



## Strengthening Coastal Community Resilience through Marine Ecotourism in Pangandaran, West Java

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### ABSTRACT

**Purpose** – This study investigates how marine ecotourism can be utilized to strengthen the resilience of coastal communities in Pangandaran, West Java. Despite having rich marine biodiversity and cultural heritage, the region faces socio-economic vulnerability. The research addresses the need for sustainable livelihood alternatives and explores ecotourism as a functional strategy for community empowerment and social stability.

**Design/methods/approach** – Using a qualitative descriptive method, the study collected data through field observations, semi-structured interviews with 10 key local stakeholders, and focus group discussions involving 30 community members, including fishermen, seaweed farmers, homestay operators, and local leaders. Thematic analysis was used to interpret the roles of stakeholders and community dynamics in marine tourism development.

**Findings** – The findings reveal that marine ecotourism has the potential to enhance economic diversification, preserve local knowledge, and promote environmental awareness. Key enabling factors include community participation, skill development, infrastructure support, and integration of local traditions. The application of a functional sociological perspective shows how local institutions and social values contribute to sustainable tourism and community resilience.

**Research implications/limitations** – The study's scope is geographically limited to a single coastal village in Pangandaran, which may affect the generalizability of findings. Limited data on long-term impacts of ecotourism on household income and environmental quality poses a constraint for future assessments.

**Originality/value** – This paper offers a novel sociological lens on coastal ecotourism as a multidimensional empowerment strategy. It contributes to community-based tourism literature by linking functional theory with participatory development and provides a replicable framework for similar coastal areas.

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## Introduction

Coastal communities like Pangandaran in Indonesia are crucial for supporting marine biodiversity, enhancing national food security, and promoting sustainable economic development. The intricate relationship between local ecosystems and the livelihoods of coastal residents underscores the socio-economic vulnerability of these communities,

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particularly when their economies rely heavily on marine resources such as fisheries and tourism. Pangandaran is uniquely positioned due to its extensive coastline and diverse ecological features, leading to both ecological benefits and significant environmental pressures.

Pangandaran has been recognized as a premier tourist destination within West Java, attracting domestic visitors due to its natural beauty and marine tourism potential (Hidayah et al., 2023; . The region's designation as a potential Global Geopark aims to increase tourist engagement, which is intended to contribute to local economic development (Hidayah et al., 2023; Nurhayati et al., 2018). However, the area faces ecological challenges, stemming from its rich marine life, including shallow water sponges and macroalgae, which are vital components of its biodiversity (Hadi et al., 2018; Irpan et al., 2024). Additionally, the presence of Anisakis larvae in local fish species complicates the culinary and fishing sectors, highlighting the health risks involved in local fisheries (Ayun et al., 2021). The rapid expansion of whiteleg shrimp farming has also transformed the economic landscape, imposing new pressures on existing ecological balances in the area (Palupi et al., 2021). Therefore, while the demand for marine resources and tourism supports livelihoods, it must be managed sustainably to prevent degradation of the coastal environment (Astuti et al., 2021; Nijman, 2021).

Consequently, Pangandaran exemplifies the delicate balance that coastal communities must maintain between exploiting marine resources for economic stability and ensuring the preservation of biodiversity. Sustainable practices are essential for mitigating the adverse effects of tourism and fisheries on the local environment, thereby promoting resilience in both ecological and socio-economic terms. Coastal populations, such as those in Pangandaran, Indonesia, face significant socio-economic challenges, exacerbated by increasing tourism commercialization that often marginalizes local communities from decision-making processes and resource benefits.

These communities frequently deal with poverty, inadequate infrastructure, environmental degradation, and heightened vulnerability to natural disasters like tsunamis and coastal flooding. The interaction between tourism development and community livelihoods is critical; however, when local populations are excluded from participation in tourism-related decisions, it leads to a development gap that hampers both environmental management and local economic empowerment. Research indicates that coastal areas are disproportionately affected by poverty and environmental

degradation, creating a complex interaction where ecological and socio-economic vulnerabilities intertwine. For instance, tourism can detract from local livelihoods by restricting access to natural resources that communities traditionally rely upon, a phenomenon that has been documented in various regions, such as in Kenya, where eco-tourism enterprises hinder local access to grazing lands and water resources (Wishitemi et al., 2015). Case studies highlight the dynamic relationship between poverty and environmental degradation; for example, research demonstrates that impoverished areas often experience a "downward spiral," wherein poverty leads to resource depletion, which in turn perpetuates poverty (Su-lan et al., 2020). Additionally, the imposition of conservation measures can further alienate local populations, denying them economic benefits while expecting them to abide by resource management directives without receiving sustainable support (Kassa et al., 2018). Furthermore, comprehensive evaluations show that successful poverty alleviation strategies must integrate ecological sustainability to create mutually beneficial outcomes for both local communities and environmental health (Bing et al., 2019).

Therefore, addressing the challenges faced by coastal communities like those in Pangandaran requires a holistic approach that fosters genuine participation of local populations in tourism development. Enhancing the connection between environmental stewardship and local economic benefits is essential to close the gap between ecological health and community well-being, ultimately leading to sustainable development in coastal zones. Marine ecotourism can serve as an effective strategy for community-based development, particularly in coastal regions facing socio-economic and environmental challenges. Unlike mass tourism, which often focuses on short-term profits and can lead to local exploitation, marine ecotourism emphasizes sustainability, ecological education, and the active involvement of local communities. This focus creates opportunities for diversifying income, preserving cultural heritage, and bolstering community resilience against socio-environmental stressors.

Successful implementation of marine ecotourism has been shown to yield economic benefits while promoting conservation efforts. For instance, the model of synergistic sustainable marine ecotourism practiced in Pangandaran demonstrates how local community engagement leads to enhanced stewardship of natural resources while simultaneously providing financial returns to community members Nurhayati et al. (2018) Nurhayati et

al., 2019). Furthermore, community-based approaches to ecotourism have been associated with increased local participation in management decisions and more equitable benefit-sharing among stakeholders (Yasir, 2019; "The Role of Ecotourism in the Social and Economic Field", 2022). However, multiple studies indicate that inclusivity is crucial; without proper planning that incorporates local voices, marine ecotourism projects can inadvertently reinforce existing inequalities and dependency dynamics (Kumar et al., 2023). Evidence also highlights that lack of community involvement can lead to social disruption and reduced effectiveness of conservation efforts, overshadowing the potential benefits (Bhatta, 2023; Riniwati et al., 2019).

Therefore, while marine ecotourism presents a viable pathway for sustainable development in coastal communities, it necessitates a commitment to inclusive planning and community engagement. Addressing the identified gaps in participation and power dynamics is essential to ensure that local communities not only benefit from ecotourism but also play an active role in shaping and managing these initiatives for long-term socio-economic and environmental sustainability.

### *1.2 Theoretical Framework and Conceptual Orientation*

Marine ecotourism can serve as an effective strategy for community-based development, particularly in coastal regions facing socio-economic and environmental challenges. Unlike mass tourism, which often focuses on short-term profits and can lead to local exploitation, marine ecotourism emphasizes sustainability, ecological education, and the active involvement of local communities. This focus creates opportunities for diversifying income, preserving cultural heritage, and bolstering community resilience against socio-environmental stressors. Successful implementation of marine ecotourism has been shown to yield economic benefits while promoting conservation efforts. For instance, the model of synergistic sustainable marine ecotourism practiced in Pangandaran demonstrates how local community engagement leads to enhanced stewardship of natural resources while simultaneously providing financial returns to community members (Nurhayati et al., 2018; Nurhayati et al., 2019). Furthermore, community-based approaches to ecotourism have been associated with increased local participation in management decisions and more equitable benefit-sharing among stakeholders (Yasir, 2019; "The Role of Ecotourism in the Social and Economic Field", 2022). However, multiple studies indicate that inclusivity is crucial; without proper planning that incorporates local voices, marine

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The AGIL framework suggests that for a society to function effectively, it must perform key functions that allow for stability and resilience. By applying this framework to marine ecotourism, we can analyze how communities adapt to economic opportunities, such as ecotourism, while ensuring their cultural values and local knowledge are preserved. Merton's distinction between manifest and latent functions highlights potential hidden social capital within these communities, such as solidarity and cooperative systems, which can enhance participatory tourism development. Existing literature supports the application of the AGIL framework in analyzing community dynamics in ecotourism contexts. Yasir discusses the necessity of local participation in the development of ecotourism, emphasizing that community input is crucial for enhancing adaptation and fostering economic viability within mangrove ecotourism in Indonesia Yasir (2019). Porter et al. reveal that meaningful stakeholder participation in community meetings is often obstructed, indicating that achieving integration and goal attainment in tourism projects is ineffective unless local voices are fully engaged (Porter et al., 2015). Furthermore, Lee et al. provide evidence that classifying ecotourism sites by stakeholder subjectivities facilitates better planning, which can enhance collaboration and decision-making processes (Lee et al., 2017). Both frameworks reinforce that leveraging local community dynamics and existing social networks can maximize the benefits of ecotourism

projects while ensuring the cultural patterns of these communities are preserved.

Thus, viewing marine ecotourism through the lens of Parsons' AGIL scheme, complemented by Merton's concepts of manifest and latent functions, offers insights into how these initiatives can build community resilience and promote sustainable development. This sociological perspective emphasizes the need for inclusive planning that recognizes and integrates local knowledge and values, transforming ecotourism from an economic tool into a meaningful social intervention that reshapes local institutions and capacities.

### *1.3 Literature Review and Related Works*

Marine ecotourism serves as a pathway for economic diversification, environmental conservation, and community development in Indonesia, particularly through community involvement. Engaging local communities in ecotourism initiatives can potentially improve household income, foster environmental stewardship, and strengthen local identity. This is essential for ensuring that the benefits of ecotourism are equitably distributed, thereby aligning economic incentives with ecological sustainability and cultural preservation.

Studies in various parts of Indonesia support these benefits. For example, (Zamzami et al., 2021) discuss how local community involvement in ecotourism positively influences economic enhancement while contributing to marine conservation (Zamzami et al., 2021). Additionally, (Nurhayati et al., 2018) note that when communities are engaged in ecotourism activities, they are likely to take better care of their environments, leading to improved conservation outcomes (Nurhayati et al., 2018). However, the success of these initiatives is contingent upon supportive policy frameworks and community readiness, as well as necessary infrastructure development (Hsiao et al., 2021; Olán-González et al., 2023). Furthermore, (Muslim, 2021) emphasizes that well-aligned ecotourism strategies incorporating local cultural values can enhance community resilience and promote sustainable resource use (Muslim, 2021).

Therefore, while marine ecotourism has the potential to bolster economic and environmental objectives, its effectiveness heavily relies on comprehensive support systems that promote community readiness and inclusive governance. In this way, marine ecotourism can be seen not just as

an economic tool, but as a viable strategy for holistic community empowerment and sustainability.

Globally, Bramwell & Lane (1993) emphasize that sustainable tourism must be planned as a holistic process that considers ecological, economic, and cultural dimensions. Narimah et al. (2022) found that in small islands and coastal villages, tourism can either empower or marginalize local residents depending on their involvement in planning and implementation. Lasso & Dahles (2018) warn that without community control, tourism development can lead to cultural commodification and environmental degradation. In the context of coastal resilience, marine ecotourism presents an opportunity to enhance the adaptive capacity of coastal communities in Pangandaran by promoting social cohesion, leveraging local knowledge, and fostering institutional flexibility.

Cinner & Barnes (2019) emphasize that for coastal communities facing ecological threats, social cohesion and the utilization of local knowledge systems are crucial for building resilience. Engaging communities in a participatory ecotourism framework can facilitate these aspects, allowing them to actively contribute to environmental stewardship while also improving their livelihoods. However, successful implementation hinges on local readiness and supportive policies. Research indicates that when communities are actively involved in marine ecotourism, there are notable improvements in environmental management and local economic development. For instance, studies such as those by Nurhayati et al. highlight how synergistic sustainable marine ecotourism can strengthen local identity and enhance household incomes through community-engaged practices (Nurhayati et al., 2019). Despite these opportunities, there remains a scarcity of research specifically addressing local communities' roles in the tourism plans currently promoted at a regional level (Nurhayati et al., 2019). This gap signifies a need for further exploration into how community involvement in tourism planning can afford meaningful benefits to coastal residents in Pangandaran, thereby counteracting top-down approaches that have previously marginalized local voices (Musleh et al., 2023). Thus, utilizing a functionalist sociological perspective, this study aims to explore the empowerment of Pangandaran's coastal communities through marine ecotourism as a strategic approach. By focusing on participatory tourism development, it seeks to enhance social cohesion and local knowledge

integration, ultimately fostering ecological resilience and community capacity amidst the challenges faced in coastal environments.

#### *1.4 Problematization and Research Gap*

Despite decades of tourism development in Pangandaran, the socio-economic conditions for many coastal residents remain stagnant, with tourism revenues primarily benefiting large investors rather than local marginalized groups such as small-scale fishers, seaweed farmers, and women-led microenterprises. The disproportionate distribution of tourism benefits highlights systemic economic inequalities within the community. Many local residents do not experience the promised economic uplift from tourism programs, which raises important questions regarding the overall effectiveness of tourism as a pathway for community development. Moreover, tourism can sometimes exacerbate vulnerabilities in the face of external shocks, such as climate change and market volatility.

Research conducted by Nazirullah et al. indicates that community values significantly influence support for tourism development and that perceived socio-cultural and economic impacts can reinforce community ties; however, few local initiatives adequately address the needs of marginalized groups (Nazirullah et al., 2023). Hampton et al. argue that coastal tourism dynamics often create new class antagonisms and neglect the socio-economic conditions of those reliant on small-scale livelihoods, providing a relevant context for issues faced by local communities engaged in tourism (Hampton et al., 2023). Existing studies on coastal communities, including Pangandaran, indicate a lack of research focused specifically on how tourism programs contribute to or hinder community resilience strategies amid socio-cultural erosion and market instability, emphasizing a need for critical assessment in light of these factors (Hampton et al., 2023). This gap highlights the interplay between tourism development and community empowerment, particularly for vulnerable populations (Woo et al., 2015).

Therefore, it is crucial to rethink tourism development strategies in Pangandaran to ensure they inclusively empower local communities and address persistent inequalities. Focusing on equitable distribution of tourism benefits and engaging marginalized groups in decision-making are essential steps toward fostering genuine community resilience and sustainability in the face of environmental and economic challenges. A major limitation in existing development models is the lack of integration between tourism planning and

local knowledge systems. Top-down planning often ignores informal social structures—such as fishing cooperatives, local traditions, or communal land-use practices—that form the backbone of coastal communities' resilience strategies. The need for a functionally grounded, community-centered framework is thus urgent and timely. Moreover, most studies treat ecotourism as either a conservation or economic issue. This paper seeks to bridge both perspectives while situating tourism development within the broader context of community empowerment, social structure transformation, and resilience-building.

### *1.5 Definitions and Key Concepts*

Marine ecotourism is defined as environmentally responsible travel to coastal and marine areas aimed at conserving the environment, sustaining the well-being of local communities, and involving educational elements; it serves as a potential framework for enhancing community resilience. Community resilience encompasses the capacity of coastal populations to absorb, adapt to, and recover from socio-economic and environmental shocks while maintaining their core identity and cultural functions. This includes enhancing physical and economic readiness, promoting social cohesion, localized knowledge systems, and the adaptability of institutions. By engaging local communities in active participation in ecotourism, the model can be leveraged to bolster these dimensions of resilience, which are critical given the environmental pressures faced by coastal communities.

Research by Nurhayati et al. indicates that when coastal tourism is developed synergistically, it has the potential to improve local livelihoods through economic benefits while ensuring the sustainability of the natural resources upon which these communities depend Nurhayati et al. (2018). Similarly, Hsiao et al. emphasize the importance of maintaining marine environmental resources as a critical success factor in tourism, noting that the protection of these resources positively impacts both tourism and community welfare (Hsiao et al., 2021). The connection between these factors illustrates how effective engagement and empowerment within marine ecotourism frameworks can enhance the adaptive capacity of coastal communities.

In conclusion, marine ecotourism represents a valuable opportunity for fostering community resilience in coastal areas by integrating social, economic, and environmental considerations into its development. By

promoting active participation and support for local communities, marine ecotourism fosters a collective response to the ecological and socio-economic challenges faced by coastal populations, thereby ensuring their sustainability and well-being. In this study, empowerment is conceptualized as both a process and an outcome, where communities gain increased control over decisions, resources, and institutions that shape their lives, spanning economic, social, psychological, and political dimensions.

Empowerment is crucial because it enables communities to navigate the complexities of their socio-economic environments effectively. Understanding empowerment through these dimensions allows for a comprehensive analysis of how communities can improve their overall well-being and make informed decisions that enhance their capacities. This aligns well with a functional approach, which investigates how different components of a social system contribute to its maintenance and evolution. Numerous studies illustrate the significance of empowerment in enhancing community resilience and development. For instance, Waridin et al. (2018) assert that community empowerment significantly influences rural infrastructure development and can yield substantial economic benefits when combined with participatory governance. Similarly, research by Khalid et al. (2019) emphasizes that community support is a critical mediator in the relationship between empowerment and sustainable tourism development, underpinning the importance of local involvement in tourism initiatives to foster sustainable practices. However, there is little research examining the specifics of these relationships directly on health outcomes within food systems, as highlighted by (Burkhart et al., 2022), which focuses on challenges in school food programs rather than community empowerment broadly.

Thus, this paper aims to critically examine the manifest and latent functions of ecotourism through the lens of empowerment, revealing how informal community practices can either support or hinder sustainable development. By foregrounding the importance of community control and involvement, the study seeks to illuminate pathways toward effective empowerment strategies that ensure sustainable development aligns with local needs and capacities.

### *1.6 Research Objectives and Contributions*

This paper seeks to:

1. **Examine** the existing socio-economic and environmental conditions of coastal communities in Pangandaran.
2. **Analyze** how marine ecotourism can functionally contribute to community resilience and empowerment.
3. **Identify** the roles of stakeholders, institutions, and traditional knowledge in shaping participatory marine tourism.
4. **Propose** recommendations for integrated and inclusive ecotourism planning in similar coastal contexts.

This research contributes to the literature on community-based ecotourism, participatory development, and social transformation in coastal regions by integrating empirical fieldwork with theoretical perspectives, providing valuable insights for policymakers and community leaders involved in sustainable tourism initiatives. By grounding the study in both fieldwork and theory, the research captures the multifaceted impacts of ecotourism on local communities and environments. It emphasizes the importance of community participation in tourism development, which can lead to more sustainable practices that directly benefit local populations. Understanding these dynamics is crucial for policymakers and NGOs as they seek to foster resilience and empower communities facing socio-economic and environmental challenges.

Research by Zuhri and Rosalina indicates that community-based ecotourism (CBE) actively engages local residents, positioning them as crucial stakeholders in the preservation of their environment and culture, aligning with their needs and aspirations Zuhri & Rosalina (2024). Additionally, Hengky evaluates the challenges faced by sustainable coastal tourism initiatives, highlighting the necessity for increased community involvement to mitigate the negative impacts of external pressures on local ecosystems (Hengky, 2019). Annas et al. underscore the critical role of community participation in managing ecotourism, asserting that without it, sustainability efforts are likely to fail (Annas et al., 2024). This body of empirical evidence illustrates that effective community engagement is fundamental to achieving successful outcomes in ecotourism.

Therefore, this study not only fills existing gaps in the literature on the socio-economic implications of ecotourism in coastal settings but also offers practical insights for those involved in policy and community leadership. By focusing on empowerment and participatory practices, stakeholders can

better achieve sustainable tourism and coastal development, ensuring that the benefits of ecotourism are equitably distributed among local communities.

### *1.7 Structure of the Paper*

The remainder of this paper is structured as follows:

1. **Section 2: Methodology** describes the research design, data collection techniques, and analytical framework.
2. **Section 3: Results and Discussion** presents the empirical findings from Pangandaran, organized thematically based on the AGIL framework and community empowerment dimensions.
3. **Section 4: Conclusion and Recommendations** summarizes key insights and outlines practical implications for policy and future research.

### *1.8 Summary and Significance*

In summary, this paper positions marine ecotourism not only as an economic strategy but as a **transformative social intervention** that engages with the cultural, ecological, and institutional fabric of coastal communities. By applying a functional approach, it emphasizes the importance of interdependence between tourism, local resilience, and social structures. It advocates for a shift from top-down, extractive tourism models to inclusive, community-driven development that enhances both human and environmental well-being.

Given the strategic importance of Pangandaran for marine tourism and its relevance to national coastal resilience strategies, the findings of this research are expected to have implications that extend beyond local applications—contributing to broader debates on sustainability, empowerment, and place-based development in the Global South.

## **Methods**

### *2.1 Research Design*

This study employed a **qualitative case study design** to explore the dynamics of community resilience and empowerment through marine ecotourism in a coastal village in Pangandaran, West Java. The qualitative approach was chosen to gain in-depth insights into social structures, cultural

values, local participation, and stakeholder interactions that shape the development of community-based marine tourism.

The case study focused on one coastal village that has initiated ecotourism programs involving local residents, tourism groups, and government partnerships. The use of a single-case design allowed for a contextualized and holistic analysis of the phenomena, while enabling flexibility in data collection and interpretation.

## *2.2 Research Setting, Duration, and Researcher Presence*

The research was conducted in **Wonoharjo Village**, one of the coastal areas in the Pangandaran Regency known for its growing marine tourism activities. The study was carried out over a period of **three months**, from **June to August 2024**. During this time, the researcher was **present on-site** for participant observation, field immersion, and engagement with local actors.

The presence of the researcher involved direct participation in community meetings, informal gatherings, and ecotourism activities such as guiding, homestay visits, and coastal clean-ups. This immersive approach allowed for the collection of rich ethnographic data and the building of trust with key informants.

## *2.3 Population and Sample*

The population of this study consists of individuals and groups involved in or affected by marine ecotourism development in the research village. The **sampling technique** used was **purposive sampling**, focusing on those with relevant knowledge, experience, or roles in the community.

The **sample** included:

- **10 key informants**, comprising village leaders, POKDARWIS (Tourism Awareness Group) members, and local tourism entrepreneurs.
- **6 traditional fishers** and **3 seaweed farmers** who were directly impacted by marine-based livelihoods.
- **5 women participants** involved in local food processing and homestay management.
- **2 representatives** from local government and tourism agencies.
- **1 NGO facilitator** supporting sustainable tourism in the region.

This diverse sample was designed to capture multiple perspectives on ecotourism development and its socio-economic impacts.

#### 2.4 Data Collection Techniques and Instruments

The data were collected using the following techniques:

1. **In-depth interviews:** Semi-structured interview guides were developed to explore themes related to community resilience, tourism participation, local values, and stakeholder collaboration. Interviews were conducted in Bahasa Indonesia and recorded with participants' consent.
2. **Focus group discussions (FGDs):** Two FGDs were held, each involving 6–8 participants from different community segments, to discuss shared experiences and collective views on marine ecotourism.
3. **Participant observation:** The researcher observed daily community activities, tourism events, group meetings, and local economic interactions to document behavioral patterns and informal practices.
4. **Document review:** Relevant documents such as village development plans, tourism maps, and community group reports were analyzed to triangulate primary data.

No digital instruments or laboratory tools were used, as the study relied on qualitative field methods. Audio recorders and field notebooks were used for data documentation.

#### 2.5 Data Analysis Techniques

Data analysis was conducted through a **thematic content analysis** approach, guided by the functional sociology framework (Parsons and Merton). The steps included:

1. **Data familiarization** through repeated reading of transcripts and field notes.
2. **Coding** using inductive and deductive categories (e.g., adaptation, goal attainment, integration, latent functions).
3. **Theme development** based on recurring patterns in community experiences and institutional practices.
4. **Interpretation** of themes in relation to theoretical concepts and research objectives.

The use of functional theory allowed the researcher to analyze how various community components—such as local institutions, values, and informal networks—serve adaptive and integrative functions in ecotourism development.

## 2.6 *Validity and Trustworthiness*

To ensure the **validity and credibility** of the research findings, several strategies were employed:

1. **Triangulation** of data sources (interviews, FGDs, observations, and documents) to cross-verify information.
2. **Member checking**, whereby selected informants reviewed interview transcripts and emerging findings to ensure accuracy.
3. **Prolonged engagement** in the field to build rapport and observe authentic social dynamics.
4. **Peer debriefing** with fellow researchers to test the coherence and neutrality of interpretations.

These measures were taken to enhance the **trustworthiness** of the research, particularly in ensuring that the voices of marginalized and vulnerable community members were accurately captured.

## Results

### 3.1 *Overview of Pangandaran's Coastal Community Context*

Pangandaran's coastal villages are characterized by a unique intersection of marine biodiversity, traditional livelihoods, and expanding tourism potential. The community in **Wonoharjo Village**, the focal site of this study, primarily consists of traditional fishers, seaweed farmers, small-scale traders, and a growing number of tourism actors operating homestays and offering guiding services.

Over the past decade, tourism has become a significant sector in the local economy, yet most local actors remain on the margins of formal planning and benefit-sharing mechanisms. Field observations reveal an uneven distribution of tourism gains, with local communities still largely dependent on declining marine resources and seasonal tourist inflows.

This section presents the findings organized thematically, drawing on the functionalist framework of AGIL (Adaptation, Goal attainment, Integration, Latency) to understand how various dimensions of community life contribute to resilience building through marine ecotourism.

### 3.2 Adaptation: Livelihood Diversification and Ecotourism Initiatives

#### 3.2.1 Shifting Economic Practices

Marine ecotourism has introduced alternative income opportunities for the residents of Wonoharjo Village. In addition to traditional fishing and aquaculture, locals are increasingly involved in:

1. Operating **homestays** for domestic tourists.
2. Offering **boat tours**, snorkeling, and mangrove walks.
3. Selling **handicrafts and local culinary products** (e.g., salted fish, seaweed crackers).

These shifts demonstrate how communities adapt to changing environmental and economic conditions.

“Now we rely less on fish catch. When the sea is rough, tourists still come. It gives us a backup.” (Male homestay operator, age 45)

#### 3.2.2 Seasonal Vulnerabilities and Risk Management

While tourism offers diversification, it is still susceptible to seasonal fluctuations and external shocks (e.g., COVID-19, climate-induced storms). Community members indicated that without adequate infrastructure and marketing support, they risk becoming equally dependent on tourism as they were on fishing.

Table 1. Comparison of Average Monthly Income Sources (2023)

Source of Income	Peak Season (IDR)	Off Season (IDR)
Fishing	2,500,000	1,200,000
Homestay	3,800,000	800,000
Guiding & Tours	2,200,000	500,000

Source of Income	Peak Season (IDR)	Off Season (IDR)
Seaweed Farming	1,500,000	1,500,000

### 3.3 Goal Attainment: Institutional Support and Community Aspirations

#### 3.3.1 Role of POKDARWIS (Tourism Awareness Group)

POKDARWIS has emerged as a key institution in coordinating community-based tourism. Through collective meetings, training, and partnerships with NGOs, the group has initiated several ecotourism programs, including:

- Ecotourism trail development
- Waste management initiatives
- Coral reef education sessions

“We want tourism that benefits everyone, not just outsiders. That’s our goal in this group.” (Chair of POKDARWIS, age 36)

#### 3.3.2 Alignment with Village Development Goals

Community aspirations in Pangandaran are increasingly aligned with sustainability-oriented village development plans, where tourism is now recognized not only as a source of income but also as a platform for education, cultural revitalization, and environmental awareness.

This shift in perspective reflects a growing recognition among communities that sustainable tourism can facilitate holistic development, enhancing quality of life while ensuring the preservation of local culture and environmental resources. By integrating educational initiatives and cultural activities into tourism, communities can foster a stronger sense of identity and environmental stewardship.

Research by Nofrion et al. demonstrates that community-based tourism initiatives empower local residents, allowing them to take an active role in decision-making processes that affect their livelihoods and surroundings Nofrion et al. (2023). Furthermore, Sitorus et al. highlight that with proper planning, tourist villages can enhance community quality of life by providing employment opportunities through sustainable tourism (Sitorus et al., 2023). This supports the notion that community engagement in tourism contributes to both economic benefits and ecological conservation. Additionally,

Hermawan et al. discuss the importance of community-based local wisdom in tourism development, emphasizing that sustainable tourism can help maintain cultural values and contribute to the achievement of Sustainable Development Goals (Hermawan et al., 2024).

Therefore, aligning community aspirations with sustainability-oriented tourism development not only drives economic growth but also enhances cultural integrity and environmental consciousness. By fostering education and cultural revitalization through tourism, Pangandaran can cultivate resilient communities that actively participate in preserving their unique identities and natural resources while adapting to global sustainability standards.

However, informants noted a lack of **technical assistance** and **marketing skills** that limits their ability to reach wider markets and upscale ecotourism services.

Figure 1. Diagram of Community Tourism Goals and Stakeholder Alignment

(a) Community goals: income diversification, cultural preservation, clean environment

(b) Stakeholders: POKDARWIS, village government, NGOs, youth groups

### *3.4 Integration: Social Cohesion and Collective Action*

#### *3.4.1 Strengthening Social Networks*

The emergence of marine ecotourism has facilitated greater cooperation among villagers. Women's groups manage food stalls, youth organize beach clean-ups, and fishers share boats for tourist trips. These actions represent enhanced **horizontal integration**.

"Tourism makes us work together more. Before, each person focused only on their own fishing net." (Female fish processor, age 42)

Community members also organize "**gotong royong**" (communal work) sessions to maintain the beach and mangrove areas, reviving traditional cooperation practices that had declined due to competition over marine resources.

#### *3.4.2 Bridging External Relations*

The involvement of NGOs and universities has been instrumental in promoting initiatives such as waste segregation, mangrove replanting, and

marketing training in coastal communities; however, relationships with government actors often remain weak, characterized by bureaucratic hurdles, particularly in accessing funds for tourism development.

Effective collaboration with external partners like NGOs and academic institutions can provide crucial resources and knowledge, enabling communities to implement sustainable practices successfully. These efforts are essential for fostering environmental conservation and economic development. Conversely, weak ties with government entities can hinder progress, as bureaucratic complexities may obstruct access to necessary funding and support, limiting the potential benefits of tourism initiatives.

Research by Apdillah et al. highlights the collaboration between communities and external stakeholders in enhancing mangrove management and ecotourism development, indicating that such partnerships can promote both environmental sustainability and improved local livelihoods Apdillah et al. (2023). Additionally, Ulfa and Harahap point out that while there is a high potential for tourism in mangrove areas, the development of infrastructure and quality improvements in tourism facilities are necessary to enhance visitor experiences and conservation efforts (Ulfa & Harahap, 2022). However, Tjong et al. emphasize that without sufficient engagement from government bodies, community-led mangrove rehabilitation programs may lack the necessary support for success, highlighting the importance of enhanced governmental relations to secure adequate funding and resources for local initiatives (Tjong et al., 2021).

Therefore, while linkages with NGOs and universities are critical for fostering community-led environmental initiatives, strengthening relationships with government actors is essential for overcoming bureaucratic barriers. Improving these connections will enable more effective access to tourism development funds, ultimately promoting sustainable practices and enhancing the resilience of coastal communities through comprehensive support networks.

Table 2. Types of Community Partnerships in Ecotourism Activities

Partner Type	Contribution	Status
Local NGOs	Training and facilitation	Active

Partner Type	Contribution	Status
Universities	Research, community service programs	Intermittent
District Government	Infrastructure and licensing	Limited engagement
Private sector (hotels)	Resource support (donations)	Informal

### 3.5 Latency: Cultural Preservation and Value Transmission

#### 3.5.1 Reviving Maritime Identity

Marine ecotourism has contributed to the revival of Pangandaran's **maritime cultural identity**. Traditional fishing stories, boat designs, and culinary knowledge are now featured in tourist narratives and events, such as the annual **Sea Alms Festival (Sedekah Laut)**.

“Tourists want to know our stories. We are proud to share them now.”  
(Youth guide, age 27)

These expressions of cultural pride serve a latent function—rebuilding community morale and intergenerational continuity.

#### 3.5.2 Youth Engagement and Informal Learning

Young people in Wonoharjo are increasingly engaged in roles related to guiding, digital marketing, and providing English-language services, which not only fosters their skills but also revitalizes their interest in local history and ecology through tourism.

As the local tourism industry expands, it presents opportunities for youth to acquire essential soft skills that are increasingly valuable in the modern job market. Participation in guiding and providing services that leverage digital marketing and English language skills encourages a deeper understanding and appreciation of their community's cultural and ecological heritage.

Research by Maudiarti and Adriani highlights the significance of community engagement in tourism development, emphasizing that young individuals who participate in tourism activities often become more knowledgeable about their locality and its historical context Maudiarti & Adriani (2021). Furthermore, Rumanti et al. address the role of educational tourism in building competencies among youth, suggesting that involvement in tourism can enhance their understanding of environmental and cultural matters, thereby contributing to community empowerment and sustainable tourism practices (Rumanti et al., 2024). Additionally, Ashokkumar and Sangeetha propose that community participation in tourism enhances the sustainability of tourism practices by encouraging local populations to share their cultural heritage with visitors, reinforcing their connection to their environment (Ashokkumar & Sangeetha, 2024).

Therefore, the active involvement of young people in tourism-related activities in Wonoharjo serves as a powerful catalyst for personal and community development. By equipping them with vital skills and fostering a renewed interest in local history and ecology, tourism can effectively contribute to the empowerment of youth and the sustainable growth of the community as a whole. However, challenges remain in ensuring consistent youth participation due to migration pressures and the allure of urban employment.

### *3.6 Constraints and Observed Challenges*

Despite the benefits of marine ecotourism, several challenges constrain its effectiveness:

1. **Infrastructure gaps** – such as waste disposal, sanitation, and road access limit scalability.
2. **Lack of long-term investment** – financial sustainability of community initiatives remains a concern.
3. **Knowledge gaps** – many community members lack formal training in business management, digital marketing, or ecotourism standards.
4. **Gendered participation** – while women are active in food production, they are underrepresented in leadership roles.
5. **Fragmented governance** – overlapping roles between village and district institutions create confusion in tourism regulation.

“Sometimes we are asked to fill too many forms, but no funding comes. It discourages us.” (Tourism group secretary)

### *3.7 Summary of Results and Theoretical Reflection*

This study shows that marine ecotourism in Pangandaran serves **multiple functions**:

1. As **adaptation**, it offers alternative livelihoods.
2. As **goal attainment**, it facilitates shared visioning through POKDARWIS.
3. As **integration**, it strengthens social cohesion and partnerships.
4. As **latency**, it supports cultural identity and intergenerational transmission.

These findings validate the relevance of a **functionalist sociological lens** in assessing how marine ecotourism contributes to resilience—not only economically but also socially and institutionally.

## **Discussion**

### *4.1 Marine Ecotourism as an Adaptive Strategy for Coastal Resilience*

The findings of this study indicate that marine ecotourism serves as an effective platform for livelihood diversification and enhancing adaptive resilience among coastal communities in Pangandaran. Utilizing Parsons' adaptation function, the integration of ecotourism provides communities with strategies to respond to challenges such as declining marine resources, climate variability, and economic volatility. By offering alternative income sources and innovative employment models, communities can diversify their economic activities beyond traditional fisheries.

As emphasized by Roscher et al., diversification in livelihoods is critical for coastal communities aiming to sustain their economic well-being Roscher et al. (2022). In Pangandaran, local actors have increasingly engaged in homestays, tour guiding, and small-scale culinary businesses, thereby expanding the economic base and decreasing dependency on fishing. Furthermore, though it is evident that marine ecotourism can contribute to increased resilience, current references do not directly support the specific

assertion that communities adopting marine ecotourism practices have significantly improved their resilience to environmental changes. While greater social capital and collaboration in tourism is mentioned by various studies, it is not clearly linked to the specific practices or results observed in Pangandaran (Devlin et al., 2019; Noor et al., 2022; Hewitt et al., 2016).

Therefore, by leveraging marine ecotourism as a strategy for livelihood diversification, coastal communities in Pangandaran can enhance their adaptive capacity and resilience. This framework not only supports economic stability but also fosters local cultural identity, making communities more robust against future ecological and economic challenges. The findings of this study support the argument posited by Cinner et al. (2018) regarding the necessity of adaptive strategies for coastal zones that are vulnerable to environmental and market shocks.

Effective adaptation in these regions relies not only on external interventions but also on the internal social capital, local institutions, and the community's capability to manage change. The unique challenges posed by seasonal risks and infrastructure constraints—such as inadequate waste management and limited marketing capabilities—highlight that adaptation through ecotourism remains only partial and precarious.

Cinner et al. (2018) emphasize that adaptive strategies are crucial for coastal communities facing ecological and economic uncertainties, highlighting how resilience is multifaceted and requires diverse approaches Louisor et al. (2022). However, Dahles & Susilowati (2015) were not found to directly support the claims regarding community engagement and local governance in this context, nor is there sufficient evidence to back their relevance as cited. Furthermore, the reference by Spalding et al. (2014) was not evaluated in this context due to lack of direct applicability to the arguments made. The potential implementation of marine ecotourism illustrates the need for comprehensive integration with long-term coastal development strategies to enhance overall resilience.

Therefore, while marine ecotourism offers a foundational strategy for promoting adaptability and resilience, it is essential that these initiatives are complemented by strengthened local governance and strategic planning. By addressing the internal capacities of communities along with external support, the potential for sustainable and effective adaptation increases,

ensuring that coastal communities can better withstand and thrive amid future environmental and economic challenges

#### *4.2 Institutional Function and Goal Attainment in Ecotourism Development*

The study emphasizes the crucial role of POKDARWIS (Tourism Awareness Groups) as functional agents in directing local tourism development, which aligns with Parsons' goal attainment function. POKDARWIS facilitates community-driven goals by organizing capacity-building workshops, creating tourism packages, and advocating for local initiatives. This proactive engagement helps align the aspirations of the community with tangible development objectives, fostering sustainable tourism practices.

Research by Mistriani et al. highlights the importance of POKDARWIS in successfully managing tourism initiatives, demonstrating how these groups can enhance agricultural systems and community engagement in rural tourism Mistriani et al. (2024). Furthermore, Umam et al. emphasize that groups like POKDARWIS Capung Alas guide the community in developing tourism potential through participatory strategies, showing that such organizational structures can effectively mobilize local resources and capacities (UMAM et al., 2022). Similarly, Wibisono et al. explain that POKDARWIS plays a significant role in governing tourism development, allowing local communities to influence their tourism trajectories and ensure that their needs are reflected in development efforts (Wibisono et al., 2024).

Therefore, POKDARWIS serves as a vital mechanism for bringing together community members to shape sustainable tourism development. By functioning as an intermediary between local aspirations and development goals, these groups help create a more integrated approach to tourism that benefits both the economy and the community's cultural integrity.

This resonates with findings from **Sofield (2003)** and **Cole (2006)**, who argue that local institutions must not only represent community voices but also act as mediators between grassroots actors and higher-level authorities. In Pangandaran, however, the institutional interface between POKDARWIS and government tourism agencies remains inconsistent. Bureaucratic barriers and lack of access to formal financing channels limit the group's ability to scale up.

Interestingly, while community members express strong **collective goals**—such as sustainable development and environmental conservation—the tools and resources to realize those goals are often externalized. This reflects the structural-functional critique by **Merton (1968)**, who points to the dysfunctions that arise when institutional structures are not adequately supported or are mismatched with social needs.

Moreover, the community's emerging awareness of environmental sustainability reflects a growing **civic consciousness**, as proposed by **Pretty (1995)** in his typology of community participation. In this context, ecotourism is not only a livelihood strategy but also a mechanism to articulate shared visions of the future.

### *4.3 Integration through Social Cohesion and Multi-Stakeholder Collaboration*

The findings indicate that ecotourism has significantly enhanced social cohesion and collective action within coastal communities in Pangandaran, fulfilling the integration function of Parsons' AGIL framework.

The promotion of collaborative behaviors among community members across different age, gender, and occupational lines through tourism activities illustrates the effectiveness of ecotourism in bringing people together. This is particularly evident in initiatives such as mangrove replanting, coastal cleanup campaigns, and the development of tourism packages, which foster strong social ties and a sense of community identity.

Research by Auliah et al. highlights how social capital and collective action are foundational to the development of sustainable tourism Auliah et al. (2024). Similar studies indicate that successful ecotourism initiatives rely on community involvement, which cultivates a sense of ownership and shared responsibility for local resources. Lee and Jan also emphasize the importance of integrating collective behaviors in promoting ecotourism, suggesting that these actions positively influence both community dynamics and environmental outcomes (Lee & Jan, 2017). The collaborative initiatives noted in Pangandaran reinforce the idea that tourism can serve as a catalyst for social integration, thereby enhancing community resilience.

This study underscores the importance of ecotourism not only as an economic activity but also as a means of enhancing social cohesion and fostering collective action. By facilitating collaboration among diverse

community members, ecotourism contributes to the overall integration and resilience of coastal communities, aligning with Parsons' AGIL framework. This reflects the findings of **Scheyvens (1999)**, who emphasizes that empowerment must include social and institutional dimensions, not just economic gains. In the Pangandaran case, ecotourism has facilitated informal institutions (e.g., gotong royong, youth groups, rotating savings clubs) to work alongside formal tourism bodies, thus enhancing community-wide integration.

However, challenges remain in **bridging vertical integration** between local actors and district-level tourism authorities. While some NGOs and universities provide intermittent support, these linkages are often project-based and lack long-term commitment. **Goodwin & Santilli (2009)** note that without sustained partnerships, community-based tourism may struggle to maintain relevance in competitive tourism markets.

The importance of **horizontal and vertical integration** in building community resilience through ecotourism cannot be overstated. Communities that are socially cohesive yet institutionally disconnected face limitations in accessing markets, information, and policy support. Addressing this gap requires what **Ostrom (2005)** describes as polycentric governance—multiple centers of decision-making that are formally independent but functionally interdependent.

#### *4.4 Latency, Cultural Transmission, and the Role of Youth*

One of the most profound yet under-recognized impacts of marine ecotourism in Pangandaran lies in the **revitalization of cultural identity and intergenerational learning**—the **latency function** of AGIL. Activities such as sea alms festivals, traditional storytelling, and boat-making demonstrations have found new relevance through ecotourism narratives. This corresponds with **Salazar (2012)** and **Long & Wall (1996)**, who emphasize tourism's potential to valorize cultural expressions, particularly in marginalized or peripheral communities. In Pangandaran, youth participation in tourism-related roles has led to informal learning about local history, maritime ecology, and cultural rituals that were previously considered obsolete.

Youth involvement in digital marketing and foreign language services also illustrates a merging of traditional knowledge with modern competencies. However, the sustainability of this trend depends on the creation of structured **training, mentorship, and incentives**. Without such support, rural

youth may migrate to urban areas, risking a **loss of social reproduction**, as noted by **Bourdieu (1990)**.

Ecotourism, therefore, serves a latent yet vital function by renewing local identity, enhancing community pride, and providing pathways for **cultural continuity**—essential for long-term resilience.

#### *4.5 Challenges, Constraints, and Functional Dysfunctions*

While the study underscores the functional benefits of marine ecotourism, it also reveals several **dysfunctions** that hinder optimal impact. These include:

- **Infrastructure inadequacy**, especially in sanitation, transport, and digital connectivity.
- **Limited marketing skills**, which constrain local actors from reaching broader audiences.
- **Dependence on external agencies**, particularly for training and funding.
- **Gender disparity**, where women's contributions are significant in practice but undervalued in leadership and decision-making.

These findings echo critiques raised by **Mowforth & Munt (2016)**, who argue that even well-intentioned ecotourism projects can perpetuate inequalities and create new forms of dependency if not carefully managed.

Moreover, the study confirms that **resilience must be multi-dimensional**. Economic improvement alone cannot guarantee long-term sustainability unless accompanied by institutional development, cultural preservation, and inclusive governance. This reinforces the argument by **Adger (2000)** that social resilience is embedded in power relations, institutional arrangements, and knowledge systems.

#### *4.6 Broader Implications and Contributions to Theory and Practice*

This study contributes to both **academic theory** and **practical development discourse** in several ways:

##### **Theoretical contributions:**

- Demonstrates the relevance of the **functional sociology framework (AGIL)** in analyzing community-based tourism and empowerment.
- Highlights the importance of **latent social structures**, such as trust, cooperation, and cultural transmission, in resilience-building.

- Adds to the literature on **integrated coastal zone management**, with an emphasis on social institutions as central to sustainability.

#### **Practical implications:**

- Offers a **diagnostic tool** for assessing the functionality of community systems in tourism development.
- Provides recommendations for NGOs and policymakers to enhance **multi-stakeholder coordination, gender inclusion, and youth empowerment**.
- Suggests strategies for **resilience planning**, including capacity-building, institutional alignment, and monitoring systems.

By focusing on a specific case in **Pangandaran**, this study offers grounded insights that can inform community-based ecotourism initiatives in other parts of Indonesia and the Global South.

#### *4.7 Future Research Directions*

Several areas warrant further exploration:

1. **Comparative studies** across different coastal regions to identify patterns and local variations in ecotourism outcomes.
2. **Longitudinal research** to assess the long-term impacts of ecotourism on household income, youth retention, and ecosystem health.
3. **Quantitative studies** to complement the qualitative findings and provide broader generalizability.
4. **Policy analysis** to evaluate how government frameworks either support or constrain community-driven tourism.
5. **Participatory action research (PAR)** to co-produce knowledge with communities and implement adaptive solutions in real time.

## **Conclusion**

This study has examined how marine ecotourism functions as a tool for building coastal community resilience in Pangandaran, West Java. Employing a functional sociology framework (AGIL), we analyzed the multifaceted roles of ecotourism in enabling local communities to **adapt** to environmental and economic changes, **achieve collective goals, strengthen social cohesion**, and **preserve cultural identity**.

The findings show that:

1. **Adaptation** is visible through livelihood diversification, particularly among traditional fishers, women, and youth who have entered the ecotourism economy.
2. **Goal attainment** is facilitated by community institutions like POKDARWIS, although constrained by limited access to external resources and policy alignment.
3. **Integration** has improved through collective action and informal social networks that support cooperative tourism management and environmental stewardship.
4. **Latency** or cultural preservation is reactivated through tourism-based storytelling, festivals, and youth engagement in heritage-based tourism services.

These insights highlight the transformative potential of ecotourism—not merely as an economic alternative, but as a social intervention that strengthens adaptive capacity and identity in vulnerable coastal communities.

Nonetheless, the study also reveals structural limitations such as infrastructure gaps, limited institutional support, and gender disparities, which may hinder the long-term sustainability of community-based ecotourism if left unaddressed.

### *5.2 Recommendations for Practice*

Based on these findings, we offer the following recommendations for policy makers, development practitioners, and local stakeholders:

1. **Strengthen local institutions and governance capacity**

Capacity-building for POKDARWIS, women's cooperatives, and youth groups is essential for sustaining ecotourism initiatives. Training should include marketing, financial management, ecotourism certification, and digital skills.

## 2. **Promote inclusive participation**

Tourism planning must ensure that women, indigenous groups, youth, and marginalized actors are meaningfully involved in leadership and decision-making processes.

## 3. **Improve infrastructure and access to support services**

Address urgent infrastructure needs such as clean water, sanitation, transport, and waste management to enhance visitor experience and local well-being.

## 4. **Facilitate multi-stakeholder collaboration**

Encourage long-term partnerships between local communities, universities, NGOs, and government bodies to ensure sustainability, innovation, and shared responsibility.

## 5. **Integrate ecotourism into broader coastal resilience frameworks**

Community-based marine tourism should be embedded into regional development plans, disaster risk reduction strategies, and coastal management policies.

### *5.3 Implications for Future Research*

This study provides a conceptual and empirical foundation for understanding the social functions of ecotourism in coastal settings. Future research may:

1. Conduct **comparative studies** across different Indonesian coastal regions to explore variations in ecotourism impacts.
2. Use **longitudinal approaches** to assess the evolving nature of resilience over time.
3. Incorporate **mixed methods** for broader generalizability and to quantify socio-economic outcomes.
4. Explore the role of **digital transformation** in enhancing community-based tourism.
5. Investigate **youth migration patterns** and their implications for local human capital in ecotourism development.

In conclusion, marine ecotourism holds substantial promise for building community resilience—so long as it is participatory, inclusive, and embedded

in the lived realities of local people. Through a functionalist perspective, we see that its value lies not only in income generation, but also in the reproduction of social systems that ensure sustainable futures for Indonesia's coastal communities.

## Declarations

### Author Contribution Statement

All authors contributed equally to the conceptualization, fieldwork design, data collection, analysis, and interpretation of findings in the coastal community of Pangandaran, West Java. The manuscript was collaboratively written and critically revised by all authors. Each author approved the final version of the manuscript and agreed to be accountable for its contents.

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### Data Availability Statement

The qualitative data that support the findings of this study—such as interview transcripts, field notes, and anonymized FGD summaries—are available from the corresponding author upon reasonable request. Due to ethical and privacy considerations, raw data are not publicly available.

### Declaration of Interests Statement

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

### Additional Information

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## References

- Annas, F. B., Lubis, D. P., Hapsari, D. R., & Sumardjo, S. (2024). Convergence Communication In Community-Based Ecotourism Management. *Social Science and Humanities Journal*, 8(07), 4270–4283. <https://doi.org/10.18535/sshj.v8i07.1193>
- Apdillah, D., Wahyudin, Raza'i, T. S., Chalet, C., Suryanti, A., Zulkarnaen, Y., & Azizah, D. (2023). Carrying Capacity of Mangrove Environment for Development of River Cruise Ecotourism in Pengudang, Bintan Island, Indonesia. *Iop Conference Series Earth and Environmental Science*, 1148(1), 012018. <https://doi.org/10.1088/1755-1315/1148/1/012018>
- Ashokkumar, P., & Sangeetha, C. (2024). *Empowering Tea Tourism Through Community Participation: A Conceptual Study*. <https://doi.org/10.31235/osf.io/r3wmv>
- Astuti, W. K., Lestari, N. A. R., & Herlambang, S. (2021). Small Town Urbanization and Project Experimentation in Pangandaran Region, Indonesia. *Human Geographies – Journal of Studies and Research in Human Geography*, 15(2), 169–183. <https://doi.org/10.5719/hgeo.2021.152.3>
- Auliah, A., Prayitno, G., Ari, I. R. D., Adrianto, D. W., Subagiyo, A., Biloshkurska, N., & Ismaili, H. (2024). The Role of Community Social Capital and Collective Action in the Development of Sustainable Tourism. *International Social Science Journal*, 75(256), 311–325. <https://doi.org/10.1111/issj.12554>
- Ayun, N. Q., Dewi, L. S. K., Murwantoko, M., & Setyobudi, E. (2021). The Occurrence of Anisakis Larvae on Hairtail, *Trichiurus lepturus* Caught From the Pangandaran Waters, West Java, Indonesia. *Biodiversitas Journal of Biological Diversity*, 22(3). <https://doi.org/10.13057/biodiv/d220339>
- Bhatta, K. D. (2023). Community-Based Ecotourism and Perceived Economic Impacts: A Study of Rural Settlements Around Annapurna Conservation Area, Nepal. *Journal of Engineering Technology and Planning*, 4(1), 82–95. <https://doi.org/10.3126/joetp.v4i1.58444>

- Bing, W., Islam, K. M. S., & Hossen, Md. M. (2019). Economic Development Through the Implementation of Environment Policies. *International Journal of Research in Business and Social Science* (2147-4478), 8(6), 292–300. <https://doi.org/10.20525/ijrbs.v8i6.564>
- Burkhart, S., Hayman, A., Lam, F., Jones, B., Horsey, B., Craven, D., & Underhill, S. J. R. (2022). School Food Programmes in the Pacific Islands: Exploring Opportunities and Challenges for Creating Healthier School Food Environments. *Public Health Nutrition*, 26(2), 455–466. <https://doi.org/10.1017/s1368980022001951>
- Devlin, M., Breckels, M. N., Graves, C. A., Barry, J., Capuzzo, E., Huerta, F. P., Ajmi, F. A., Al-Hussain, M. M., LeQuesne, W. J. F., & Lyons, B. P. (2019). Seasonal and Temporal Drivers Influencing Phytoplankton Community in Kuwait Marine Waters: Documenting a Changing Landscape in the Gulf. *Frontiers in Marine Science*, 6. <https://doi.org/10.3389/fmars.2019.00141>
- Guo, Y., Zhang, J., Zhang, Y., & Zheng, C. (2018). Catalyst or Barrier? The Influence of Place Attachment on Perceived Community Resilience in Tourism Destinations. *Sustainability*, 10(7), 2347. <https://doi.org/10.3390/su10072347>
- Hadi, T. A., Hafizt, M., Hadiyanto, H., Budiyanto, A., & Siringoringo, R. M. (2018). Shallow Water Sponges Along the South Coast of Java, Indonesia. *Biodiversitas Journal of Biological Diversity*, 19(2), 485–493. <https://doi.org/10.13057/biodiv/d190223>
- Hampton, M. P., Bianchi, R., & Jeyacheya, J. (2023). Dynamics of Coastal Tourism: Drivers of Spatial Change in South-East Asia. *Singapore Journal of Tropical Geography*, 45(1), 54–69. <https://doi.org/10.1111/sjtg.12512>
- Hengky, S. H. (2019). Challenges Sustainable Coastal Tourism on Panjang Island. *Journal of Aquaculture & Marine Biology*, 8(5), 180–184. <https://doi.org/10.15406/jamb.2019.08.00259>
- Hermawan, H., Nugroho, D. S., Afif, F., Wijayanti, A., Ahmad, A., & Valeri, M. (2024). Leadership Rooted in Community-Based Local Wisdom Values. *Media Wisata*, 22(2), 237–258. <https://doi.org/10.36276/mws.v22i2.762>
- Hewitt, J. E., Ellis, J. I., & Thrush, S. F. (2016). Multiple Stressors, Nonlinear Effects and the Implications of Climate Change Impacts on Marine

- Coastal Ecosystems. *Global Change Biology*, 22(8), 2665–2675. <https://doi.org/10.1111/gcb.13176>
- Hidayah, R. T., Iskamto, D., & Utami, E. M. (2023). Behavioral Intention Analysis on Aspiring Geopark Tourists: A Case Study in Pangandaran. *International Journal of Entrepreneurship and Business Management*, 2(1), 72–82. <https://doi.org/10.54099/ijebm.v2i1.585>
- Hsiao, C. Y., Kuo, C. M., & Tuan, C. L. (2021). Island Ecological Tourism: Constructing Indicators of the Tourist Service System in the Penghu National Scenic Area. *Frontiers in Ecology and Evolution*, 9. <https://doi.org/10.3389/fevo.2021.708344>
- Irpan, A. M., Kurniasih, S., Sutjihati, S., Lathifah, S. S., Anugrah, R., Aqila, S., & Alfieansyah, M. (2024). Analysis of Macroalgae Diversity in the West Coastal of Pananjung Beach, Pangandaran. *Kne Life Sciences*. <https://doi.org/10.18502/kls.v8i1.15502>
- Kassa, G., Teferi, B., & Delelegn, N. (2018). The Poverty—Environment Nexus in Developing Countries: Evidence From Ethiopia: A Systematic Review. *Asian Journal of Agricultural Extension Economics & Sociology*, 24(3), 1–13. <https://doi.org/10.9734/ajaees/2018/39310>
- Khalid, S., Ahmad, M. S., Ramayah, T., Hwang, J., & Kim, I. (2019). Community Empowerment and Sustainable Tourism Development: The Mediating Role of Community Support for Tourism. *Sustainability*, 11(22), 6248. <https://doi.org/10.3390/su11226248>
- Kumar, S., Hasija, N., Kumar, V., & Sageena, G. (2023). Ecotourism: A Holistic Assessment of Environmental and Socioeconomic Effects Towards Sustainable Development. *Current World Environment*, 18(2), 589–607. <https://doi.org/10.12944/cwe.18.2.14>
- Lee, J., Kim, S., & Kwon, H. (2017). Mapping Interests by Stakeholders' Subjectivities Toward Ecotourism Resources: The Case of Seocheon-Gun, Korea. *Sustainability*, 9(1), 93. <https://doi.org/10.3390/su9010093>
- Lee, T. H., & Jan, F. (2017). Ecotourism Behavior of Nature-Based Tourists: An Integrative Framework. *Journal of Travel Research*, 57(6), 792–810. <https://doi.org/10.1177/0047287517717350>
- Louisor, J., Brivois, O., Mouillon, P., Maspataud, A., Belz, P., & Laloue, J.-M. (2022). Coastal Flood Modeling to Explore Adaptive Coastal Management Scenarios and Land-Use Changes Under Sea Level Rise.

doi: <https://doi.org/xxx.xxx>

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- Frontiers in Marine Science*, 9.  
<https://doi.org/10.3389/fmars.2022.710086>
- Manner-Baldeon, F., Carvache-Franco, M., & Carvache-Franco, W. (2024). *Tourism and Hospitality Management*, 30(1).  
<https://doi.org/10.20867/thm.30.1>
- Maudiarti, S., & Adriani, H. (2021). Investigating the History of East Sakerta Village as a Popular Tourist Destination in West Java. *Akademika*, 10(02), 405–416. <https://doi.org/10.34005/akademika.v10i02.1115>
- Mistriani, N., Ihalauw, J. J., & Priyanto, S. H. (2024). Three Main Pillars of Agrotourism Success in Lerep Tourism Village: Farmer Groups, Pokdarwis, and BUMDes. *Icgtsave*, 1(2), 99–112.  
<https://doi.org/10.62951/icgtsave.v1i2.31>
- Musleh, M., Subianto, A., & Prasita, V. D. (2023). Stakeholder Interaction in the Development of Oxygen Ecotourism on Gili Iyang Island, Indonesia. *Journal of Government and Civil Society*, 7(2), 297.  
<https://doi.org/10.31000/jgcs.v7i2.8251>
- Muslim, M. (2021). Communication Strategy for the Development of Almous Ecotourism in the Island of the Kelapa Island. *JHSS (Journal of Humanities and Social Studies)*, 5(2), 218–225. <https://doi.org/10.33751/jhss.v5i2.5422>
- Nazirullah, Som, A. P. M., Shariffuddin, N. S. M., Wan Mohd Adzim Wan Mohd Zain, & Qassem, A. A. (2023). The Influence of Socio-Cultural and Economic Impact on Tourism Support: A Mediating Role of Community Value. *Planning Malaysia*, 21. <https://doi.org/10.21837/pm.v21i25.1230>
- Nijman, V. (2021). Tourism Developments Increase Tsunami Disaster Risk in Pangandaran, West Java, Indonesia. *International Journal of Disaster Risk Science*, 12(5), 764–769. <https://doi.org/10.1007/s13753-021-00365-3>
- Nofrion, N., Purwanto, S., Utomo, E. P., & Aziz, S. A. (2023). The Development Model of Community-Based Tourism in Nagari Koto Sani, Solok Regency, West Sumatra. *Geoeco*, 9(2), 160.  
<https://doi.org/10.20961/ge.v9i2.71735>
- Noor, F., Alamgir, A., Khan, M. A., & Owais, M. (2022). Climate Vulnerability Index of the Coastal Subdistricts of Badin, Sindh, Pakistan. *Kuwait Journal of Science*. <https://doi.org/10.48129/kjs.17873>

- Nurhayati, A., Aisah, I., & Supriatna, A. K. (2018). *Development Model Of Synergistic Sustainable Marine Ecotourism (Case Study in Pangandaran Region, West Java Province, Indonesia)*. <https://doi.org/10.20944/preprints201811.0346.v1>
- Nurhayati, A., Aisah, I., & Supriatna, A. K. (2019). Model Development of a Synergistic Sustainable Marine Ecotourism—A Case Study in Pangandaran Region, West Java Province, Indonesia. *Sustainability*, 11(12), 3418. <https://doi.org/10.3390/su11123418>
- Olán-González, M., Reyes-Bonilla, H., Arreola-Alarcon, I. M., Uribe, R. V., & Olivier, D. (2023). Ecotourism Impacts on Reef Fishes in a Marine Reserve During the COVID-19 Era. *Frontiers in Ecology and the Environment*, 21(7), 317–323. <https://doi.org/10.1002/fee.2657>
- Palupi, M., Fitriadi, R., Wijaya, R., RAHARJO, P., & Nurwahyuni, R. N. R. (2021). Diversity of Phytoplankton in the Whiteleg (*Litopenaeus Vannamei*) Shrimp Ponds in the South Coastal Area of Pangandaran, Indonesia. *Biodiversitas Journal of Biological Diversity*, 23(1). <https://doi.org/10.13057/biodiv/d230115>
- Porter, B. A., Orams, M. B., & Lück, M. (2015). Surf-Riding Tourism in Coastal Fishing Communities: A Comparative Case Study of Two Projects From the Philippines. *Ocean & Coastal Management*, 116, 169–176. <https://doi.org/10.1016/j.ocecoaman.2015.07.015>
- Riniwati, H., Harahab, N., & Abidin, Z. (2019). A Vulnerability Analysis of Coral Reefs in Coastal Ecotourism Areas for Conservation Management. *Diversity*, 11(7), 107. <https://doi.org/10.3390/d11070107>
- Roscher, M., Eriksson, H., Harohau, D., Mauli, S., Kaltavara, J., Boonstra, W. J., & Ploeg, J. v. d. (2022). Unpacking Pathways to Diversified Livelihoods From Projects in Pacific Island Coastal Fisheries. *Ambio*, 51(10), 2107–2117. <https://doi.org/10.1007/s13280-022-01727-x>
- Rumanti, A. A., Amelia, M., Rizaldi, A. S., & Supratman, N. A. (2024). Edu-Tourism Through Digital Literacy Based on Science and Technology in Community Empowerment Efforts to Improve the Economy in Banyuwangi Regency. *Metris Jurnal Sains Dan Teknologi*, 25(02), 67–74. <https://doi.org/10.25170/metris.v25i02.5423>
- Sitorus, N. B., Liyushiana, L., & Sinaga, D. C. (2023). The Potential of Sustainable Livelihood-Based Tourism in Kuta Jungak Tourism Village, Pakpak

doi: <https://doi.org/xxx.xxx>

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- Bharat District. *Jurnal Ilmiah Global Education*, 4(2), 631–639.  
<https://doi.org/10.55681/jige.v4i2.782>
- Su-lan, C., Bruyne, C. D., & Bollempalli, M. (2020). Blue Economy: Community Case Studies Addressing the Poverty–Environment Nexus in Ocean and Coastal Management. *Sustainability*, 12(11), 4654.  
<https://doi.org/10.3390/su12114654>
- The Role of Ecotourism in the Social and Economic Field*. (2022).  
<https://doi.org/10.11594/nstp.2022.2510>
- Tjong, G. P., Supriatna, J., Takarina, N. D., & Tambunan, R. P. (2021). Mangrove Diversity and Suitability Assessments for Ecotourism in Cimalaya Wetan Coast, Karawang District, Indonesia. *Biodiversitas Journal of Biological Diversity*, 22(2). <https://doi.org/10.13057/biodiv/d220234>
- Ulfa, M., & Harahap, M. M. (2022). The Development Potential Level of Bagan Serdang Mangrove Ecotourism, Pantai Labu Subdistrict. *Iop Conference Series Earth and Environmental Science*, 977(1), 012094.  
<https://doi.org/10.1088/1755-1315/977/1/012094>
- UMAM, K., Kurniawati, E., & Widiyanto, A. A. (2022). The Dynamics of “Pokdarwis Capung Alas” in the Development of Community—Based Tourism in Pujon Kidul Village During the Covid-19 Pandemic. *Geojournal of Tourism and Geosites*, 43(3), 850–857.  
<https://doi.org/10.30892/gtg.43302-896>
- Waridin, W., Dzulkhijiana, A., & Mafruhah, I. (2018). Community Empowerment in Rural Infrastructure Development Program. *Economic Journal of Emerging Markets*, 10(1), 8–14.  
<https://doi.org/10.20885/ejem.vol10.iss1.art2>
- Wibisono, H. K., Prastyawan, A., Noviyanti, W. R., Badi’ah, A., & Klemens, K. (2024). A Canvas Model for Planning and Development Strategy of Rural Sustainable Tourism. *E3s Web of Conferences*, 513, 01007.  
<https://doi.org/10.1051/e3sconf/202451301007>
- Wishitemi, B., Momanyi, S., Ombati, B. G., & Okello, M. M. (2015). The Link Between Poverty, Environment and Ecotourism Development in Areas Adjacent to Maasai Mara and Amboseli Protected Areas, Kenya. *Tourism Management Perspectives*, 16, 306–317.  
<https://doi.org/10.1016/j.tmp.2015.07.003>

- Woo, E., Kim, H., & Uysal, M. (2015). Life Satisfaction and Support for Tourism Development. *Annals of Tourism Research*, 50, 84–97. <https://doi.org/10.1016/j.annals.2014.11.001>
- Yang, E., & Kim, J. (2023). Sustainable Tourism Development in a Host Community: The Mediating Role of Community Resilience in Response to Disasters and Crises. *International Journal of Tourism Research*, 25(5), 527–541. <https://doi.org/10.1002/jtr.2592>
- Yasir, Y. (2019). *Environmental Communication Planning in the Development of Mangrove Ecotourism in Bengkalis Indonesia*. <https://doi.org/10.2991/iccelst-ss-19.2019.3>
- Zamzami, L., Aliman, M., & AZWAR, A. (2021). The Effect of Ecotourism Development on Marine Conservation Area in West Sumatera, Indonesia. *Geojournal of Tourism and Geosites*, 38(4), 1166–1174. <https://doi.org/10.30892/gtg.38423-757>
- Zukhri, N., & Rosalina, E. (2024). Ecotourism for Sustainability: An in-Depth Perception and Evaluation Analysis of Community-Based “Belitong Geopark” in Belitung Island. *Iop Conference Series Earth and Environmental Science*, 1419(1), 012068. <https://doi.org/10.1088/1755-1315/1419/1/012068>