

EFFORTS TO ADDRESS ISSUE IN ECOTOURISM IN SICANANG ISLAND VILLAGE, MEDAN BELAWAN DISTRICT

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ABSTRACT

Sicanang Mangrove Ecotourism offers significant potential to strengthen the local economy and contribute to coastal habitat conservation in Pulau Sicanang Village, Medan Belawan Regency. However, significant barriers to its expansion exist, including waste accumulation, illegal logging, infrastructure damage, and the closure of tourist destinations. This study employed a qualitative descriptive approach, employing observations, semi-structured interviews with village officials, community leaders, and community members, and field documentation analyzed using data reduction, presentation, and conclusion drawing techniques, and validated through triangulation of sources and methods. The results indicate that the main causes of ecotourism problems include unclear governance, lack of government support, and lack of community awareness. Cooperative solutions involving infrastructure improvements, mangrove regeneration, and the formation of community-based management groups are needed to promote professional, sustainable, and participatory ecotourism.

Keywords: *Ecotourism, Mangrove, Sicanang, Problems, Conservation*

INTRODUCTION

As a country with extraordinary biodiversity and extraordinary terrestrial and marine natural resources, Indonesia offers significant potential for the growth of ecotourism in various sectors. In many countries, including Indonesia, ecotourism, which combines tourism and conservation, has emerged as a crucial sustainable development tactic. The idea behind ecotourism is to manage tourist destinations by prioritizing environmental sustainability and the well-being of local communities, over the pursuit of financial gain. Therefore, ecotourism is seen as a crucial instrument for achieving a balance between natural resource utilization and environmental conservation initiatives.

One of the many popular types of ecotourism is mangrove ecotourism. Indonesia has 3,490,000 hectares of mangrove forests, accounting for 21% of the world's total (Marbun et al., 2022). Indonesia's vast mangrove forests present a highly promising opportunity for the development of mangrove ecotourism. Mangrove forests in Indonesia serve several important ecological functions, including serving as a vital home for diverse marine life, efficient carbon sinks, and organic barriers that protect coastal areas from erosion and seawater intrusion. With more than one-fifth of the world's mangrove area, Indonesia is one of the countries with the greatest mangrove ecotourism potential (Maesti et al., 2022).

In many coastal areas, communities depend on mangroves as a source of building materials, fuel, traditional medicines, and food. In addition, mangrove ecosystems also have important cultural and spiritual values for local communities, as they are an integral part of their identity and life (Harefa et al., 2024). Therefore, mangrove conservation efforts not only impact environmental sustainability, but also the well-being and survival of coastal communities as a whole. This opportunity is a great opportunity to create a unique ecotourism model that distinguishes it from other natural tourism destinations because it allows visitors to travel while learning about ecosystems, coastal culture, and the importance of conservation.

Mangrove ecotourism in Indonesia has been widely studied in various fields. Research by Syakira, A., & Zulkarnaini, Z. (2025) on the development of mangrove ecotourism in East Lombok,

for example, shows that collaboration between the government, communities, and academics is crucial for enhancing the attractiveness of conservation-based tourism. Meanwhile, Fifiyanti & Damanik (2021) studied mangrove ecotourism in Bengkalis Regency and found that key elements of successful ecotourism management are strengthening facilities, promoting local culture, and engaging the community. These studies demonstrate that, in addition to providing financial benefits, mangrove ecotourism serves as a vehicle for environmental education and strengthening local identity.

Although numerous studies on mangrove ecotourism have been conducted throughout Indonesia, relatively few have focused on Sicanang Island, Medan Belawan Regency. Previously, Sicanang Island's 178.24-hectare mangrove forest served as a recreational and educational destination for tourists. The unique coastal culture and beauty of the mangrove habitat attracted many domestic and international tourists to the area before the COVID-19 outbreak. Fishermen, traders, and tourism service providers in particular benefit economically from tourism (Siregar & Elfikri, 2022).

Since the COVID-19 outbreak, which halted nearly all tourism activities and sparked a dispute over ownership of the mangrove tourism area as private property, the Sicanang mangrove ecotourism sector has unfortunately seen a drastic decline in visitor numbers. In an effort to exacerbate the ecotourism problem and negatively impact the local economy, the local government has even temporarily closed the area. This restriction has created uncertainty for communities who have traditionally relied on tourism for their livelihoods, while also limiting access for tourists.

Several significant issues have emerged from this situation. First, the sustainability of the mangrove ecosystem is threatened by the lack of consistent cooperative management. Second, the community is denying the potential economic benefits of ecotourism. Third, social unrest has arisen due to unresolved land issues. Fourth, the lack of a post-pandemic recovery plan has left the local government and community uncertain about how to revive Sicanang ecotourism. These issues indicate that many questions remain regarding the state of ecotourism on Sicanang Island.

The research gaps in question are multifaceted. First, specific research detailing the ecological, social, and economic conditions of Sicanang ecotourism post-outbreak is still lacking. Second, research on local residents' perceptions of ecotourism area remanagement plans is still limited, despite community involvement being crucial for the sustainability of community-based ecotourism. Third, the most effective policy strategies for revitalizing Sicanang ecotourism remain uncertain due to the lack of empirically supported recommendations that can be used by local governments and other relevant stakeholders as guidance (Marbun et al., 2022).

This study aims to address this gap by analyzing several strategies that can be used to address ecotourism challenges on Sicanang Island. More specifically, the study aims to: (1) determine the post-pandemic condition of Sicanang Island's mangrove ecosystem; (2) evaluate community and stakeholder perceptions of the re-management of the ecotourism area; and (3) formulate policy recommendations that can serve as guidelines for the recovery and expansion of sustainability-based ecotourism.

By examining ecotourism issues on Sicanang Island in depth, this study is expected to increase knowledge about mangrove ecotourism, particularly in a post-pandemic environment. Furthermore, this research is expected to have practical applications, providing concrete advice to the government, local communities, and other stakeholders on how to develop inclusive, successful, and sustainable recovery programs.

METHOD

Using a qualitative descriptive approach, this study aims to deeply understand various issues related to mangrove-based ecotourism in Pulau Sicanang Village, Medan Belawan District. The research location was specifically selected because it is one of the most popular ecotourism destinations in Medan City and has institutional, social, and environmental issues. The study lasted for three days, namely on March 7–9, 2025. Because the purpose of this study was to analyze

contextual data carefully, rather than making broad generalizations, this very short research period was deemed adequate. The researcher used a triangulation strategy of sources and methods within this limited time frame so that the data obtained could still indicate the issues discussed.

Based on their background and level of understanding of ecotourism management, research participants were selected using a purposive sampling technique. Key informants consisted of five community members involved in ecotourism management groups, two village officials directly involved in environmental management policies, and three community leaders familiar with the area's history and social dynamics. Informant selection required direct involvement in ecotourism activities, a minimum of five years of experience living in the research area, and a willingness to share information openly.

A documentation study was conducted using field photographs, activity archives, and secondary data related to the Sicanang ecotourism program. Participant observation was used to document environmental conditions and ecotourism facilities; and semi-structured interviews were used to explore community perceptions, experiences, and expectations. Field notes to record observations and interview protocols with open-ended questions regarding management issues, community involvement, and government assistance were among the research tools used.

Data reduction, data presentation, and conclusion preparation are the three stages of interactive data analysis that have been completed. The research method was facilitated by the use of coding techniques to combine important themes that emerged from observations and interviews. By comparing interview results from various informant groups and validating information from observations and documentation, triangulation was used to ensure data accuracy. Therefore, despite the relatively short research period, the combination of a deliberate sampling process, focused data collection tools, and triangulation methodology allowed for a clear and comprehensive picture of ecotourism issues on Sicanang Island.

RESULTS AND DISCUSSION

Currently, several obstacles hinder the development of mangrove ecotourism in the coastal area of Belawan Sicanang. This problem is exacerbated by various community activities that have the potential to degrade the condition of the mangrove ecosystem. In the Sicanang Mangrove Ecotourism Area, Pulau Sicanang Village, Medan Belawan District, Medan City, several practices have been found that impact environmental sustainability. These activities include:

1. Trash found in the mangrove forest

The presence of household waste in the mangrove forest area of Sicanang Island provides clear evidence that local residents remain largely unaware of the importance of proper household waste management. Observations indicate that the majority of the waste consists of single-use plastics, particularly plastic bottles and shopping bags, which are commonly carried and discarded during household or daily activities. The prevalence of such inorganic waste not only reflects insufficient environmental awareness but also reveals the absence of effective waste management systems within the community.

From an ecological perspective, the accumulation of plastic waste in mangrove ecosystems presents a serious threat to their natural functioning. Plastic debris scattered on the forest floor can obstruct the growth and regeneration of mangrove species. In particular, seedlings and propagules are often trapped or covered by plastic layers, which reduces their ability to reach the soil and establish roots. As a result, the germination process is disrupted, and the likelihood of successful seedling establishment decreases significantly. Over time, these conditions lead to a lower regeneration rate of mangroves, which are crucial for maintaining coastal stability and biodiversity.

This disruption in natural regeneration has broader implications for the coastal environment. Mangrove forests serve as protective barriers against erosion, nurseries for marine species, and carbon sinks essential for climate regulation. When their regeneration is impeded by plastic waste, the resilience of the entire coastal ecosystem is undermined. Consequently, the degradation of mangrove forests caused by unmanaged waste not only threatens ecological balance but also

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jeopardizes the sustainability of livelihoods for coastal communities who depend on fisheries and other mangrove-related resources.

The persistence of plastic waste within the Sicanang Island mangrove area demonstrates a pressing need for increased public awareness, stronger waste management practices, and targeted interventions aimed at reducing single-use plastics. Without these measures, the ongoing accumulation of inorganic waste will continue to compromise mangrove regeneration and, by extension, the health of the wider coastal ecosystem.

2. Illegal Logging of Mangrove Forest Occurs

Figure 1. Inorganic waste was found at the research site.

Source: (by Author)



Illegal logging of mangroves has emerged as a pressing challenge in the Sicanang Mangrove Ecotourism area, with evidence showing a significant increase in such activities following the closure of the tourist site in 2020. During the period when ecotourism was active and open to the public, the presence of structured management, monitoring mechanisms, and regular visitor activities acted as an indirect safeguard for the mangrove ecosystem. Ecotourism thus functioned as a socio-ecological approach that not only generated economic benefits for local communities but also provided a form of social surveillance, reducing opportunities for illegal extraction of mangrove resources. The suspension of ecotourism activities effectively removed these layers of control, leaving the mangrove area vulnerable and accessible to unrestricted exploitation.

This development highlights the critical role of ecotourism management in balancing both economic viability and environmental sustainability. The absence of consistent oversight and protective measures has led to unsustainable practices that directly accelerate the decline of mangrove tree cover and the overall health of the ecosystem. Such degradation poses serious risks, as mangroves provide essential ecological services that extend far beyond the local environment. They act as natural barriers against coastal abrasion, serve as vital breeding and nursery grounds for aquatic organisms, and play a significant role as carbon sinks in mitigating the impacts of climate change.

If illegal logging in Sicanang is not urgently addressed, the long-term consequences could extend well beyond localized forest loss. The continued depletion of mangroves threatens to destabilize coastal ecosystems, weaken natural defenses against rising sea levels and storm surges, and diminish biodiversity that is dependent on mangrove habitats. Moreover, the erosion of ecological functions would undermine the potential for ecotourism revival, thereby reducing opportunities for sustainable community livelihoods.

In this context, the phenomenon of increasing illegal logging underscores the necessity of re-establishing strong and adaptive ecotourism management systems. Effective governance of ecotourism areas must integrate environmental conservation with socioeconomic incentives for local communities, ensuring that protective functions are maintained even during periods of reduced tourism activity. Without such interventions, the ecological and economic foundations of the Sicanang mangrove ecosystem will continue to erode, with implications that are both immediate and far-reaching.

3. Closure of Sicanang Mangrove Ecotourism

The Sicanang Mangrove Ecotourism Area in Medan Belawan was initially a popular tourist destination. It was used for environmental education and research, as well as recreation. However, the ecotourism area was closed in 2020 due to several issues with its sustainable management (Restu et al., 2024). The primary reason for the closure was a lack of public awareness and appreciation of the importance of preserving mangrove ecosystems. This aligns with ecotourism research, which emphasizes that mangrove forest damage is typically caused by human activities such as resource exploitation and inadequate participatory management.

The lack of collaboration between the government, local communities, and other stakeholders exacerbates the situation. Due to the lack of institutional support to maintain tourism services and the lack of community involvement, infrastructure is in poor condition. Several infrastructure elements, such as wooden bridges and guest houses, have been observed to be damaged and no longer function as effectively as before. This story demonstrates the failure of ecotourism management, which should prioritize conservation, community empowerment, and local economic sustainability.



Figure 2 Damaged Ecotourism Facilities (bridge)

Source: (By Author)

According to community source S. Lubis, the mangrove ecotourism area in Pulau Sicanang Village was still operating optimally as an educational tourism destination before 2020. Both schoolchildren and university students frequently visited this location for field trips and mangrove ecology studies. With various supporting facilities, such as a selfie area, treehouse, dining area, and public restrooms, this ecotourism destination serves as a learning center and attracts general tourists.

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The presence of these facilities demonstrates that ecotourism management has succeeded in providing a pleasant and informative experience for visitors.

However, during the COVID-19 pandemic, this trend has changed significantly. Ecotourism manager Rasmiono claims that the government has neglected the management of the area since the outbreak began. This lack of maintenance has caused significant losses for many organizations that once supported tourism and education. Treehouses, a popular tourist destination, are no longer maintained and inaccessible to visitors, and bridges that were once the primary means of tourists enjoying the expansive mangrove forest views have collapsed. Ecotourism management has become increasingly difficult with increasing property claims from local residents who consider the mangrove forest area to be ancestral land.

These field findings lead to the conclusion that the primary causes of the post-pandemic decline in the quality of the Sicanang Mangrove Ecotourism area are the government's lack of commitment to infrastructure maintenance and a lack of public awareness of the importance of managing and preserving the area's tourism potential. The combination of these two factors has led to infrastructure degradation and a decline in the ecotourism's ability to attract large numbers of visitors as a destination for recreation, education, and conservation.



Figure 3 Damaged ecotourism facilities (tree houses)

Source: (by Author)

There are substantial challenges associated with the tourism infrastructure in Sicanang, extending far beyond the condition of the natural ecosystem that serves as the area's primary attraction. One of the most pressing concerns lies in the availability and functionality of basic facilities, particularly public restrooms. These facilities, which are essential to ensuring the comfort and satisfaction of visitors, are currently inoperative due to extensive physical damage. The absence of well-functioning sanitation amenities not only inconveniences tourists but also undermines the overall quality of the visitor experience.

Furthermore, the presence of dilapidated and poorly maintained buildings around the site conveys an unfavorable image and may leave tourists with the impression that the destination is neglected or lacks proper management. Such conditions can significantly diminish visitors' sense of comfort and satisfaction, thereby reducing the likelihood of return visits and discouraging positive word-of-mouth promotion. In destinations that market themselves as sustainable or community-based ecotourism sites, the physical appearance and upkeep of infrastructure play a crucial role in reinforcing the credibility of those claims.

The inadequacy of sanitation and supporting facilities not only tarnishes Sicanang's image as an ecotourism destination but also contradicts the very principles of environmental stewardship and sustainability on which its development is presumably based. This situation weakens the site's

competitiveness in the broader tourism market, where visitors increasingly demand destinations that can balance natural beauty with modern comfort, safety, and cleanliness. Unless addressed through systematic investment, maintenance, and management, such shortcomings in infrastructure risk marginalizing Sicanang as a credible ecotourism destination and limiting its potential contribution to sustainable community development.



Figure 4. Ecotourism facilities (toilets) are damaged
Source: (by Author)

Residents of Pulau Sicanang Village are optimistic that the government will soon address the ecological condition of the local mangroves. In addition to restoring the natural function of the coastal area, mangrove rehabilitation is crucial for the revival of the Sicanang Mangrove Ecotourism as a public space that benefits both local residents and international tourists. By providing biological resources, protecting the coastline, and encouraging nature-based tourism, mangrove ecosystems have proven crucial in enhancing the economic viability of coastal towns. Therefore, there is a close relationship between the overall restoration of the mangrove environment and initiatives to revitalize ecotourism on Pulau Sicanang. Given these challenges, an integrated approach that combines ecological, social, and economic factors is crucial. To ensure the sustainability of ecotourism and improve the well-being of coastal communities, several ideas for sustainable mangrove utilization have been proposed. The following are some suggested solutions:

a. Reorganization of coastal areas in Pulau Sicanang Village

The preservation of the mangrove ecosystem in the coastal areas of Sicanang Island requires a collaborative and multi-stakeholder approach that actively involves the local government, environmental organizations such as Yagasu and Yakopi, and the coastal communities whose livelihoods and environmental well-being are directly dependent on the sustainability of this ecosystem. The complexity of ecological challenges in mangrove areas ranging from deforestation and land conversion to the pressures of tourism and urban expansion cannot be addressed by a single institution alone. Therefore, the establishment of open and inclusive discussion forums is vital. These forums would serve as platforms for dialogue, negotiation, and consensus-building, where diverse stakeholders can articulate their perspectives, identify shared concerns, and design joint projects that align conservation objectives with community needs.

Restoration and expansion of mangrove ecotourism should be prioritized through comprehensive planning led by government agencies in collaboration with non-governmental organizations. Such plans need to include systematic programs for the rehabilitation of

degraded mangrove areas, focusing on the repair and replanting of damaged trees, the establishment of nursery facilities, and long-term monitoring of growth and survival rates. Importantly, the active participation of local communities in these initiatives must be ensured, not only as beneficiaries but also as key actors in conservation. Their direct involvement fosters a sense of shared responsibility and ownership, while simultaneously increasing awareness of the legal and institutional frameworks governing mangrove areas. This includes clarifying the official legal status of the ecosystem, which is under the authority of the government but supported by conservation agencies tasked with ensuring sustainable management.

In addition, collaborative forums should address the spatial and legal dimensions of ecotourism development. One crucial step is the precise delineation of permissible settlement boundaries, which can mitigate future conflicts, particularly those related to land tenure and tourism expansion. Clear boundaries and land-use agreements prevent overlapping claims that often undermine conservation efforts. Moreover, the adoption of collective agreements on conservation measures should include the establishment and enforcement of strict legal sanctions for violations such as illegal logging, which poses one of the greatest threats to mangrove sustainability. These sanctions must be accompanied by consistent monitoring and fair enforcement to ensure compliance while protecting the rights and interests of local residents.

Ultimately, the strength of this collaborative governance model lies in its capacity to balance ecological sustainability with social equity. By combining the technical expertise of conservation organizations, the regulatory authority of government institutions, and the traditional knowledge and lived experiences of local communities, mangrove governance in Sicanang Island can evolve into a system that is more sustainable, egalitarian, and consensus-based. Such an approach not only enhances ecological resilience but also generates long-term socio-economic benefits for all stakeholders, ensuring that the mangrove ecosystem continues to provide critical services for present and future generations.

b. Implementation of replanting of mangrove trees

Communities in many coastal areas continue to engage in illegal logging, primarily driven by short-term economic needs. Such practices, however, result in severe ecological degradation, particularly through the destruction of mangrove ecosystems. The impacts of mangrove loss extend far beyond the immediate reduction in tree cover. Mangroves play a critical ecological role as natural barriers that protect coastlines from the destructive forces of nature. Their removal significantly reduces the ability of coastal areas to withstand natural disasters, leaving communities increasingly vulnerable to the risks posed by rising sea levels, storm surges, and coastal erosion. Given these conditions, mangrove restoration must be regarded as a strategic environmental priority. The rehabilitation of mangroves in Belawan Sicanang Village, for instance, is not only intended to revive the village's reputation as a sustainable mangrove-based tourism destination but also to reinforce the resilience of the local environment in the face of climate change and coastal degradation.

Another vital objective of mangrove rehabilitation is the reduction of disaster risks in coastal regions. The vulnerability of Belawan Beach was made evident in early October 2022, when the area was inundated by floodwaters reaching a height of 2.7 meters (Barita Lumbanbatu, 2023). This event highlights the acute exposure of coastal settlements to hydrometeorological hazards. In this context, mangrove planting emerges as an ecological intervention with multiple protective functions. Mangrove forests act as natural windbreaks and wave breakers, effectively reducing the energy of storms and tidal waves. They also play a critical role in sediment stabilization, control seawater infiltration into inland areas, and serve as buffers against coastal erosion and tidal flooding (Syah, 2020). By re-establishing these functions, mangrove restoration provides a low-cost, nature-based solution to disaster risk

reduction, complementing engineering and infrastructural approaches.

Beyond their ecological functions, mangroves also contribute substantially to the improvement of local livelihoods. Restored mangrove ecosystems create habitats that support diverse species of fish, crustaceans, and mollusks, thereby enhancing the productivity of both aquaculture and capture fisheries. This expansion of marine biodiversity directly benefits coastal communities by creating opportunities for alternative income generation and strengthening food security. Furthermore, the sustainable use of mangrove ecosystems, such as ecotourism development, honey production, or handicrafts derived from mangrove products, can provide long-term economic benefits that are more stable and resilient compared to income derived from destructive practices like illegal logging (Wahyudi, 2022).

mangrove restoration in Belawan Sicanang Village represents a comprehensive strategy that simultaneously addresses ecological, social, and economic challenges. It offers a pathway to rebuild degraded ecosystems, enhance resilience against climate-related hazards, and secure sustainable livelihoods for coastal residents. As such, the success of these initiatives will depend not only on the physical act of replanting but also on the integration of community participation, policy support, and long-term monitoring to ensure that restored mangroves can continue to deliver environmental and socioeconomic benefits for generations to come.

c. Maintenance

Mangrove ecosystem destruction is a significant problem on Sicanang Island. One of the main causes is illegal logging of mangrove trees by several communities, followed by the conversion of mangrove forests into fish and shrimp ponds. This aligns with the findings of Munasikhah (2021), who found that since the 1980s, when mangrove forests were converted for fish farming, large-scale mangrove logging has occurred to meet industrial needs. This practice not only damages the ecosystem but also jeopardizes the ecological function of mangroves as a food source for coastal residents, ensuring the long-term survival of the population.

One deliberate step to reduce the burden on this area is to protect and manage ecotourism that focuses on mangroves. Effective management, particularly of supporting facilities such as gazebos, access roads, and other tourism infrastructure, can facilitate area monitoring. When ecotourism sites are maintained and accessible to the public, visitors and managers will more easily identify illegal activities such as illegal logging and land conversion. However, the permanent closure of tourist attractions can also encourage criminal behavior due to the lack of social oversight in the area.

Mangroves provide food, shelter, and breeding grounds for marine life such as fish, crabs, and shrimp, making them a vital ecosystem (Wahyudi, 2022). Therefore, maintaining the sustainability of mangrove ecosystems cannot be left to one party alone. Local governments, non-governmental organizations such as Yagasu, and local communities must work together in a participatory collaborative framework to ensure mangrove protection and sustainable ecotourism (Handayani et al., 2023).

CONCLUSION

The Sicanang Mangrove Ecotourism Area holds significant ecological and economic potential, but management issues such as waste accumulation, illegal logging, and the closure of tourist attractions persist. These issues limit the economic opportunities for coastal communities dependent on ecotourism and accelerate ecosystem degradation. To implement conservation efforts, the government, local communities, and non-governmental organizations such as Yagasu and Yakopi must collaborate. Key strategies include routine maintenance, strengthening local institutions, and mangrove restoration to restore the area. Community-based management organizations can ensure the sustainability of conservation efforts while creating economic opportunities. With more informed

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and active ecotourism management, the area has the potential to recover biologically and become a leading tourist destination. Examples of nature-based activities that can support conservation while improving the livelihoods of local residents include mangrove tourism, kayaking, and wildlife watching.

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