

(Research/ Review) Article

Sustainable Coastal Tourism Planning in Mursala Island, Central Tapanuli Regency

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Abstract: Mursala Island is one of the potential coastal tourism areas in Central Tapanuli Regency, known for its natural uniqueness and rich local culture. However, tourism development in this area remains unstructured and unsustainable. This study aims to analyze the current conditions, infrastructure readiness, accessibility, community participation, and the level of local socio-cultural resilience toward tourism in order to formulate strategies for sustainable coastal tourism development. A mixed-methods approach was employed, with primary data collected through observation, in-depth interviews, and a questionnaire distributed to 100 respondents. The results show that local socio-cultural resilience is the most strategic variable in supporting tourism interest (mean = 4.06), followed by community participation (3.82), infrastructure readiness (3.61), and accessibility (3.26). Qualitative findings reinforce these results, revealing that while the community actively maintains cultural traditions, they face access barriers and lack participatory institutions. A SWOT analysis led to realistic strategies such as establishing a Local Customary Tourism Unit, developing permanent piers and sea transportation, and drafting a village regulation (Perdes) on culture-based tourism. This study concludes that sustainable coastal tourism development in Mursala Island must be grounded in the strength of local social capital, cultural preservation, and improvements in accessibility and infrastructure. The findings contribute theoretically to strengthening the concept of Community-Based Tourism (CBT) and practically to informing policy direction for locally-based coastal tourism area development.

Keywords: Coastal Tourism; Community Participation; Mursala Island; Socio-Cultural Resilience.

Received: May 30, 2025;

Revised: June 30, 2025;

Accepted: July 12, 2025;

Published : July 30, 2025

Curr. Ver.: July 30, 2025



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1. Introduction

Coastal tourism is one of the leading sub-sectors with great potential to drive regional economic growth, strengthen local identity, and preserve coastal environments. In Indonesia, coastal tourism destinations have developed rapidly over the past few decades, in line with the growing awareness of the importance of sustainable development and coastal area conservation (Gunn & Var, 2021). However, coastal tourism development that is carried out without a knowledge-based planning approach may exert pressure on local values, ecosystem capacity, and social equilibrium.

One area of focus in this context is Mursala Island, a tropical island located in Central Tapanuli Regency, North Sumatra. The island features natural uniqueness such as a waterfall that flows directly into the sea, tropical rainforests, and beaches with high ecotourism quality. These potentials make Mursala Island a valuable marine tourism asset. However, its development has so far been sporadic and lacks a long-term plan that integrates social, cultural, and ecological principles.

One particularly concerning phenomenon is the pressure on social structures and local cultural values due to tourism development interventions that disregard local wisdom (Akbar et al., 2025; Nuraini & Sugiarto, 2025; Suprianto et al., 2025). Communities in coastal areas are often not given space to preserve their identity, whether in the form of customary traditions, spiritual practices, or social norms that define their community. A study by Nuraini et

al. (2023) revealed that land-use changes and the erosion of cultural values are often inevitable consequences of tourism destination development that is insensitive to local contexts.

Moreover, the success of coastal tourism development does not solely depend on the presence of natural attractions, but is also significantly influenced by non-physical factors such as infrastructure readiness, community engagement, regional accessibility, and local socio-cultural resilience to change. However, the aspect of socio-cultural resilience as a form of social protection of cultural values and community practices has received little attention in tourism planning studies.

The concept of socio-cultural resilience reflects a community's capacity to adapt, endure, and preserve its cultural identity amidst globalization and the influx of tourists. Research by Haloho & Sugiarto (2024) emphasized that tourism destinations that maintain their socio-cultural authenticity tend to have higher market value and long-term viability. Therefore, it is essential to explicitly integrate socio-cultural dimensions into coastal tourism planning, particularly in areas like Mursala Island that strongly retain their local character.

In the case of Mursala Island, there has been little research that comprehensively examines the interconnection between infrastructure, accessibility, community participation, and socio-cultural resilience in the context of sustainable coastal tourism development. This research is thus essential as it opens the way for designing tourism development strategies based on local character, rather than purely on physical development.

Accordingly, this study is expected to contribute scientifically to regional and urban planning, particularly in approaches to sustainable coastal tourism development that consider socio-cultural factors—an area often overlooked in previous research. In addition, the study aims to provide strategic insights for local governments and tourism stakeholders in formulating inclusive development policies that are grounded in local values and resilient to external pressures.

Based on the background, the research questions are as follows: 1) What is the current condition of infrastructure readiness, accessibility, and community participation in supporting coastal tourism development in Mursala Island?; 2) What is the level of local socio-cultural resilience to tourism activities in Mursala Island?; 3) What are the appropriate strategies for planning sustainable coastal tourism development in Mursala Island based on those conditions?

This research aims to: 1) Analyze the conditions of infrastructure readiness, accessibility, and community participation in supporting coastal tourism in Mursala Island, 2) Identify and measure local socio-cultural resilience in facing the dynamics of tourism activities, 3) Formulate sustainable coastal tourism development strategies based on the potential and strengths of the local community in Mursala Island.

Research benefits; Academically, this study contributes to the development of theories in coastal tourism planning with a socio-cultural approach and introduces a new variable—local socio-cultural resilience—as a strategic element in tourism. Practically, this research serves as a reference for local governments in formulating community-based tourism development strategies and provides concrete recommendations for strengthening the social and cultural fabric in the face of tourism-driven transformations.

Review of Previous Studies; Research by Nuraini et al. (2023) emphasized that the lack of community involvement in tourism development often leads to social conflict and unequal access to economic benefits. Cut Nuraini et al. (2022) found that the social characteristics of coastal communities must be considered in destination development policies. A study by Cheng et al. (2021) in the *Journal of Sustainable Tourism* also highlighted that preserved local culture is a key factor for long-term tourism success. Meanwhile, research by Aini, Azizah, & Muharrani (2023) in North Sumatra showed that communities with strong value systems are more capable of adapting to tourism development without losing their identity.

However, to date, there has been no research that explicitly places local socio-cultural resilience as a primary variable in coastal tourism planning models. This makes the present study not only contextually relevant but also of significant scientific novelty.

2. Preliminaries or Related Work or Literature Review

Sustainable Development Theory

Sustainable development theory serves as a fundamental framework for designing tourism area development that balances economic needs, environmental preservation, and social aspirations. According to the World Commission on Environment and Development (WCED, 1987) in the *Our Common Future* report, sustainable development is defined as

“development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

In the context of tourism, sustainable development encompasses not only environmental conservation but also community involvement and the preservation of local culture as part of the social sustainability pillar (Gunn & Var, 2021). This approach is particularly relevant to coastal areas like Mursala Island, which are vulnerable to ecological and social pressures resulting from poorly planned tourism activities. This theory is reinforced by Nuraini (2022), who argues that tourism objectives will only be achieved if planning approaches thoroughly address social and cultural dimensions—not merely physical or economic factors.

Community-Based Tourism (CBT) Theory

The Community-Based Tourism (CBT) theory emphasizes the active role of local communities in the planning, management, and supervision of tourism activities. The core principle of CBT is that local people are not merely objects of tourism but empowered subjects who have ownership of the process and the benefits derived from tourism development (Sugiarto & Ramadania, 2024).

CBT allows communities to maintain local identity, build self-capacity, and improve well-being through direct participation. This model aligns with the conditions on Mursala Island, where local wisdom remains strong, and the community has the potential to manage tourism independently if given proper support. Effendi & Rambe (2023) state that the CBT approach is effective in natural tourism areas that are still pristine and underexploited. Through this approach, community participation and socio-cultural resilience—two variables in this research—can be understood as integral parts of the local strength in facing the dynamics of tourism development.

Integrated Tourism Planning Theory

The theory of integrated tourism planning refers to systematic efforts to develop tourism areas by incorporating spatial, social, economic, and cultural aspects into a unified planning framework (Inskeep, 2021). Although the spatial aspect is not the main technical focus in this study, the integrative principle serves as the foundation for formulating coastal community tourism development strategies that consider the area's carrying capacity and social capabilities.

Integrated planning emphasizes the importance of analyzing existing conditions, cross-sectoral integration (transportation, infrastructure, institutions), and the formulation of strategies based on local characteristics. This view is supported by Milanie (2024), who emphasizes that the success of tourism planning in coastal regions heavily depends on how well local socio-cultural values are used as the foundation for development strategies.

Conceptual Review and Variable Definitions

Local Socio-Cultural Resilience to Tourism (X1)

Socio-cultural resilience refers to the community's ability to preserve values, norms, and social-cultural practices amidst changes brought about by tourism. This variable includes dimensions such as identity preservation, adaptation to tourists, and community capacity to maintain social integrity (Cheng et al., 2021).

Tourism Infrastructure Readiness (X2)

This refers to the completeness of physical facilities that support tourism activities, including accommodations, local transportation, communication access, and basic utilities (UNWTO, 2022).

Community Participation (X3)

Measured by the extent of community involvement in decision-making, planning, and tourism management, as well as their ability to derive both economic and social benefits from tourism (Abdiyanto, 2023).

Physical Accessibility and Transportation (X4)

Describes the ease and affordability for tourists to access Mursala Island, including the availability of transportation, travel distances, and the condition of roads and port infrastructure.

Potential for Sustainable Coastal Tourism Development (Y)

Measured by the perceptions of local communities and stakeholders regarding the prospects for environmentally friendly, locality-based tourism development that offers long-term benefits (Linda et al., 2024).

Conceptual Framework of the Study

Based on the aforementioned theoretical foundation, the relationships between variables can be illustrated in the following conceptual framework:

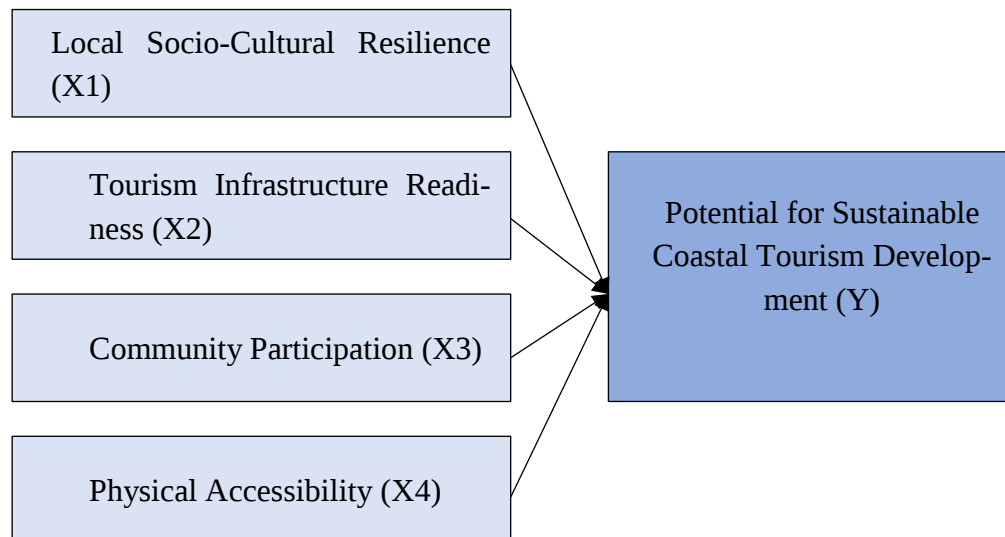


Figure 1. Conceptual Framework of the Study

Source: Designed by the Author

Research Hypotheses (if quantitative analysis is included)

- **H₁:** There is a positive influence of Local Socio-Cultural Resilience on the Potential for Sustainable Coastal Tourism Development.
- **H₂:** Tourism Infrastructure Readiness influences the Potential for Tourism Development.
- **H₃:** Community Participation has a significant influence on the Potential for Tourism Development.
- **H₄:** Physical Accessibility influences the Potential for Sustainable Coastal Tourism Development.

3. Proposed Method

Research Approach

This study employs a Mixed Methods approach, which combines both qualitative and quantitative methods to obtain a comprehensive overview of the social, cultural, and infrastructure conditions related to the development of sustainable coastal tourism. This approach is chosen because it captures the depth of meaning from the perspective of local communities (qualitative), while also allowing for structured measurement of perceptions through surveys (quantitative). According to Creswell (2020), Mixed Methods is an effective strategy for integrating the strengths of both narrative and numerical data in order to develop more accurate and applicable planning recommendations.

In this research, the qualitative approach is used to understand the socio-cultural phenomena of the Mursala Island community through interviews and observation, while the quantitative approach is used to measure community perceptions using a Likert-scale questionnaire.

Research Location and Period

The research was conducted on Mursala Island, located in Tapian Nauli District, Central Tapanuli Regency, North Sumatra Province. This location was selected due to its distinctive geographical and social characteristics and its strategic potential for marine tourism development. The study was conducted from November 2024 to February 2025, covering the phases of preparation, data collection, analysis, and final report writing.

Population and Sample

The population of this study includes all local residents of Mursala Island who are directly or indirectly involved in tourism activities, including tourism entrepreneurs, village youth, and traditional leaders. The sample was selected purposively to ensure representation across different groups (traditional leaders, fishermen, tourism actors, general residents). For the quantitative component, a total of 100 respondents were selected, adjusted based on the area coverage and descriptive analysis requirements. For the qualitative component, in-depth interviews were conducted with 10–15 key informants until data saturation was reached.

Research Variables

Tabel 1. Research Variables

Kode	Variabel	Jenis
X1	Local Socio-Cultural Resilience toward Tourism	Independent
X2	Tourism Infrastructure Readiness	Independent
X3	Community Participation	Independent
X4	Physical Accessibility and Transportation	Independent
Y	Potential for Sustainable Coastal Tourism Development	Dependent

Source: Designed by the author

Types and Sources of Data

This research utilizes primary data, collected through the following methods:

- Direct observation of physical conditions and community activities.
- Semi-structured interviews with key informants.
- Closed-ended questionnaires using a Likert scale (1–5) distributed to local community respondents.

Data Collection Techniques

- Participatory Observation: Conducted by recording social phenomena, tourism activities, existing infrastructure, and community interactions with tourists.
- In-depth Interviews: Conducted with traditional leaders, tourism managers, and community representatives to explore perspectives on socio-cultural dynamics and community preparedness for tourism development.
- Questionnaire Instrument: Designed based on indicators of each variable and distributed directly to respondents using a Likert scale.

Data Analysis Techniques

Qualitative Analysis

Qualitative data were analyzed using a thematic analysis approach, which involves identifying patterns of meaning from interview and observation results. The analysis process includes: (1) transcribing interview data, (2) coding and categorizing themes, and (3) interpreting the social and cultural meanings.

Analisis Kuantitatif

Quantitative data were analyzed using descriptive statistical techniques, which include: (1) frequency distribution, (2) calculating the mean and percentages, and (3) cross-tabulation between variables.

Analisis SWOT

The results of both qualitative and quantitative analyses were integrated into a SWOT matrix to develop: (1) internal strengths and weaknesses (infrastructure, participation, culture), (2) external opportunities and threats (accessibility, tourism pressure), and (3) strategies for sustainable coastal tourism development based on local potential.

4. Results and Discussion

Mursala Island is one of the outermost islands in the western region of North Sumatra Province and is administratively located in Tapan Nauli District, Central Tapanuli Regency. Geographically, the island lies on the western coast of the Indian Ocean and is accessible only by sea transportation from Pandan or Sibolga Port, with a travel time of approximately 1 to

1.5 hours depending on weather conditions. The island is surrounded by dense tropical forests, rocky beaches, and clear waters rich in coral reefs, making it a high-potential area for nature-based marine tourism development.

Socially and demographically, Mursala Island is inhabited by a small community of fishermen and coconut farmers who live in a communal social structure governed by traditional family systems. The local people uphold traditional values and solidarity, especially in religious activities and communal work. The daily languages spoken are Batak and Indonesian, with some residents able to communicate in basic terms with tourists. Access to essential services such as education and healthcare is still limited and highly dependent on mainland facilities. Economically, the main livelihoods include fishing, coconut cultivation, and small-scale enterprises such as handicrafts and seafood sales. Although the presence of tourists in recent years has not significantly impacted the local economy, it indicates potential additional income for the community. The tourism sector offers great opportunities as a means of local economic diversification, particularly if implemented sustainably.

Culturally, the people of Mursala Island still preserve traditional customs such as sea rituals (mangupa), mutual assistance values, and local wisdom-based resource management. These cultural elements have strong potential to be developed as part of a cultural tourism experience, which has not yet been professionally explored. Mursala Island also holds a unique natural attraction, particularly a rare waterfall that flows directly into the sea — one of the few such phenomena in the world. Moreover, the waters surrounding the island are ideal for snorkeling and diving, while its coastline offers visually appealing landscapes for photography and adventure tourism.

Nevertheless, infrastructure limitations, lack of promotion, and the absence of an integrated development plan have resulted in the area not being optimally developed as a leading tourism destination. Overall, observations show that Mursala Island possesses strong natural and socio-cultural resources to be developed into a sustainable coastal tourism area. However, such development requires a structured, community-based approach that considers ecological carrying capacity and the cultural resilience of the local community to avoid social pressure and environmental degradation.

Respondent Characteristics

The characteristics of respondents in this study include age, gender, education level, and type of employment. This data was collected from 100 respondents residing on Mursala Island, selected based on their direct or indirect involvement in tourism activities.

Respondent Age Distribution

Table 2. Age of Respondents

Age	Total
<25	15
25-34	30
35-44	25
45-54	20
≥55	10

Source: Author

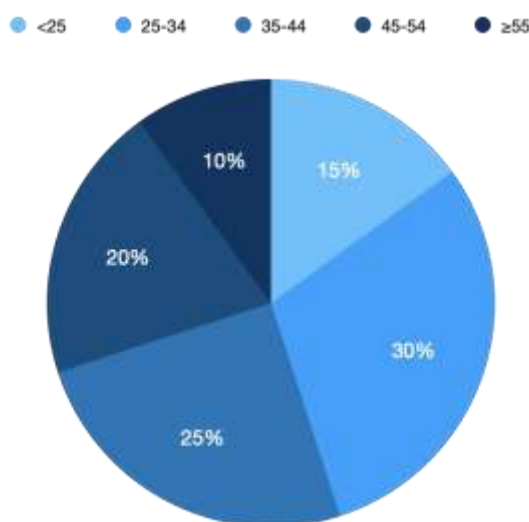


Figure 2. Age of Respondents

Source: Designed by the author

Based on Table 2 and Figure 2, most respondents fall within the productive age group. The largest age group is 25–34 years, comprising 30% of the sample, followed by 35–44 years at 25%, 45–54 years at 20%, and those under 25 at 15%. Meanwhile, only 10% of respondents are aged 55 and above.

These findings indicate that the majority of respondents are in the active working age group, making them potentially valuable for direct or indirect involvement in tourism development. The availability of young labor also represents a social asset that can support the growth of community-based tourism.

Distribution of Respondents by Gender

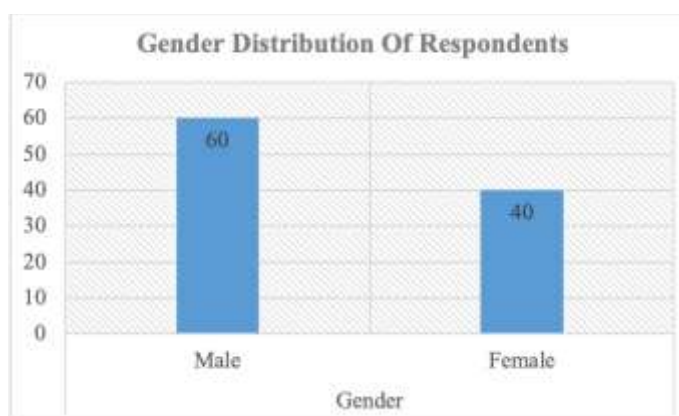


Figure 3. Gender of Respondents

Source: Designed by the author

The survey results show that male respondents dominate with 60%, while female respondents account for 40%. As illustrated in Figure 4.2, the dominance of male respondents reflects the nature of occupations that tend to be male-dominated, such as fishing, physical labor, and field-based tourism activities.

However, women also play an important role, particularly in household economic activities, handicraft production, and local culinary businesses, which can form part of the tourism value chain. Therefore, future tourism development strategies need to consider gender dimensions in a balanced and inclusive manner.

Respondents' Education Level

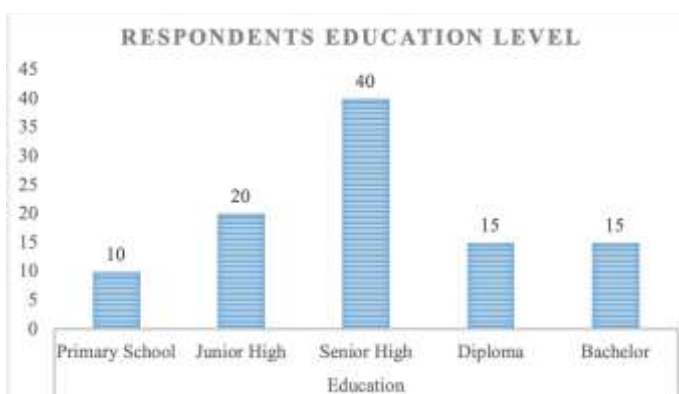


Figure 4. Respondents' Education Level

Source: Designed by the author

Most respondents have a secondary education level. Figure 4.3 shows that high school graduates dominate at 40%, followed by junior high school graduates (20%), bachelor's degree holders (15%), diploma holders (15%), and only 10% are elementary school graduates.

This education level is reasonably supportive for practical and applicable tourism management training. However, the low proportion of higher education indicates the need for capacity building through technical assistance and enhanced tourism literacy.

Respondents' Occupation Types

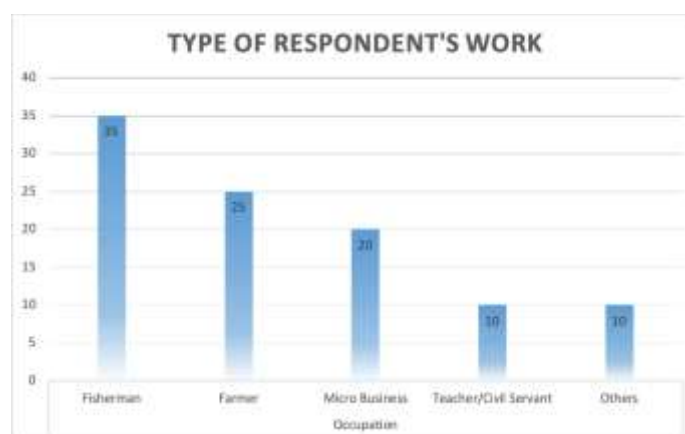


Figure 5. Respondents' Occupation Types

Source: Designed by the author

Figure 4.4 indicates that the majority of respondents work as fishermen (35%) and coconut farmers (25%). Respondents engaged in micro-businesses related to tourism (such as culinary services, transportation, or boat rentals) make up 20%. Meanwhile, civil servants/teachers account for only 10%, with the remaining 10% working in other sectors.

The predominance of respondents in the primary sector reflects that the local economy in Mursala Island is still based on natural resources. However, the presence of micro-business actors indicates the early emergence of tourism-related activities that could be further developed. Therefore, local economic empowerment strategies through tourism should aim to synergize the primary sector with tourism services.

Quantitative Research Results (Descriptive Statistics)

Descriptive statistical analysis was conducted on five main variables in this study: X1 (Local Socio-Cultural Resilience toward Tourism), X2 (Readiness of Tourism Infrastructure), X3 (Community Participation), X4 (Accessibility), and Y (Potential for Sustainable Coastal Tourism Development). Each variable was measured using a 5-point Likert scale and analyzed using the mean, mode, and range values. The following table presents the results of the descriptive statistics test:

Table 3. Quantitative Research (Descriptive Statistics)

Variable	Mean	Mode	Value Range (Min–Max)
X1_ Socio-Cultural Resilience	4.06	4	3.1 – 4.8
X2_ Infrastructure Readiness	3.61	4	2.6 – 5.0
X3_ Community Participation	3.82	4	2.3 – 5.0
X4_ Accessibility	3.26	3	1.9 – 4.5
Y_ Sustainable Tourism Potential	3.98	4	3.1 – 5.0

Source: Compiled by the author

Based on Table 3, it is evident that the average score for Local Socio-Cultural Resilience toward Tourism (X1) is 4.06, with a mode of 4, and a range between 3.1 and 4.8. These results indicate that most respondents have a positive perception of the community's ability to preserve cultural values amidst growing tourism activity. This reflects that Mursala Island has a strong social foundation to undergo transformation into a tourism destination, consistent with the findings of Haloho & Sugiarto (2024).

The variable of Tourism Infrastructure Readiness (X2) has an average of 3.61, a mode of 4, and a range from 2.6 to 5.0. This suggests that infrastructure readiness is moderate to

high. Respondents assessed that basic facilities such as transportation, rest areas, and toilets are fairly adequate but unevenly distributed. This indicates that although some supporting infrastructure exists, further planning is needed to meet tourist comfort standards.

The average score for Community Participation (X3) is 3.82, with a mode of 4 and a range from 2.3 to 5.0. This value reflects a good level of community involvement in tourism management. Most respondents felt involved in deliberation activities and the management of small tourism businesses. This supports the relevance of implementing a Community-Based Tourism (CBT) approach, as proposed by Sugiarto & Ramadania (2024).

The mean score for Physical Accessibility and Transportation (X4) is 3.26, with a mode of 3 and a range from 1.9 to 4.5. These results indicate that community perceptions of accessibility are still at a moderate level. Some respondents reported challenges such as limited marine transportation, infrequent departure schedules, and high dependence on weather conditions. These factors pose specific challenges in developing Mursala Island as a leading tourist destination.

The dependent variable, Potential for Sustainable Coastal Tourism Development (Y), has an average of 3.98, a mode of 4, and a range from 3.1 to 5.0. This suggests that most of the community is optimistic about the opportunities for developing sustainable coastal tourism on Mursala Island. This is reinforced by a combination of natural potential, local culture, and community openness to positive changes.

Qualitative Research Results (Interviews & Observations)

The qualitative research aimed to explore the perspectives and experiences of the local community in facing the dynamics of coastal tourism development on Mursala Island. Data collection techniques included in-depth interviews and participatory observation, with key informants consisting of traditional leaders, tourism business actors, and community representatives. Thematic analysis of the interview narratives revealed three main themes that reflect the socio-cultural conditions and development challenges of tourism in the area.

Theme 1: Cultural Preservation Remains Active

Most informants indicated that the people of Mursala Island continue to practice traditional customs and rituals regularly. This suggests that local values remain preserved despite increasing contact with outside tourists.

"We still perform mangupa when guests come from outside—it's part of our tradition to welcome people... even now with tourism, we haven't changed our ways."
(Interview with Traditional Leader, July 12, 2024)

"The youth here are being encouraged again to learn our traditional language and prayers, so they don't disappear because of tourism."
(Interview with Housewife, July 15, 2024)

Observations also noted that places of worship and cultural sites are well maintained and even included as points of interest in several informal tourism packages. This represents a local strength in supporting a culture-based tourism approach.

Theme 2: Lack of Participatory Forums

Although the community shows enthusiasm for tourism development, many feel they are not sufficiently given space to voice their ideas or be involved in planning and decision-making processes.

"We often hear about tourism meetings at the subdistrict office, but people here are rarely invited—even though we are the ones who live on this island and own the land."
(Interview with Fisherman, July 18, 2024)

"If the government wants to build tourist facilities, it would be better to hold a collective discussion first... so we can be informed and help out."
(Interview with Local Youth, July 20, 2024)

The absence of formal forums or local institutions to accommodate community aspirations presents a challenge for implementing Community-Based Tourism (CBT), which emphasizes inclusive participation from the outset.

Theme 3: Accessibility Disparities

Accessibility to Mursala Island remains a key issue, particularly in terms of available transportation modes, schedules, and unpredictable costs. Residents noted that these challenges are experienced not only by tourists but also by themselves in commuting to the mainland.

“When the waves are high, the boat from Pandan might be canceled. Sometimes we can’t leave the island for up to two days.”

(Interview with Guesthouse Owner, July 23, 2024)

“Tourists often complain about how hard it is to find a boat here—especially those who need to return urgently due to illness.”

(Interview with Tourism Operator, July 25, 2024)

Observations revealed that there is still no regular transport system from the mainland to the island. Most access relies on privately owned or rented boats, which hampers the smooth flow of visitors and logistics.

SWOT Analysis

A SWOT analysis was conducted to identify the strengths, weaknesses, opportunities, and threats influencing the development of sustainable coastal tourism on Mursala Island. The information was gathered from questionnaires, interviews, and field observations, then synthesized to formulate practical and realistic strategies to be proposed to stakeholders.

Table 4. SWOT Matrix of Mursala Island Tourism Development

Strengths (S)	Weaknesses (W)
S1: Strong preservation of local cultural values (X1)	W1: Low physical accessibility, weather-dependent (X4)
S2: High community participation (X3)	W2: Inadequate and uneven tourism infrastructure (X2)
S3: Community openness toward tourists (X1)	W3: Lack of official participatory forums or institutions (X3)
Opportunities (O)	Threats (T)
O1: Regional government support for the tourism sector	T1: Potential for cultural exploitation without proper oversight
O2: Increasing interest in remote natural destinations	T2: Environmental degradation due to uncontrolled tourism
O3: Potential collaboration with small to medium tourism investors	T3: Economic inequality if local communities are excluded

Source: Compiled by the author

Development Strategies Based on the SWOT Matrix

SO Strategy (Strength–Opportunity): Leverage strengths to capture opportunities

- **Formation of the Local Cultural Tourism Unit (UWAL):**
A community institution integrating traditional leaders and local youth to manage cultural tourism packages, guide incoming investments in alignment with local norms, and establish a joint promotional network with the Tourism Office.
- **Strengthening branding of authentic cultural tourism:**
Promote Mursala Island as a destination of *“Harmonious Nature and Culture”*, positioning cultural preservation as a unique selling point in niche tourism markets.

ST Strategy (Strength–Threat): Use strengths to counter threats

- **Implementation of a Local Tourism Code of Ethics (Community Charter):**
Developed jointly by the community and village authorities to regulate the behavior of tourists and businesses, ensuring respect for cultural values and environmental protection.
- **Integrate cultural and conservation education into all tourism activities:**
Make environmental and cultural preservation part of the tourist experience through educational and immersive packages, rather than mere decoration.

WO Strategy (Weakness–Opportunity): Address weaknesses using available opportunities

- Construct a simple multifunctional tourist pier:
A basic infrastructure proposal managed by the community to support fixed ferry schedules, potentially subsidized by the regional government.
- Provide training in homestay management and local culinary services:
In collaboration with training institutions and the Cooperative/MSME Office, to enable the community to fill infrastructure gaps through grassroots entrepreneurship.

WT Strategy (Weakness–Threat): Minimize weaknesses and avoid threats

- Zoning map for community-based tourism areas:
To prevent environmental exploitation and land conflicts, sacred cultural zones will be clearly demarcated and protected.
- Establishment of the Mursala Island Tourism Forum:
A collaborative platform involving community members, village government, local entrepreneurs, and the Tourism Office to jointly develop policies, schedules, and SOPs.

From the strategies outlined above, the two most realistic and feasible strategies that can be proposed in stages are: (1) the establishment of the Local Cultural Tourism Unit (UWAL) → This can be initiated through village deliberations and formalized by the village head. It can start with minimal funding and provide long-term benefits in strengthening local institutions; and (2) the construction of a simple pier and a fixed transportation schedule → This proposal can be submitted to the Regional Development Planning Agency (Bappeda) or the Department of Transportation under a village tourism priority funding scheme. The cost is relatively low, but the impact on accessibility is significant.

Discussion

This section aims to present the research findings in relation to the theoretical framework used and to compare them argumentatively with previous studies. This approach allows the research not only to explain field realities but also to validate or expand relevant scientific concepts in the context of sustainable coastal tourism planning.

The findings of this study indicate that the development of sustainable coastal tourism on Mursala Island is influenced by a number of interrelated internal and external factors. The key findings reveal that the community demonstrates a relatively high level of socio-cultural resilience (mean = 4.06), good participation (mean = 3.82), and an open attitude toward tourists, while infrastructure and accessibility remain major constraints requiring policy intervention. These findings are directly relevant to the core theories that form the basis of this research, namely sustainable development theory, community-based tourism (CBT) theory, and integrated tourism planning theory.

Contextually, these results support the principles of sustainable development theory (WCED, 1987), which emphasize the need for a balance between social, environmental, and economic aspirations. On Mursala Island, the continuity of customary values and local wisdom remains well-preserved despite increasing contact with tourists, as evidenced by the ongoing traditional rituals, the involvement of local leaders, and community efforts to maintain their culture. This aligns with the views of Gunn and Var (2021) and is reinforced by Cut Nuraini (2022), who emphasize that coastal development cannot be separated from local social structures and traditions, which serve as the backbone of area resilience.

From the perspective of Community-Based Tourism (CBT), active community participation is key to ensuring that tourism development remains localized. The research findings show a strong desire from the community to be involved, whether through informal activities such as environmental stewardship, hosting guests, or micro-enterprises. This is consistent with the findings of Sugiarto and Ramadania (2024), who state that CBT will succeed if communities are given space to act as the main agents. However, the absence of a formal participatory forum, as found in the interviews, indicates that CBT principles are still only partially applied in Mursala Island, highlighting the need to strengthen local institutions.

On the other hand, the results of this study confirm the importance of an integrated tourism planning approach, as put forth by Inskeep (2021) and Milanie (2024), who assert that the integration of infrastructure, transportation, and local institutions is a key prerequisite for successful coastal tourism. The relatively low average accessibility score (mean = 3.26) and community concerns regarding dependence on sea weather and the limited transportation

schedule emphasize the need for concrete strategies to establish a regular transportation system and a functional pier.

These findings also align with various previous studies. Nuraini et al. (2023) and Hidayat et al. (2023) argue that the success of coastal tourism development is largely determined by social support and the strength of the local community. Meanwhile, Sugiarto & Ramadania (2024) and Aini et al. (2023) highlight the importance of preserving cultural values and social space in all tourism planning, which is strongly reflected in the Mursala community. Linda et al. (2024) and Milanie (2024) also emphasize that social character and community interaction are vital assets in responding to external dynamics such as tourism, which appears to be the case on the ground. Similar views are expressed by Cheng et al. (2021) and Gunn & Var (2021), who place culture at the core of long-term tourism development.

Nevertheless, there are also some studies that differ from the findings in Mursala Island. For example, Purba et al. (2020) and Simanjuntak (2021) state that coastal communities tend to reject outsiders due to fears of cultural disruption. These findings contrast with the situation on Mursala Island, where the community is welcoming toward tourists and even utilizes their culture as a tourism attraction. Lubis and Hasibuan (2022) argue that low education levels hinder tourism involvement, but in Mursala, even though most respondents only graduated from high school or below, they still showed high enthusiasm to participate. Furthermore, Andiyan & Rahma (2023), who emphasize the dominance of private investors in coastal tourism development, present a contrast to the situation in Mursala Island, which favors a participatory and community-based approach to ensure sustainability and social equity.

In conclusion, Mursala Island possesses strong social and cultural capital to support sustainable tourism development, and the success of this area's development will largely depend on the ability of all stakeholders to design planning strategies that integrate local values, improve accessibility, and strengthen the institutional capacity of the community.

Synthesis of Findings

The results of this study generally indicate that the development of sustainable coastal tourism on Mursala Island has a strong foundation in terms of socio-cultural aspects and community participation. However, it still faces serious challenges regarding accessibility and infrastructure. The quantitative data show that the variable of local socio-cultural resilience (X1) obtained the highest score (mean = 4.06), and community participation (X3) also ranked high (mean = 3.82), indicating that community strength is a central element supporting tourism sustainability in this area.

The qualitative data support this conclusion. Interviews with traditional leaders and residents revealed that the community still actively practices cultural rituals such as mangupa, upholds collective values, and welcomes tourists with openness. Furthermore, many residents are informally involved in tourism activities despite the absence of formal institutions overseeing their participation. On the other hand, physical access limitations and the uncertainty of sea transport schedules (X4, mean = 3.26), along with the uneven distribution of basic tourism infrastructure (X2, mean = 3.61), stand out as critical issues requiring policy interventions tailored to local needs.

When these findings are linked to the literature, they reinforce the principles of Community-Based Tourism (CBT) and sustainable development theory, which emphasize the importance of active community engagement and the preservation of local culture as key foundations for developing destinations that are adaptive and protective of authentic values. Previous studies by Nuraini et al. (2023), Sugiarto & Ramadania (2024), and Cheng et al. (2021) also stress that community strength and local wisdom are primary determinants of long-term tourism success, particularly in coastal areas with high ecological and social sensitivity.

Further synthesis of the findings suggests that tourism development on Mursala Island will succeed if it prioritizes community strength, minimizes accessibility disparities, and enhances the capacity of local institutions. Among all the variables examined, the variable of Local Socio-Cultural Resilience toward Tourism (X1) can be concluded as the most strategic. This variable not only achieved the highest statistical value but also serves substantively as the primary safeguard against cultural commodification and social degradation that often accompany tourism development.

Therefore, the development strategy for sustainable coastal tourism on Mursala Island should focus on strengthening traditional institutional structures, integrating cultural preservation into tourism packages, and creating participatory spaces that meaningfully involve all elements of the local community.

6. Conclusions

Based on the quantitative and qualitative analyses presented in Chapter IV, it can be concluded that the development of sustainable coastal tourism on Mursala Island holds significant potential, strongly supported by the community's socio-cultural conditions. The community demonstrates a high level of socio-cultural resilience, as evidenced by the continued practice of traditional customs and openness to tourists, making this variable the most strategic factor in supporting tourism development. In addition, community participation is categorized as high, although it has yet to be accommodated within a formal and consistently functioning institutional framework. Tourism infrastructure is considered moderately available but remains unevenly distributed, while accessibility poses a major challenge that requires special attention. Overall, the community perceives the tourism development potential as promising, although it still requires integrative planning rooted in local strengths.

In general, the Community-Based Tourism (CBT) approach—which emphasizes active community participation, cultural preservation, and local resource management—is considered the most relevant approach for implementation on Mursala Island. With strategies that integrate field observations, community aspirations, and current conditions, Mursala Island can be developed into a coastal tourism destination that is not only naturally beautiful but also socially and culturally sustainable.

Based on these conclusions, several strategic and practical recommendations can be proposed for implementation by local governments, tourism managers, and the local community: (1) Strengthening Local Institutions through the establishment of a Local Customary Tourism Unit (UWAL): Village authorities and traditional leaders should establish a formal institution to oversee participatory tourism management. UWAL could serve as a guide, manager of cultural tourism packages, and enforcer of visitor norms and ethics on Mursala Island; (2) Development of a Pier and Fixed Sea Transportation Schedule: The Central Tapanuli Regency Government and the Department of Transportation should provide transport infrastructure in the form of a multifunctional pier and establish a regular boat schedule to Mursala Island. This is essential for ensuring accessibility and comfort for tourists, while also supporting community mobility; (3) Issuance of a Village Regulation on Culture-Based Tourism: The village government is advised to draft a Village Regulation (Perdes) that governs the management of culture-based tourism, including prohibitions against tourist activities that harm local values and the environment. This regulation could serve as a legal instrument for community protection and a means of controlling external investors; (4) Training and Mentoring for Community-Based Tourism Enterprises: Training institutions and related agencies should organize training on homestay management, local culinary services, digital marketing, and tourism services for the community. Ongoing assistance will improve service quality and expand opportunities for community members to become key players in tourism; and (5) Integration of Cultural Preservation into Tourism Packages: Cultural preservation should not be treated as a supplementary element, but rather as a central part of the tourism experience. Traditional rituals, folklore, and local customs can be packaged into educational attractions that are engaging without losing their original meaning.

Through the implementation of these strategies, the development of Mursala Island as a sustainable coastal tourism destination can be realized in a gradual and comprehensive manner. Planning that actively involves the community, respects local cultural values, and improves accessibility will transform the island not only into a tourist destination but also into a model of fair, inclusive, and sustainable tourism development in Indonesia's coastal regions.

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