

Implementation of Local Wisdom-Based Mangrove Forest Management Policy in Ruar Village, East Biak District

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Abstract

This study aims to determine local wisdom-based mangrove forest management in Ruar Village, East Biak District. The research used is a descriptive qualitative approach, utilizing the theories of Van Meter and Van Horn. Data collection methods used were interviews, observation, and literature review. The data analysis techniques used were data collection, data reduction, data presentation, and conclusion drawing. Research shows that mangrove forest management in Kampung Ruar remains informal and based on local wisdom, requiring the development of formal standards and regulations. Key challenges include human, financial, and time resources, as well as institutional weaknesses and territorial rights. The implementing organization is unstructured and dependent on indigenous communities, necessitating capacity building. Implementers must be serious and conservation-oriented, with communication skills needing to be enhanced through collaborative coordination. Social, economic, and political conditions significantly influence management success.

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1. INTRODUCTION

Indonesia is an archipelagic nation comprising approximately 17,504 islands with a coastline stretching approximately 81,000 km. Despite its relatively narrow coastal area, this region is rich in natural resources, both living and non-living, and provides environmental services that play a vital role in the lives of its people.(Mastika, 2018). This potential can be utilized sustainably, so it must be managed in an integrated manner.(Cece Sobarna, Taufik Ampera, 2021). The high biological productivity and diverse natural resource potential of Indonesia's regions require optimal development because they play an important role in social, economic, cultural, environmental growth and support sovereignty.(Rantetandung et al., 2024). The surrounding community must be involved in the management stage to optimize the benefits of the Mangrove Forest.(Sentanu et al., 2021)This is related to local wisdom in its management in a region, meaning that the community participates in carrying out an action.(Wibowo & Belia, 2023).

Policies related to Mangrove Forest Management formulated by the central government are interrelated. Based on Law Number 32 of 2009 concerning Environmental Protection and Management, this regulation serves as an important basis for maintaining and managing environmental sustainability in an integrated manner. Sustainable Mangrove Ecosystem Management includes all efforts to protect, express, and utilize Mangrove Ecosystems sustainably by using integrated processes to achieve sustainability. The functions of Mangrove Ecosystems for community welfare(Irmayanti et al., 2024).

Based on the Decree of the President of the Republic of Indonesia Number 73 of 2012, Article 1, paragraph 1 concerning the National Strategy for Mangrove Ecosystem Management, it is stated that an effort is needed to formulate policies and programs for sustainable Mangrove Ecosystem Management by utilizing available resources to support national development planning.

Furthermore, Presidential Regulation No. 120 of 2020 concerning Mangrove Ecosystem Institutions regulates the governance and management of institutions responsible for the preservation, protection, and sustainable use of mangrove ecosystems. This regulation aims to strengthen coordination between relevant institutions and ensure effective and efficient mangrove management for ecosystem sustainability and socio-economic benefits for the community.

To maintain their sustainability, mangrove forests require optimal management due to their diverse benefits. Policies regarding mangrove forest management are outlined in Minister of Environment and Forestry Regulation Number 9 of 2021 concerning Social Forestry Management. Furthermore, Law Number 27 of 2007, which was later revised as Law Number 1 of 2014 concerning the Management of Coastal Areas and Small Islands, also regulates this.

Indonesia has mangrove forests that cover 20-25% of the world's mangrove ecosystem. According to the Ministry of Environment and Forestry (KLHK), the total mangrove area in Indonesia is 3.36 million hectares, spread across:

- (1) Papua covers an area of 1,562,905 hectares,
- (2) Sumatra covers an area of 660,445 hectares,
- (3) Kalimantan covers an area of 688,025 hectares,
- (4) Java covers an area of 224.46 hectares, and
- (5) Bali-Nusa Tenggara covering an area of 39,974 hectares.

Biak Numfor Regency is one of the regencies in Papua, which consists of Biak and Numfor Islands, along with several other islands. Biak Numfor Regency is the capital of Biak City. The regency consists of 19 districts, with 17 located in coastal areas: 12 on Biak Island, 5 on Numfor Island, and two on the Aimando and Padaido Islands, each with four small coral islands. East Biak District covers an area of 217.68 km² and consists of 17 villages, including Ruar Village.

Local wisdom is the knowledge of local or regional wealth in the form of knowledge, beliefs, norms, customs, culture, insights, and others that are inherited and maintained as an identity and guideline that teaches us to act appropriately in life. (Wahid, 2023). Local wisdom as a view of life, knowledge, and various life strategies that originate from community actions (Suriyankietkaew et al., 2025).

To this day, the Biak Numfor community maintains local wisdom that remains a part of their lives. One such tradition is "Kankain Karkara Byak," an annual community assembly that discusses customary issues such as land, marriage, and dowry. Kankain Karkara Byak also embodies values such as deliberation, unity, responsibility, and mutual cooperation, which the community has practiced for a long time. This local wisdom remains alive and can help preserve cultural identity, including in mangrove forest management. Ruar Village possesses local wisdom inherited from its ancestors, including customary land that has been managed from generation to generation, as well as various local wisdoms that serve as guidelines for the community's life in maintaining harmony with nature and culture.

According to a 2023 report by Jubi TV, the mangrove forest is managed by indigenous communities. By managing the mangrove forest, it is hoped that indigenous communities will receive a salary to meet their family needs. A special empowerment program for indigenous Papuans involves indigenous communities in managing various

natural tourist attractions. The Biak Numfor Regency government, through the Tourism Office, continues to empower local communities to generate income.

The 25-hectare mangrove forest area is located in Biak Numfor Regency, Papua Province, specifically in Ruar Village, East Biak District. It consists of 4 hectares of land and is 200 meters long from the main road to the beach. It remains part of local wisdom. The local wisdom referred to in this study refers to the local community as the manager of the Ruar Village Mangrove Forest. This is due to land rights, where some groups legally own mangrove land. This situation limits access for the general public residing in Kampung Ruar, who lack land rights, and therefore do not receive equitable benefits and advantages from mangrove forest management.

Based on the results of initial observations, researchers found a problem that the construction of the bridge built in 2023 to 2024 by the Tourism Office, the PUPR Office, and the Environmental Office brought very significant changes to Kampung Ruar, especially the Mangrove Forest. After being built by the relevant agencies, the area was donated back to the local community who had rights to the land to improve the economy of the local indigenous community. The local indigenous community also utilizes the abraded Mangrove trunks to make lime which is then sold in the market, this activity contributes to improving the local economy.

2. METHOD

This study employed a descriptive qualitative approach, employing the theories of Van Meter and Van Horn. Data collection utilized interviews, observation, and literature review. Data analysis techniques included data collection, data reduction, data presentation, and conclusion drawing.

3. RESULTS AND DISCUSSION

The research results and discussion of this research are presented as follows:

1. Policy standards and objectives

The standards and objectives of the Mangrove Forest Management Policy in Kampung Ruar are crucial for strengthening the foundation for sustainable Mangrove Forest Management through organized regulations that provide clarity on rights and obligations to protect the Mangrove Area from damage. Furthermore, these regulations should also open up opportunities for sustainable economic development while respecting local wisdom and meeting the needs of coastal communities.

2. Resource

Mangrove Forest Management in Kampung Ruar faces quite serious obstacles, particularly in terms of the availability and utilization of these three resource aspects.

a) Human resources are a key element in the successful implementation of a policy, as humans possess the power of thought and analytical skills. The role of human resources is crucial, given that they are the ones who implement and direct the policy. Without human implementers, formulated policies cannot be effectively implemented. The capacity of human resources in Kampung Ruar still needs to be strengthened through ongoing training on mangrove management, conservation, and environmental management. As the primary actors in management, local communities must be provided with adequate knowledge and skills to enable them to carry out activities independently and professionally. This capacity building is crucial to ensuring the sustainability of the mangrove ecosystem and improving community well-being.

b) Financial resources relate to the budget required to implement the designed policy programs. Mangrove management in Kampung Ruar requires efficient and optimal

fund management. Currently, available funds are limited and need to be appropriately directed, including seeking alternative funding sources such as village funds, grants, and partnerships with the private sector and NGOs. Fund management must be transparent and well-documented to support training, maintenance, and sustainable institutional development.

c) Time resources refer to the scheduling of pre-designed policy activities, with the aim of ensuring that the implementation process proceeds according to the established plan. Mangrove management requires sufficient time for implementation, evaluation, and continuous improvement. Community and institutional participation must be scheduled regularly and continuously to ensure management activities continue uninterrupted and are able to adapt to changing environmental and social conditions. Time allocation must be balanced with efforts to ensure efficiency and consistency in carrying out all activities.

3. Characteristics of Organization

The characteristics and organizational structure of mangrove forest management actors in Kampung Ruar are informal and lack definitive formal institutions. Area management relies heavily on customary institutions and local communities, which play a key role in decision-making and implementation of management activities. However, these institutions still need support and strengthening to carry out their management functions more effectively and in an organized manner. Furthermore, mangrove area management in Kampung Ruar still faces challenges related to unclear land rights and a lack of institutional understanding among the community. This situation has the potential to hinder sustainable management due to the uncertainty of rights and strong institutional structures.

Therefore, developing formal institutions is essential to provide a clear legal basis and structure for mangrove area management. Building community capacity through training, education, and institutional knowledge is a strategic step to empower them to manage mangroves independently and sustainably. This will further ensure the sustainability of mangrove management in Kampung Ruar, support ecosystem preservation, and improve community well-being.

4. Implementer's attitude

The actions of the implementers in Kampung Ruar demonstrate a strong, firm, and focused commitment to the sustainable conservation of the mangrove ecosystem. They recognize that maintaining the sustainability of mangrove areas is not only crucial for environmental sustainability but also for supporting the well-being of the local community. With a disciplined and responsible approach, the implementers strive to manage the mangroves effectively to ensure their continued benefits, including for the community's economy and the preservation of local culture.

Furthermore, this stance reflects support for national and international efforts to address climate change, given the crucial role of mangroves as carbon sinks and protection against natural disasters. Strict and serious implementation in Kampung Ruar aims to ensure that mangrove management is not solely oriented towards short-term economic gain, but also towards ecosystem sustainability and improving community well-being in the long term.

5. Organizational communication

Currently, organizational communications in Kampung Ruar have not provided an official response to previous meetings, including discussions on the use of village funds and the Mangrove Forest Management Plan. Although various parties, including the provincial government, local governments, and universities, have

conducted various activities and developed technical plans, these results have not been communicated or coordinated with the local government to become official policy.

The policy-making process itself requires clear steps in the form of a draft, followed by public consultation, and then a decision is made based on the results. To date, there have been no formal government meetings because the relevant policies have not yet been formulated. The public is actually very receptive to encouragement and opportunities to participate, as they recognize that the policies will have a positive impact on them.

6. Socio-economic and political conditions

Social, economic, and political factors can influence the level of effectiveness of the expected policy implementation. Based on the findings from observations and direct interviews at the location, the author concludes that, The social, economic and political conditions in Kampung Ruar have a major influence on the implementation of a policy.

a) Social conditions

The arrival of visitors to Kampung Ruar provides an opportunity for the community to interact with new people, which has a significant impact on their social life. Local traditions and culture are closely linked to mangrove management, such as the use of the PDAM water source, which is traditionally used as a substitute for flour, as well as as a source of food and to make local cakes.

b) Economic conditions

Mangrove management has a significant economic impact. Communities gain employment, income, and food from these mangrove areas. The management and economic benefits of mangroves are considered balanced, at approximately 50%. Research and local management findings indicate that mangroves play a vital role in supporting the community's economic needs.

c) Political Conditions

Political policies have a significant impact. If a policy changes the function of mangroves for cultivation or other economic activities, it can immediately alter the role of the area. Sudden policy changes can have a significant impact on the management and livelihoods of communities surrounding the mangroves.

4. CONCLUSION

Based on research, the implementation of the Local Wisdom-based Mangrove Forest Management Policy in Kampung Ruar faces major challenges, including the informal nature of the policy and organization, the need for institutional strengthening, and limited human, financial, and time resources. Implementers must be serious and conservation-oriented, while communication and coordination between stakeholders need to be improved. Social, economic, and political factors also influence management success. Suggestions from researchers include improving the legality of policies through harmonization with formal regulations, training in mangrove management, seeking alternative funding sources, creating clear SOPs, and strengthening communication systems between stakeholders to support sustainable management.

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6. BIBLIOGRAPHY

Cece Sobarna, Taufik Ampera, ASA (2021). Local Wisdom-Based Ecotourism Development in Cilangcang Village, Cikijing District, Majalengka. Dharmakarya:

- Journal of Science and Technology Applications for the Community, 10(3), 267.
<https://doi.org/10.24198/dharmakarya.v10i3.31068>.
- Irmayanti, D., Ekomurtiningsih, BS, & Berto, AR (2024). Collaborative Strategies for Managing Mangrove Ecotourism: Raising Awareness and Stakeholder Participation in Sustainable Tourism. Lontar: Journal of Communication Science, 12(2), 322–333.
<https://doi.org/10.30656/lontar.v12.i2.8744>.
- Mastika, IK (2018). Developing Ecotourism Based on Local Wisdom in the Former Besuki Residency Area, East Java. Jurnal Master Pariwisata, 4(2), 240–252.
<https://doi.org/10.24843/JUMPA.2018.v04.i02.p06>.
- Rantetandung, D., Aksa, K., & Taking, MI (2024). Strategies of Development of Ecotourism Mangrove Pomako in Mimika Regency. Journal of Urban Planning Studies, 4(1), 19–26.
- Cece Sobarna, Taufik Ampera, ASA (2021). Local Wisdom-Based Ecotourism Development in Cilancang Village, Cikijing District, Majalengka. Dharmakarya: Journal of Science and Technology Applications for the Community, 10(3), 267.
<https://doi.org/10.24198/dharmakarya.v10i3.31068>.
- Irmayanti, D., Ekomurtiningsih, BS, & Berto, AR (2024). Collaborative Strategies for Managing Mangrove Ecotourism: Raising Awareness and Stakeholder Participation in Sustainable Tourism. Lontar: Journal of Communication Science, 12(2), 322–333.
<https://doi.org/10.30656/lontar.v12.i2.8744>.
- Mastika, IK (2018). Developing Ecotourism Based on Local Wisdom in the Former Besuki Residency Area, East Java. Jurnal Master Pariwisata, 4(2), 240–252.
<https://doi.org/10.24843/JUMPA.2018.v04.i02.p06>
- Rantetandung, D., Aksa, K., & Taking, MI (2024). Strategies of Development of Ecotourism Mangrove Pomako in Mimika Regency. Journal of Urban Planning Studies, 4(1), 19–26.
- Sentanu, IGEPS, Prabowo, A., Kumalasari, K., Galih, AP, & Wismanu, RE (2021). Stakeholder Collaboration Model for Ecotourism Development in Indonesia: Case Study from Batu City, East Java Province. Journal of Government and Civil Society, 5(2), 214. <https://doi.org/10.31000/jgcs.v5i2.4420>.
- Suriyankietkaew, S., Krittayarungroj, K., Thinthan, S., & Lumlongrut, S. (2025). Environmental and Sustainability Indicators Creative tourism as a driver for sustainable development: A model for advancing SDGs through community-based tourism and environmental stewardship. Environmental and Sustainability Indicators, 27(7), 1–14.
- Wahid, B. (2023). Kokoda People: Mobilization, Marginalization and Their Economic Lives in Sorong, Southwest Papua. Cosmopolitan Civil Societies, 15(2), 19–32.
<https://doi.org/10.5130/ccs.v15.i2.8211>.
- Wibowo, MS, & Belia, LA (2023). Community Participation in Sustainable Tourism Development. Journal of Hospitality and Tourism Management, 6(1), 25–32.