, R. (2025). Transformation of coastal village on Pahawang Island, Lampung, Indonesia: From a fishing village to a marine tourism village. *Tourism in Marine Environments*. https://doi.org/10.3727/216901925X17513682158305

Grydehøj, A., Xu, J., & Su, P. (2025). Placing islands at risk: Developmentalism, militarism, geopolitics, and the Sendai Framework for Disaster Risk Reduction. *International Journal of Disaster Risk Science, 16*(1), 84–91. https://link.springer.com/article/10.1007/s13753-024-00571-9

Heliany, I. (2019). *[Wonderful Digital Tourism Indonesia Dan Peran Revolusi Industri Dalam Menghadapi Era Ekonomi Digital 5.0]*. Wonderful Digital Tourism Indonesia and the Role of the Industrial Revolution in Facing the Digital Economy Era 5.0. *Destinesia: Jurnal Hospitaliti Dan Pariwisata*, *1*(1), Article 1. https://ojs.stiami.ac.id/index.php/DESTINESIA/article/view/551

Helms, M. M., & Nixon, J. (2010). Exploring SWOT analysis–where are we now? A review of academic research from the last decade. *Journal of Strategy and Management*. https://doi.org/10.1108/17554251011064837

Irawan, L. Y., Panoto, D., Febrianto, A. D., Azizah, V., Farihah, S. N., Aufaristama, M., & Mapa, M. T. (2024). Multi-hazard detection in the southern part of Banyuwangi Regency using a geomorphological approach. *Jàmbá: Journal of Disaster Risk Studies*, *16*(1), 1–11. https://doi.org/10.4102/jamba.v16i1.1586

Jin, J., Laing, R., & Zhu, M. (2025). Co-mapping future scenarios and uncertainties amid climate crisis: A collective study of coastal towns and the Port of Tyne. *Journal of Urban Management*. https://doi.org/10.1016/j.jum.2025.07.002

Kritikos, A., Magoutas, A., & Poulaki, P. (2025). Sustainable Tourism and Regional Development Through Innovation in the Post-COVID-19 Era: The Case of Hersonissos and Chios. *Tourism and Hospitality*, *6*(3), 134. https://doi.org/10.3390/tourhosp6030134

Lorato, T., Beyene, T., & Tadesse, T. (2025). Unintended structural transformation and growth in Ethiopia: An autoregressive distributed lag (ARDL) model approach. *Journal of Innovation and Entrepreneurship*, *14*(1), 55. https://link.springer.com/article/10.1186/s13731-025-00498-5

Lu, Y. (2022). The measurement of high-quality development level of tourism: Based on the perspective of industrial integration. *Sustainability*, *14*(6), 3355. https://doi.org/10.3390/su14063355

Manero, A. (2025). Surfing Economics: Understanding, Managing and Protecting the Value of Surfing Ecosystems. In *The Science and Culture of Surfing* 179–202. Springer. https://link.springer.com/chapter/10.1007/978-3-031-80979-8_9

Marlina, S., & Astina, I. K. (2020). Sustainable marine ecotourism management: A case of marine resource conservation based on local wisdom of bajo mola community in wakatobi national park. *GeoJournal of Tourism and Geosites*, *32*(4), 1317–1323. https://doi.org/10.30892/gtg.32419-575

Martin, R., & Sunley, P. (1996). Paul Krugman's geographical economics and its implications for regional development theory: A critical assessment. *Economic Geography*, *72*(3), 259–292. https://www.tandfonline.com/doi/abs/10.2307/144401

Mtapuri, O., Camilleri, M. A., & Dłużewska, A. (2022). Advancing community-based tourism approaches for the sustainable development of destinations. *Sustainable Development*, *30*(3), 423–432. https://doi.org/10.1002/sd.2257

Naja, D. A., Suprayogi, S., Marfai, M. A., & Mardiatno, D. (2021). A study on the social network analyses of dive centers and sustainable tourism development in Pemuteran Bali, Indonesia. *Geo Journal of Tourism and Geosites*, *36*, 603–615. https://gtg.webhost.uoradea.ro/PDF/GTG-2spl-2021/gtg.362spl07-689.pdf

N'Souvi, K., Sun, C., & Rivero, Y. M. R. (2025). Development of marine small-scale fisheries in Togo: An examination of the efficiency of fishermen at the new fishing port of Lomé and the necessity of fisheries co-management. *Aquaculture and Fisheries*, *10*(2), 344–353. https://doi.org/10.1016/j.aaf.2023.07.009

Peng, X., Yan, S., & Yan, X. (2024). Studying whether the digital economy effectively promotes China's common prosperity based on the spatial Durbin model. *Humanities and Social Sciences Communications*, *11*(1), 1–14. https://www.nature.com/articles/s41599-024-04132-9

Román, C., Borja, A., Uyarra, M. C., & Pouso, S. (2022). Surfing the waves: Environmental and socio-economic aspects of surf tourism and recreation. *Science of the Total Environment*, *826*, 154122. https://doi.org/10.1016/j.scitotenv.2022.154122

Romão, J. (2025). Tourism Area Life Cycle, Evolutionary Tourism Development and Path Dependence. In Economic Geography of Tourism 23–39. Springer. https://doi.org/10.1007/978-3-031-88626-3_2

Roziqin, A., Kurniawan, A. S., Hijri, Y. S., & Kismartini, K. (2023). Research trends of digital tourism: A bibliometric analysis. *Tourism Critiques: Practice and Theory*, *4*(1/2), 28–47. https://doi.org/10.1108/TRC-11-2022-0028

Sampieri, S., & Mazzetto, S. (2025). Public–Private Partnership for the Sustainable Development of Tourism Hospitality: Comparisons Between Italy and Saudi Arabia. *Sustainability*, *17*(15), 6662. https://doi.org/10.3390/su17156662

Sari, I., Ichsan, M., White, A., Raup, S. A., & Wisudo, S. H. (2021). Monitoring small-scale fisheries catches in Indonesia through a fishing logbook system: Challenges and strategies. *Marine Policy*, *134*, 104770. https://doi.org/10.1016/j.marpol.2021.104770

Shieh, H., & Chang, P. (2026). The Dual Impact of Sustainable Tourism Development on Local Economies and Ecosystems: A Mixed-Method Study in Guangzhou. Corporate Social Responsibility and Environmental Management. https://doi.org/10.1002/csr.70161

Shiri, Z., Le, Q. B., Ouerghemmi, H., & Rejeb, H. (2025). Landscape approaches for sustainable land systems: A critical systematic review of frameworks, governance, and socio-ecological outcomes. Landscape Architecture and Sustainability, 2, 100007. https://icarda.org/publications/50577/landscape-approaches-sustainable-land-systems-critical-systematic-review

Strydom, A. J., Mangope, D., & Henama, U. S. (2018). Making community-based tourism sustainable: Evidence from Free State Province, South Africa.). Making Community-Based Tourism Sustainable: Evidence From The Free State Province, South Africa. *GeoJournal of Tourism and Geosites*, *24*(1), Article 1. https://doi.org/10.30892/gtg.24101-338

Sumarmi, Kurniawati, E., Aliman, M. (2020). Community Based Tourism (CBT) To Establish Blue Economy And Improve Public Welfare For Fishing Tourism Development In Klatak Beach, Tulungagung, Indonesia. *GeoJournal of Tourism and Geosites*, *31*(3), Article 3. https://doi.org/10.30892/gtg.31307-530

Sumarmi, S., Arinta, D., Suprianto, A., & Aliman, M. (2021). The Development Of Ecotourism With Community-Based Tourism (CBT) In Clungup Mangrove Conservation (Cmc) Of Tiga Warna Beach For Sustainable Conservation. *Folia Geographica*, *63*(1), 123. https://www.unipo.sk/public/media/37801/580-THE%20DEVELOPMENT%20OF%20ECOTOURISM%20WITH%20COMMUNITY-BASED%20TOURISM%20(CBT)%20IN%20CLUNGUP%20MANGROVE%20CONSERVATION%20(CMC)%20OF%20TIGA%20WARNA%20BEACH%20FOR%20SUSTAINABLE%20CONSERVATION.pdf

Sumarmi, S., Irawan, L. Y., Arinta, D., Suprianto, A., Kurniawati, E., Graciani, H., Marlina, M., Fahim, N. B. A., Arif, M., Sholeha, D. W., & Shaherani, N. (2024). Tourism Development Strategy Based On Environmental Services With Integrated Coastal Zone Management (ICZM) To Achieve Sustainable Development Goals (SDGS) In Jolosutro Beach Of Blitar Regency Indonesia. *GeoJournal of Tourism and Geosites*, *55*(3), 1377–1391. https://doi.org/10.30892/gtg.55338-1310

Supriyanto, E. E. (2022). Blue tourism: Treating marine ecosystems and increasing the potential of maritime tourism in Indonesia. *Jurnal Kepariwisataan Indonesia: Jurnal Penelitian Dan Pengembangan Kepariwisataan Indonesia*, *16*(2), 138–148. https://ejournal.kemenparekraf.go.id/index.php/jki/article/download/313/72/2194

Suyatna, R. (2021). Evaluasi Pengelolaan Keuangan Desa di Provinsi Banten (Studi Kasus Kabupaten Serang) [Evaluation of Village Financial Management in Banten Province (Serang Regency Case Study)].. *Journal of Public Policy and Applied Administration*. https://jurnal.stialan.ac.id/index.php/jplan/article/view/284

Utomo, E. P., & Siregar, M. S. (2000). *Karstic Groundwater Resources Of The 'Thousand Mountains' Of Wonosari And Wonogiri-Java-Indonesia*. ISRM-IS. https://onepetro.org/ISRMIS/proceedings-abstract/IS00/All-IS00/50331

Wei, C., Xu, H., & Wall, G. (2024). Asset assemblages and livelihood resilience in a coastal community. *Journal of Sustainable Tourism*, 32(5), 904-922. https://www.tandfonline.com/doi/abs/10.1080/09669582.2023.2186826

Wilujeng, I. P., Zutiasari, I., Dhewi, T. S., & Sungkar, A. R. (2024). Exploration and Existence of Local Wisdom as a Marketing Strategy for Sustainable Tourism Development in Banyuwangi. *Dinasti International Journal of Management Science (DIJMS)*, *6*(1). https://doi.org/10.38035/dijms.v6i1.3285

Wiweka, K., Setiawan, B., Wachyuni, S. S., & Adnyana, P. P. (2020). Local perspective of community participation in lake toba as a tourism destination. *International Journal of Tourism & Hospitality Reviews*, *7*(1), 87–94. https://mgesjournals.com/ijthr/article/view/ijthr.2020.7110

Wolf, I. D., Hagenloh, G., & Croft, D. B. (2012). Visitor monitoring along roads and hiking trails: How to determine usage levels in tourist sites. *Tourism Management*, *33*(1), 16–28. https://doi.org/10.1016/j.tourman.2011.01.019

Yang, Z., & Tian, L. (2025). Ecological Waves at Tourist Attractions on the Qinghai-Tibet Plateau Promote Greenness of Surrounding Vegetation. *Land*, *14*(1), 159. https://doi.org/10.3390/land14010159

Zhao, Y., Han, Z., Zhang, C., Wang, Y., Zhong, J., & Gao, M. (2024). Coastal cultural ecosystem services: A bridge between the natural ecosystem and social ecosystem for sustainable development. *Land*, *13*(9), 1352. https://doi.org/10.3390/land13091352

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