



Empowerment Strategies for the Community in the Mangrove Ecotourism Area through Creativity in Sei Nagalawan Village, Serdang Bedagai Regency, Indonesia

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

This research aims to explore the potential and empowerment of the community through creative economy in the ecotourism area of Sei Nagalawan Village, Serdang Bedagai Regency. By employing a triangulation data approach, various perspectives were obtained, including insights from experts in the Faculty of Forestry at the University of Sumatera Utara. The ecotourism area offers natural attractions like mangroves, unique processed products, and the phenomenon of shifting sands. The central role in community empowerment is held by the Mangrove Conservation Group of Muara Baimbai. Through SWOT analysis, the study identified several influencing factors,

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such as group institution support, limited government assistance, and underutilization of technology in marketing. The research findings indicate that ecotourism has a positive impact on the local economy and community well-being, but there are still obstacles to overcome. The significance of this research lies in providing support for ecotourism management through empowerment strategies, including technological utilization, expanding partnership networks, and enhancing human resource competencies. The conclusion emphasizes the need for greater government support, effective technology utilization, and a holistic approach to environmental conservation and community empowerment for sustainable development in the ecotourism area.

Keywords: Mangrove; sei nagalawan; ecotourism; community empowerment; creative economy.

1. INTRODUCTION

Indonesia, as the world's largest archipelagic country, comprises approximately 17,500 islands with a coastline spanning 81,000 km. The majority of Indonesia's territory consists of coastal areas, acting as a transition between the sea and land, influenced by various activities and phenomena both on land and at sea [1,2,3]. Phenomena such as urban development, aquaculture, and land clearance for agriculture on land can impact the sea. Conversely, tidal fluctuations, coastal erosion, and sea storms can affect life on land [4].

Serdang Bedagai Regency, with a 3,700 Ha mangrove ecosystem, includes the Perbaungan Subdistrict, where Sei Nagalawan Village has a mangrove forest ecosystem covering approximately 20 ha, with 7 ha designated for tourism. The management of mangrove tourism is carried out by local community groups and economic elites [5].

Rehabilitating mangrove forests is a vital strategy for preserving coastal ecosystems and resources. Mangrove forests, growing in brackish swamps along the coastline, hold significant potential for enhancing the economy of coastal communities. With biological, economic, and tourism benefits, mangrove forests are valuable biodiversity resources. The development of mangrove forests as ecotourism areas not only educates visitors but also contributes to conservation through mangrove seedling planting activities.

Creative economy is a concept that places creativity and knowledge as primary assets in driving the economy. The creative economy is an economic development based on the skills, creativity, and talents of individuals to create economic value, emphasizing the development of ideas in generating value [6,7].

A study on ecotourism development by Tausikal [8] emphasizes the need for strategies in developing Nitanghahai Beach ecotourism in Morela Village, Central Maluku Regency, including ecotourism utilization, community empowerment, land management, facility development, and cross-sector coordination. In contrast, Mahmudah et al. [9] highlight community empowerment strategies in mangrove forest management through persuasive, educational, and facilitative approaches in business partnerships.

However, the strategic role of communities in increasing creative economic income in mangrove tourism remains underexplored. Therefore, this research aims to explore the empowerment process of coastal communities through creative economy in Sei Nagawalan Village, Serdang Bedagai Regency. This study discussed supporting factors, obstacles, and strategies in creative economic empowerment, with the hope of boosting local tourism visits and making the mangrove region a sustainable tourism destination.

2. METHODS

This research is conducted in Sei Nagawalan Village, Serdang Bedagai Regency, specifically in the Coastal Area of Nipah Village Sei Nagalawan, Perbaungan Subdistrict, with a duration from January 2023 to March 2023.

The research method employed is qualitative, adopting a post-positivist approach and a qualitative descriptive design. The focus is on the mangrove ecotourism of Nipah Village. The research object involves stakeholders related to community empowerment in the ecotourism area of Sei Nagawalan Village. Data is collected primarily through interviews and secondarily from previous research, statistical data, and other sources.

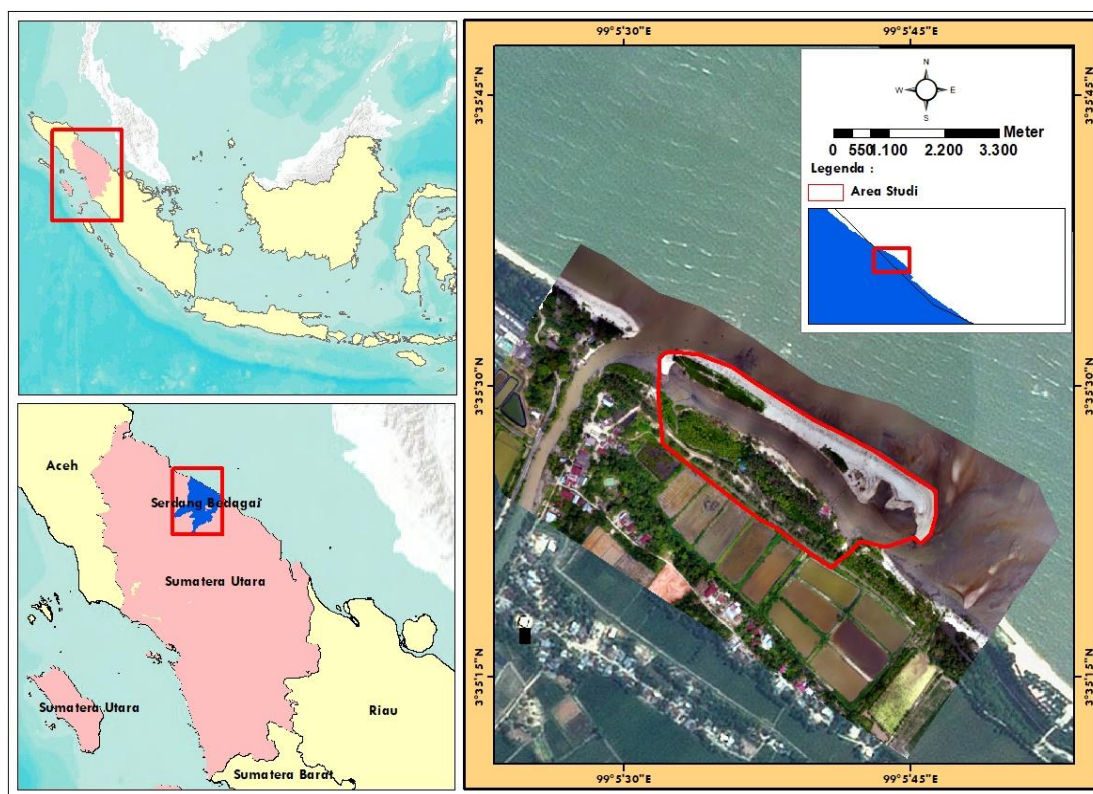


Fig. 1. Research location

2.1 Data Process

The genesis of this study traces back to the researcher's initial engagement as a visitor to the mangrove ecotourism site in Sei Nagawalan Village. The researcher's interest was subsequently piqued, leading to a comprehensive investigation into community empowerment strategies through the lens of creative economy in this locale, situated within Serdang Bedagai Regency. The preliminary phase involved a pre-research endeavor, entailing meticulous observation of the mangrove ecotourism dynamics in Sei Nagawalan Village, conducted diligently from July to November 2022. This observational period served as the bedrock for the identification of pertinent informants.

Four principal informants played pivotal roles in the study. Sutrisno, as the Chairman of the Mangrove Conservation Group in Muara Baimbai, offered profound insights into mangrove conservation efforts. Mahyaruddin Salim, in his capacity as the Village Head of Sei Nagawalan, contributed an administrative perspective and insights into the village government's support for ecotourism initiatives. Fajar Moertyansyah, representing the youth group, provided the study

with the unique viewpoint of the younger generation regarding mangrove ecotourism. Additionally, input from visitors, observers, and media figures enriched the research with diverse perspectives on the impacts of mangrove ecotourism.

Research methodology encompassed non-participant observation, drone-assisted mapping of the ecotourism site, Focus Group Discussions (FGD), direct observation, and in-depth interviews. The data collection process spanned six months, with an additional three months allocated for report writing, during which the unpredictable weather conditions emerged as a notable challenge.

The findings of the research centered on the outcomes derived from the reduction of gathered data, subsequently elucidated and categorized in alignment with the study's objectives. These findings encapsulated the strategies employed for community empowerment through the creative economy in Sei Nagawalan Village. By engaging key stakeholders who wield substantial influence in the realm of ecotourism, this research aspires to furnish a holistic portrayal of the impacts and efficacy of mangrove ecotourism in the specified locality.

Table 1. Internal factor dan external factor

Internal Factor	Tourism Attractions	Products or	Tourism products in the form of natural attractions Tourism products in the form of creative works
	Price		Price of services/products provided in the form of creative works
	Ecotourism Area Conditions		Access to the area Presented tourist attractions Availability of facilities and infrastructure Support facilities
	Ecotourism Institutions		Availability of ecotourism institutions
	Promotion		Availability of promotional media Utilization and creativity in media for promotion
	Human Resources		Management of the tourism area Management of creative economy products
External Factor	Government Policies		Government's participation or support in ecotourism development
	Social Conditions of the Community		Community interest and tendencies in tourism
	Economic Conditions of the Community		Community visits and purchasing power
	Technology		Application of information technology

2.2 Data Analysis

Data analysis includes data reduction, presenting data through various visual forms, and drawing conclusions. The SWOT analysis technique is utilized to formulate ecotourism development strategies. This research integrates modern technology and direct interaction through interviews and observation to provide a comprehensive overview of the mangrove ecotourism in Sei Nagawalan Village.

3. RESULTS AND DISCUSSION

The research was conducted in Nipah Village, Sei Nagalawan, Serdang Bedagai Regency, which underwent a transformation from critical land due to mangrove forest destruction to an ecotourism destination. This area is bordered by the Malacca Strait to the north, the third hamlet of Sei Nagalawan Village to the south, and mangrove forests to the east.

3.1 Potential of the Mangrove Ecotourism Area in Sei Nagalawan Village

In 2014, Sei Nagalawan Village had a total population of 3,051, predominantly fishermen, with a gender balance and a majority adhering to Islam. The 2-hectare mangrove forest area in Nipah Village, managed by the Mangrove Conservation Group of Muara Baimbai, obtained a management permit from the Ministry of Environment and Forestry (KLHK).

Mangrove Ecotourism in Sei Nagalawan Village has become the main source of livelihood for the residents. In addition to educational tourism activities, there are beach facilities, homestays, public toilets, and a cafeteria. A Savings and Loan Business Unit was established to provide business capital to group members. The catch of fishermen is managed independently, sold to operators, and the profits serve as savings for the fishermen.

The Mangrove Conservation Group of Muara Baimbai also processes products such as screw pine tea, mangrove fruit syrup, bullet tuna crackers, screw pine crackers, and sedge bags. The distinctive cuisine of Sei Nagalawan Village is also a draw for ecotourism visitors. Drone mapping provides an overview of the physical conditions and facilities of the tourism area.

Several ecotourism facilities are available at Sei Nagalawan Mangrove Beach. These facilities or infrastructure were built gradually, with most existing before the issuance of the IUPHKm by KLHK. The visible facilities on-site include 14 types, as shown in the following Table 2.

Based on aerial photo analysis, the total managed area covers 7.83 hectares, including mangrove forest areas, pine forests, parking areas, white sand (raised land), and other areas. This area increased as the managers of Sei Nagalawan Mangrove Beach also manage water areas outside their jurisdiction, including white sand expanses and water bodies beyond their managed area, as well as land belonging to group members used for tourism facilities. Spatial analysis found 10 types of land use in the Sei Nagalawan Mangrove Beach area. The details of each type of land use in the Sei Nagalawan Mangrove Beach area are displayed in Table 3.

Sei Nagalawan Mangrove Beach offers several tourist attractions that are the main draws for visitors. Natural scenery, raised land phenomena, educational objects, and various additional attractions make this location unique and appealing. The natural scenery of the beach, mangrove forest, and white sand is a prominent natural attraction, creating a captivating tourist experience.

The raised land phenomenon with shifting white sand is a unique attraction of Sei Nagalawan Mangrove Beach. This raised land is covered with green creeping plants, adding to the beauty of the white sand attraction. The uniqueness of this phenomenon captures the attention of visitors and serves as a special attraction that distinguishes this location from other tourist destinations.

Moreover, the mangrove forest in this location serves not only as a natural attraction but also as an educational object. The mangrove forest has become a learning space for various educational institutions and community groups. The successful rehabilitation of the mangrove forest since 2010 has restored the forest's functions, provided environmental services, and created tourist attractions.



Fig. 2. Boundaries of the permitted area, potential attractions, and ecotourism facilities at Sei Nagalawan Mangrove Beach captured utilizing the DJI Mavic 2 Pro drone

Table 2. Ecotourism facilities at Sei Nagalawan Mangrove Beach

No.	Description	Longitude	Latitude
1	Café (Dining Place)	99.094520	3.589894
2	Photo Spot	99.094520	3.589894
3	Camping Ground	99.094644	3.589947
4	Bridge	99.094620	3.589910
5	Gazebo 1	99.094476	3.590064
6	Camping Ground	99.094372	3.590037
7	Photo Spot	99.094372	3.590037
8	Mess/Glamping	99.094146	3.500196
9	Gazebo 2	99.094140	3.590333
10	Gazebo 3	99.094085	3.590252
11	Interpretation Board	99.093870	3.590469
12	Prayer Room (Musollah)	99.093769	3.590508
13	Entrance Gate Bridge	99.093475	3.590606
14	Toilet	99.093475	3.590606
No.	Description	Longitude	Latitude

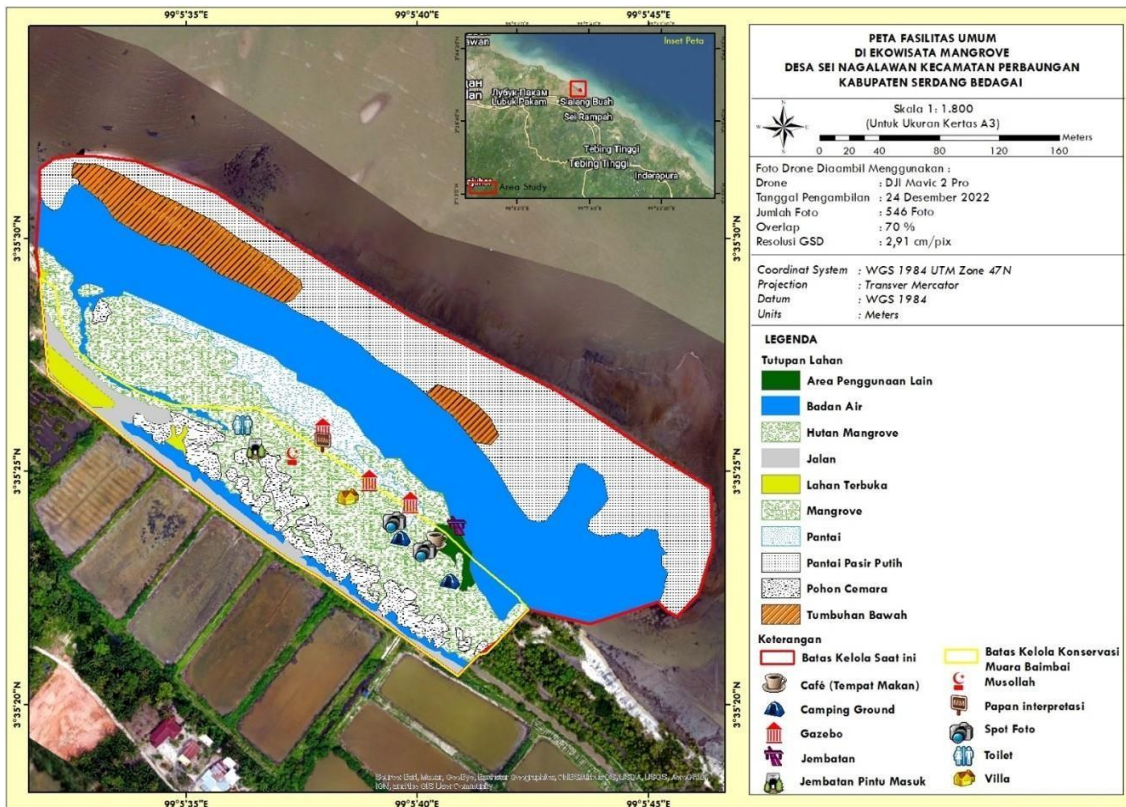


Fig. 3. Illustrates the land use distribution and tourism facilities in the Sei Nagalawan Mangrove Coast area, captured utilizing the DJI Mavic 2 Pro drone

Water bodies, both the sea and river estuaries, add an additional attraction for visitors who want to enjoy water tourism. Activities such as boat rides, swimming, and exploring raised land can be enjoyed by visitors. Additionally, various other attractions such as a variety of seafood cuisines, café shops, photo spots, aesthetically designed

gazebos, and glamping (triangular-shaped accommodation) are also available. For visitors who enjoy land adventures, there is also an ATV riding attraction to explore the beach via land routes. All these attractions make Sei Nagalawan Mangrove Beach a complete and enjoyable tourist destination.

Table 3. Land use in the Sei Nagalawan Mangrove Beach Area

No.	Land Use Type	Area (Ha)	Luas (%)
1	Other Use Area	0.06	0.77
2	Water Body	2.51	32.02
3	Mangrove Forest	1.69	21.56
4	Road	0.28	3.57
5	Open Land	0.09	1.15
6	Mangrove	0.09	1.15
7	Beach	0.34	4.34
8	White Sand Beach	1.85	23.60
9	Pine Trees	0.44	5.61
10	Undergrowth Plants	0.49	6.25
Total		7.83	100

3.2 Supporting Factors and Constrains in Empowerment for Creative Economy Development

The primary informant, Sutrisno, Chairman of the Muara Baimbai Mangrove Conservation Group, explained that the desire to build mangrove ecotourism arose from the awareness of the close connection between fishermen and mangroves. Through voluntary initiatives, they successfully formed a conservation group that plays a role in the preservation and development of ecotourism.

Empowering the community through mangrove ecotourism has a positive economic impact. Managing the area with a Community Forest Permit (HKM) scheme received support from the government and universities. Income comes from fees, food sales, souvenirs, and processed mangrove products. These profits not only benefit the managers but also empower the surrounding community.

However, there are challenges in empowerment. Community awareness regarding mangrove conservation is still minimal, reflected in the continued use of plastic waste. Lack of promotion and collaboration with tourism stakeholders is also a barrier, limiting the community's knowledge of the existence of this area.

By addressing these challenges, the Nipah Village Mangrove Ecotourism Area has the potential to continue growing as an ecotourism destination that not only empowers the managers but also enhances the quality of life for the local community.

As the village chief in Sei Nagalawan, the second informant explained his responsibility in supporting community empowerment through

mangrove ecotourism. The community institutionalization process began in the 1990s and received broad support from various parties, including local government and the Ministry of Environment. The Decree granting mangrove management rights became the basis for collaboration with universities and NGOs, allowing the community to receive various forms of assistance in the form of funds, training, and supporting facilities.

The village chief actively coordinates with the mangrove community, facilitating proposals for basic infrastructure such as water channels and roads, which are then accommodated by relevant parties. Support from the Village Government to the District Government, Provincial Government, and State-Owned Enterprises has helped develop and strengthen the community, positively impacting the people in Sei Nagalawan Village.

Regarding economic potential and creative economy development, the community in Sei Nagalawan Village engages in various creative economic activities, including culinary arts, fashion, crafts, and photography. Visitors, like the third informant, assess that this area has great potential. However, he also provides input regarding the importance of maintaining cleanliness and comfort for visitors. The presence of a museum and performances about mangroves is suggested for improvement but should be accommodated without sacrificing affordable entrance fees.

3.2.1 Supporting Factors

1. **High Tourist Interest:** The high interest of tourists in mangrove tourism activities provides significant opportunities for community empowerment. The uniqueness

of processed mangrove products and ecotourism attractions is a supporting factor.

2. **Flagship Mangrove Products:** Processed mangrove products such as screw pine tea, mangrove syrup, and screw pine crackers have the potential to become flagship products. Community empowerment can be enhanced through promotion and product development.
3. **Mangrove Conservation:** Awareness of the importance of mangrove conservation provides a strong foundation for community empowerment. The Mangrove Conservation Group of Muara Baimbai has contributed to mangrove forest preservation.
4. **Social Media and Internet:** The use of social media and the internet is an effective means of promoting mangrove ecotourism. Online marketing measures can increase reach and appeal to visitors.

3.2.2 Constraining Factors

1. **Limited Marketing:** The marketing of processed mangrove products is limited to the ecotourism gallery, preventing it from reaching a wider audience. This constraint is exacerbated by the limited use of modern technology through social media.
2. **Suboptimal Infrastructure:** Infrastructure facilities in mangrove ecotourism, including damaged bridges and a lack of attractive icons, serve as obstacles. This constraint also includes difficult access for visitors with large vehicles.
3. **Lack of Experts:** Weaknesses in human resources in shrimp farming hinder empowerment. A shortage of experts can impede the success of the vanamei shrimp cultivation program.
4. **Minimal Shrimp Farming Equipment:** Limited shrimp farming equipment, such as insufficient windmills and water pumps, can lead to production failures. Minimal equipment affects the efficiency of vanamei shrimp cultivation.
5. **Low Community Understanding:** Low understanding of the community and visitors about mangrove resources and ecosystems, as well as a lack of support from the village government and sufficient information, are inhibiting factors in empowerment.
6. **Environmental Threats:** High tourism activities can lead to increased waste,

waste disposal, and potential damage to the mangrove ecosystem. Conflicts of interest in ecotourism management also pose a serious threat.

One aspect that becomes the focus of empowerment is the economic welfare of the community. By introducing and educating the community about the importance of mangrove conservation, the Muara Baimbai Mangrove Conservation Group has successfully formed an actively engaged community group in the utilization of natural resources, especially mangrove forests. In this empowerment process, the group has adhered to principles such as self-leadership, active participation, self-reliance, family unity, self-discovery learning, and independence.

The Muara Baimbai Mangrove Conservation Group plays a role as an institution that helps strengthen community empowerment. The business unit programs they have formed not only provide education and knowledge but also facilitate the Sei Nagalawan Village community to become self-reliant. Thus, it is expected that the community can improve their standard of living without relying on third parties.

The research findings by Muhammad Buhari Sibuea [10] and Elfia Nurjana [11] support the empowerment concept in Sei Nagalawan Village. Village development activities and the utilization of mangrove forests are carried out through counseling, mentoring, and training. The Sei Nagalawan Village community is involved in mangrove forest management through a conservation, rehabilitation, and responsibility approach, in line with planning, implementation, and evaluation stages. All these efforts create an environment where the community actively participates in the development and preservation of natural resources.

3.2.3 Empowerment Strategies

1. **Enhance Mangrove Ecosystem Management:** Focus on ecotourism activities to improve mangrove ecosystem management.
2. **Sustain Tourism Object Continuity:** Ensure the sustainability of the mangrove tourism object by considering the area's carrying capacity.
3. **Promotion Through Social Media:** Intensify promotion through the internet and social media to attract tourist interest and expand information reach.

4. Development and Promotion of Processed Products: Develop mangrove processed products with attractive packaging and promote them through social media.
5. Environmental Education: Provide environmental education to tourists to maintain cleanliness and environmental awareness.
6. Additional Training: Provide additional training to community management groups to enhance their capacity in providing environmental education to tourists.

3.3 SWOT Analysis

SWOT Analysis is used to identify the strengths, weaknesses, opportunities, and threats for a specific project or business. The practice of SWOT Analysis is useful as a strategic planning tool and to stay attuned to ongoing trends. In simple terms, SWOT Analysis aids in team improvement and competitive opportunity exploration, both for professional and personal objectives. The definitions related to the components of SWOT Analysis are outlined below:

3.4 Strategies

1. SO Strategy (Strengths-Opportunities):

- Optimize forest utilization permits and administration to expand the reach of ecotourism activities.
- Enhance collaboration with various parties to support creative economic development.

2. WO Strategy (Weaknesses-Opportunities):

- Focus on improving technological competence and the use of social media through training and mentoring.
- Build broader partnerships to enhance the promotion and marketing of mangrove processed products.

3. ST Strategy (Strengths-Threats):

- Implement innovations in ecotourism area management to address rapid policy changes.
- Build flexibility and adaptability in the organizational structure to overcome leadership changes.

4. WT Strategy (Weaknesses-Threats)

- Focus on training and capacity building to address weaknesses in facing policy changes.

- Form readiness and planning strategies to manage the impact of threats to creative economic development.

By implementing these strategies, it is expected that community empowerment in the Sei Nagawalan Village mangrove ecotourism area can be effective and sustainable in facing environmental dynamics and utilizing creative economic opportunities.

3.5 Interview Data Analysis

Based on the interview results, the interviewee is deeply fascinated by mangrove ecotourism due to the significant role played by mangrove forests in coastal areas. The unique root system of mangroves, particularly in intertidal zones, contributes to their appeal.

"At first, what made me interested in researching this mangrove forest is because mangroves play a crucial role in coastal areas. With their well-adapted root system in intertidal areas, mangroves can prevent coastal erosion and are excellent for tsunami disaster mitigation, reducing the risk of losses and casualties. Additionally, mangrove forests can protect communities from seawater destruction."

As a researcher, the interviewee believes that mangrove forests can purify and clarify water, making them a plant worthy of preservation.

"As a researcher, I believe mangrove forests need to be preserved because their existence helps maintain the health and clarity of seawater. The roots can trap mud, which is highly beneficial for the environment. Moreover, mangrove forests are utilized by various groups as a source of oxygen due to their significant carbon dioxide absorption and storage capacity. In addressing climate change mitigation, mangroves are crucial, given the current global warming scenario. The oxygen released by mangrove forests is vital for maintaining the balance of the Earth's ecosystem."

The benefits of mangrove forests for environmental balance extend beyond water purification, carbon absorption, and oxygen release. According to the interviewee, they can also prevent storm winds in coastal mangrove areas, reducing environmental damage caused by storms.

Chart 1. SWOT analysis matrix for empowering the community in the Mangrove Ecotourism Area in Sei Nagawalan Village, Serdang Bedagai Regency

	Strengths	Weaknesses
Mangrove Ecotourism Area	Managed by a legally registered group with a long history	Lack of efforts to improve production equipment for products and competence in promotion and marketing
Managerial Competence	High level of managerial competence	Minimal competence in technology and the utilization of social media, especially among key stakeholders (Sei Nagalawan Village community)
	opportunities	Threats
Permit and Administrative Utilization	Opportunity in forest utilization permits and administrative completeness	Rapid policy changes and turnover in forest management leadership that can disrupt creative economic development
Broad Creative Economic Development Support	Opportunity for collaboration with various parties to support creative development	Need for strategies to face policy economic changes and leadership changes that may disrupt creative economic growth

"Mangrove forests have many benefits, not only for the surrounding ecosystem but also as a preventive measure against storm winds. In the case of a storm, the damage would be less severe if mangroves were present. In North Sumatra, the mangrove forest is relatively thick and good, but there is still damage due to conversion for other purposes, such as ponds, plantations, and more. However, many communities are currently involved in independent mangrove rehabilitation, supported by various parties."

enhance their income through mangrove tourism, but also by fishermen who have regained their livelihoods due to the return of marine life along the coast.

"Fishermen can now enjoy crabs, shrimp, and marine life that were once lost. I urge the community, especially those in coastal areas, and environmentally conscious students to participate in mangrove conservation efforts to the best of their ability."

As a researcher, the interviewee hopes that mangrove forests on the coast of North Sumatra will become increasingly sustainable over time, benefiting the coastal communities, as evident in Nipah Village, Sei Nagalawan.

The following are the conclusions that can be drawn:

1. The Vital Role of Mangrove Forests

- The expert confirmed that mangrove forests play a crucial role in maintaining the health of seawater, preventing coastal erosion, and providing protection against tsunami disasters.
- Mangrove forests are considered a significant source of oxygen due to their ability to absorb carbon dioxide and store carbon, positively impacting climate change mitigation.

2. Benefits of Mangrove Ecotourism

- The expert emphasized that mangrove ecotourism not only provides economic

"We hope that mangrove forests on the coast of North Sumatra can sustainably thrive, so coastal communities can reap the benefits. An example of this can be seen in the mangrove forest in Nipah Village, Sei Nagalawan. It began as a degraded land, underwent rehabilitation, and now not only showcases the greenery of mangroves but also provides additional income for the community, leading to an improvement in the well-being of the residents."

The impact of mangrove preservation is not only felt by the surrounding communities, who can

benefits through increased tourist visits but also has a positive impact on the environment and ecosystems.

- The function of mangrove ecotourism is also seen as an educational tool for the community and visitors regarding the importance of mangrove forest conservation.

3. Threats and Damage

- There is an agreement that there is damage to mangrove forests due to land conversion for other purposes, such as ponds and plantations.
- Unsustainable mangrove management can lead to the loss of mangrove forest functions and harm coastal ecosystems.

4. Preservation and Rehabilitation Efforts

- The expert provided a positive perspective on mangrove rehabilitation efforts, as seen in Kampung Nipah Sei Nagalawan.
- Support from the community and various stakeholders can assist in mangrove preservation, providing economic benefits and improving welfare.

5. The Importance of Community Awareness and Participation

- The expert emphasized the importance of community awareness and participation in preserving and conserving mangrove forests.
- Community awareness of the environmental and economic benefits of mangrove conservation is considered key to achieving sustainability.

This conclusion strengthens the validity of the research findings regarding the crucial role and benefits of mangrove ecotourism and the urgency of preserving mangrove forests as valuable environmental and economic assets.

4. CONCLUSION

It is found that the ecotourism area in Sei Nagalawan Village, Serdang Bedagai Regency, has significant potential supporting the development of the creative economy. Attractions such as mangrove forested beaches, unique natural products, and the phenomenon of shifting sandbanks are the main draws. The

Muara Baimbai Mangrove Conservation Group, with a business license in the form of a Community Forest Management Permit, plays a vital role in community empowerment through the creative economy. However, challenges are identified, such as insufficient government support, underutilization of technology, and product marketing challenges.

For managers and the Muara Baimbai Mangrove Conservation Group, it is recommended to focus not only on economic aspects but also on environmental impacts and holistic community empowerment. Local governments are expected to ensure the continuity of the Sei Nagalawan Village ecotourism development program, while future research is encouraged to focus more on the impact of ecotourism on the local community and environment.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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