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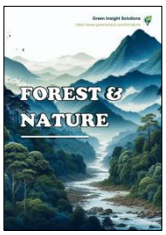


RESEARCH ARTICLE

# Integrating Conservation and Ecotourism within Community-Based Mangrove Management: Empirical Evidence from Sawinggrai, Raja Ampat

**Novelina Tampubolon*, Novelin Saranga, Yuanike Kaber, Yusril Munawir**

Department of Ecotourism, Faculty of Fisheries and Marine Sciences, University of Papua, Southwest Papua, Indonesia
* Corresponding author. E-mail address: novelinatampubolon@gmail.com

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**ABSTRACT**

Mangrove ecosystems play a crucial role in maintaining coastal stability while supporting local welfare through environmental services and sustainable economic opportunities. In archipelagic regions such as Raja Ampat, integrating mangrove conservation with community-based ecotourism is a strategic necessity; however, this approach often faces complex institutional and governance challenges. A significant research gap remains in understanding how the nuanced interactions among subsystems within the social–ecological system (SES)—specifically the interplay between resource units, governance systems, and actors—determine long-term sustainability. This study addresses this gap by assessing the biophysical status of mangroves and community dynamics in Sawinggrai Village to develop an integrated, community-based management model. Using a qualitative explanatory case study with a participatory approach, data were collected from 50 stakeholders through in-depth interviews, focus group discussions, and field observations. Data were analyzed using an interactive qualitative framework, strengthened by an SES perspective to capture the feedback loops between social and ecological components. The findings reveal that although mangrove ecosystems remain in relatively good biophysical condition with low to moderate anthropogenic pressure, the system's stability is precarious. Strong customary institutions and high community awareness coexist with limited formal regulatory structures and unequal access to ecotourism benefits. A key contribution of this study lies in demonstrating that inequitable benefit-sharing functions as a critical mediating variable that weakens collective action and, consequently, ecological sustainability. To address this, the study proposes an integrative management model that aligns ecosystem protection, institutional strengthening, and equitable benefit-sharing within a dynamic SES framework. This model advances both theory and practice by offering a scalable approach for reconciling livelihood needs with conservation objectives.

## 1. Introduction

Mangrove ecosystems are among coastal ecosystems that play important ecological, economic, and social roles in supporting coastal sustainability. Mangroves act as natural protectors of the coast from abrasion and sea waves, habitats for various aquatic biota, absorbers and reservoirs of blue carbon, and sources of livelihood for coastal communities (Alongi, 2021; Friess et al., 2022). However, mangrove ecosystems continue to face pressure from land conversion, unsustainable resource exploitation, and weak governance that does not fully involve local communities (FAO, 2022).

Raja Ampat, situated at the heart of the coral triangle, is widely recognized as a global marine biodiversity hotspot and has emerged as a leading ecotourism destination in Indonesia, where coastal ecosystems such as coral reefs, seagrass beds, and mangroves play a critical role in supporting biodiversity conservation and local livelihoods (Friess et al., 2022; UNESCO, 2023; Gustiarini et al.,

2023). A study on the application of ecotourism concepts in the tourist village of Arborek, Raja Ampat District, shows that the application of ecotourism principles that account for conservation values and involve local communities contributes to the sustainability of the social and economic functions of coastal areas (Tampubolon et al., 2021). In addition to coral reefs and seagrass ecosystems, mangrove ecosystems and their supporting environmental services are present in this region. Sawinggrai Village is one of the coastal villages in the Raja Ampat Regency with a relatively well-preserved mangrove area. It is beginning to be utilized as part of nature-based and local culture-based ecotourism activities. The existence of mangroves in Sawinggrai Village is not only ecologically valuable but also economically valuable through the development of ecotourism, such as mangrove educational tours, coastal water exploration, and tourism attractions based on the community's local wisdom.

In the context of natural resource management, the community-based natural resource management approach is increasingly recognized as an effective strategy for maintaining ecosystem sustainability, improving the implementation and monitoring of resource management, and integrating local knowledge, cultural values, and conservation principles (Berkes, 2021). In coastal areas such as Raja Ampat, where indigenous communities have strong social and cultural ties to coastal resources, community-based mangrove management is a relevant and contextual approach. However, the integration of mangrove development still faces various challenges. These challenges include limited local institutional capacity, suboptimal economic benefit-sharing mechanisms, and potential conflicts between conservation interests and the intensity of tourism use (Stone et al., 2020). Without clear and adaptive management arrangements, these pressures may gradually undermine the ecological resilience of mangrove ecosystems and weaken community support for conservation. In this context, an important research gap remains: the absence of a community-based mangrove management model that explicitly integrates ecosystem conservation with sustainable ecotourism development, particularly at the village level in archipelagic areas such as Raja Ampat. Most previous studies tend to treat mangrove conservation and ecotourism as separate objectives. For example, many recent works still prioritize biophysical restoration and carbon sequestration as isolated ecological goals (Friess et al., 2022), while tourism-focused research often emphasizes economic recovery and destination branding without fully integrating ecological thresholds (Spalding and Parrett, 2019). This conceptual separation often results in management frameworks that overlook the complex social–ecological interdependencies. Such a disconnect poses a significant threat to long-term sustainability: it may lead to social exclusion, reduced community compliance with environmental regulations, and a failure to maintain the feedback loops necessary for ecosystem resilience in the face of climate change.

In addition, empirical studies that highlight the roles, capacities, and institutional dynamics of local communities in mangrove management remain relatively limited, especially those that link them to the distribution of economic benefits from ecotourism and to simultaneous ecosystem protection efforts. This condition indicates the need for a research approach that is not only oriented towards the biophysical aspects of mangroves, but also pays attention to the social, institutional, and economic dimensions of coastal communities. Therefore, this article aims to examine and formulate a community-based mangrove management model for Sawinggrai Village, Raja Ampat, with an emphasis on integrating mangrove ecosystem conservation and sustainable ecotourism development. This study used a qualitative, participatory approach, collecting data from local communities, traditional leaders, tourism managers, and relevant stakeholders to understand current management practices, community perceptions, and the role of local institutions. The management model developed is expected to represent local socio-ecological conditions and serve as the basis for formulating adaptive, inclusive, and sustainable mangrove management strategies. Conceptually, this study advances the literature on coastal resource management by proposing an integrative management model based on the social–ecological system (SES) framework. Unlike conventional approaches that often prioritize ecological or economic goals in isolation, this model explicitly synchronizes biophysical resilience with social equity through a structured mechanism of benefit-sharing and institutional alignment. Methodologically, this research introduces a participatory SES perspective at the village level, providing a more detailed understanding of the feedback loops between customary practices, governance, and formal policy. In practice, these findings offer strategic policy implications for archipelagic regions, particularly for addressing the unique tensions of island-based ecotourism. The study serves as a critical reference for local governments and area managers in Raja Ampat and beyond, providing a scalable framework to

strengthen mangrove governance while ensuring the socio-economic empowerment of indigenous communities.

## 2. Materials and Methods

### *2.1. Research Location and Time*

This research was conducted in Sawinggrai Village, Raja Ampat Regency, West Papua Province, from September to December 2025. Sawinggrai was purposively selected as the study site for its ecologically significant mangrove cover and its established reputation as a community-led ecotourism hub. This setting provides a critical case for examining the functional integration of indigenous resource governance and sustainable economic use.

### *2.2. Research Approach and Design*

This study uses a qualitative explanatory case study design. This approach was selected to move beyond surface-level descriptions and examine the causal mechanisms and social dynamics that influence community-based mangrove management. A participatory strategy was incorporated to capture indigenous knowledge and the diverse perspectives of local actors, ensuring that the resulting management model is grounded in the region's socio-cultural reality.

### *2.3. Data Collection Techniques and Research Respondents*

Data collection was carried out using several techniques involving respondents and informants selected purposively, namely those considered knowledgeable about mangrove management and ecotourism activities in Sawinggrai Village. There were 50 respondents in this study, comprising various stakeholder groups (**Table 1**). In addition, the types of data collected in the study are detailed in **Table 2**.

**Table 1**. Respondent category number (persons)

| No. | Respondent category | Number (persons) |
|---|---|---|
| 1 | Traditional leaders and elders | 5 |
| 2 | Village officials and institutional managers | 5 |
| 3 | Tour guides | 5 |
| 4 | Homestay managers | 5 |
| 5 | Tourist attraction managers | 5 |
| 6 | Local government | 3 |
| 7 | NGOs/ partners in conservation and ecotourism development programs | 2 |
| 8 | Community | 20 |
| | **Total** | **50** |

#### *2.3.1. Biophysical observation methods*

To establish a technical baseline for the social–ecological system (SES) analysis, mangrove biophysical conditions were assessed using systematic transect lines and quadrat sampling (10 m × 10 m plots). Parameters measured included species composition, tree density (DBH > 10 cm), and regeneration status (saplings and seedlings). Field observations also focused on pressure indicators, such as evidence of manual logging, waste accumulation, and land-use conversion at the forest-settlement interface.

#### *2.3.2. Social, institutional, and economic data*

Primary data were collected through in-depth interviews and focus group discussions. These sessions focused on mapping customary rules, the distribution of ecotourism income, and perceptions of institutional transparency. Secondary data were obtained from documentation studies of village regulations and local management plans.

**Table 2**. Type of data, sources, and data collection techniques

| No. | Data type | Variables/ aspects studied | Source | Data collection techniques | Expected output |
|---|---|---|---|---|---|
| 1 | Mangrove biophysical data | General condition of mangroves, dominant species area, and zoning of utilization, potential pressure/ damage | Field observation, local community | Direct observation, interviews | Overview of the condition of mangrove ecosystems as a basis for conservation |
| 2 | Social data of the community | Level of community participation, perceptions of conservation and ecotourism, and local knowledge | Coastal communities, traditional leaders | In-depth interviews, focus group discussions | Information on the role and support of the community in management |
| 3 | Institutional data | Local institutional structures, customary and formal rules, and decision-making mechanisms | Village officials, traditional leaders. Local administrators | In-depth interviews, documentation studies | Mapping governance and the roles of management actors |
| 4 | Economic and ecotourism data | Types of mangrove ecotourism activities, sources of income, and distribution of economic benefits | Ecotourism operators, communities, managers | Interviews, observations | Information on the contribution of ecotourism to community welfare |
| 5 | Policy and supporting data | Regulations, programs, and plans for mangrove and ecotourism management | Local government, official documents | Documentation study | Supporting policy framework for mangrove management |

### *2.4. Data Validity and Credibility*

To ensure methodological rigor and the trustworthiness of the qualitative findings, two main procedures were implemented.

1. Triangulation: Source triangulation was conducted by cross-verifying data across different stakeholder groups, while methodological triangulation involved comparing interview narratives with direct field observations and official documents.
2. Member checking: Preliminary findings and the proposed management model were presented to key community informants in a follow-up session. This ensured that interpretations accurately reflected the local context and corrected any misconceptions regarding customary governance.

### *2.5. Data Analysis Techniques*

Data analysis in this study was conducted using a systematic qualitative-descriptive approach, accompanied by structured data organization to improve traceability and accuracy of analysis. The research focused on formulating a model and understanding the community-based mangrove management process, so the analytical framework used referred to the interactive analysis of Miles et al. (2022), which emphasized the systematic process of data reduction, data presentation, and conclusion drawing. This approach enables researchers to consistently identify patterns, trends, and interrelationships between social, institutional, and ecotourism utilization variables, so that the analysis results maintain an adequate level of accuracy and accountability for journals that demand methodological clarity.

In this study, community-based mangrove management was analyzed using the SES framework to comprehensively explain its dynamics and support the development of a contextual and applicable sustainable ecotourism management model. The SES framework used in this research refers to the latest developments in SES in the study of community-based natural resource management (Berkes, 2021; Folke et al., 2021). This framework views mangrove ecosystems as part of a system that is integrated with social actors, local institutions, and ecotourism economic dynamics. The SES approach allows for a more comprehensive analysis of the interactions, feedback, and resilience of the mangrove management system in Sawinggrai Village.

## 3. Results and Discussion

### *3.1. Biophysical Conditions of Mangrove Ecosystems*

Field observations indicate that the mangrove ecosystem in Sawinggrai Village remains in relatively good condition, as shown by continuous vegetation cover, low fragmentation, and clear natural zonation dominated by *Rhizophora apiculata* and *Sonneratia alba*. Stand density is estimated at around 1,500–2,500 trees/ha, with abundant seedlings and saplings indicating ongoing natural regeneration. The mangrove belt, which extends approximately 300–500 m, also contributes to coastal protection by reducing erosion and buffering wave energy (Friess et al., 2022; UNEP, 2023).

These characteristics indicate that the mangrove ecosystem remains relatively stable and continues to support important ecological functions. The substrate, dominated by organic-rich sandy mud, facilitates sediment accumulation, nutrient cycling, and shoreline stabilization. This assessment is based primarily on ecological observations, while community perceptions provide complementary evidence. In this regard, 82% of respondents stated that mangrove cover has not changed significantly over the past five years (**Fig. 1**), which is consistent with field observations. Together, these findings suggest that ecological conditions in the area remain well-maintained.

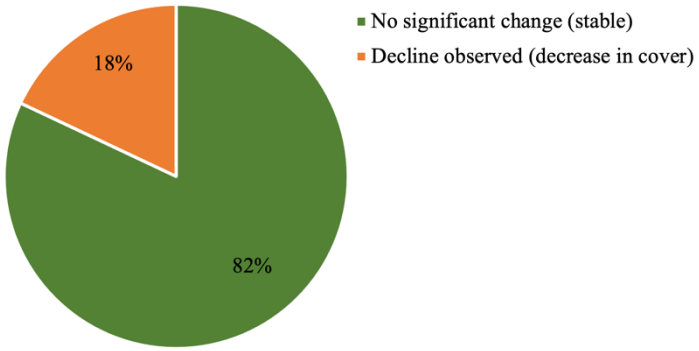


**Fig. 1**. Distribution of respondent perceptions regarding changes in mangrove cover in Sawinggrai Village over the past five years.

Current human pressure on the ecosystem remains relatively low to moderate. Some respondents reported limited timber use for household needs (18%), while others identified tourism activities (24%) as a potential source of pressure. However, these activities have not yet caused visible changes in vegetation structure or zonation. Even so, increasing tourism needs to be managed carefully, as repeated small-scale disturbances may gradually affect ecosystem functions (Alongi, 2021). Therefore, future management should aim to balance ecotourism development with the protection of mangrove structure and ecological processes, so that the ecosystem's environmental services are sustained over the long term (FAO, 2022).

### *3.2. Community Participation and Perceptions of Mangrove Conservation*

Results from interviews and focus group discussions indicate that the people of Sawinggrai Village generally hold positive views about the importance of mangroves. Approximately 90% of respondents considered mangroves important for coastal protection and maintaining water resources (**Fig. 2**), while 76% associated mangroves with ecotourism development and livelihood opportunities (Berkes, 2021;

Hill et al., 2020). These responses suggest a strong body of local ecological knowledge shaped by daily interaction with the coastal environment.

At the same time, perceptions differed across social groups. Traditional leaders and older residents tended to emphasize mangroves in terms of customary responsibility and environmental protection. In contrast, those more involved in tourism often saw mangroves as supporting local income and tourism opportunities. Younger respondents generally expressed positive attitudes, although their understanding was often shaped more by tourism and environmental awareness than by customary management practices. These differences indicate that perceptions are shaped by social position and lived experience, rather than reflecting a single shared view across the community.

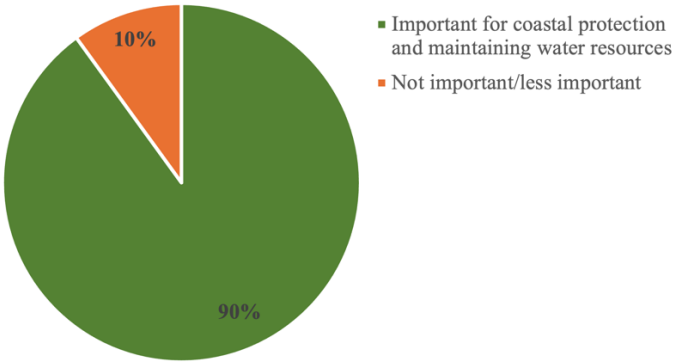


**Fig. 2**. Distribution of respondents based on their perception of the importance of mangrove for coastal protection and maintaining water resources in Sawinggrai Village.

Positive perceptions, however, do not necessarily lead directly to conservation action. Several respondents expressed support for protecting mangroves but were only marginally involved in management activities, often because opportunities to participate in decision-making were limited or because livelihood concerns took precedence over conservation commitments. This highlights an important distinction between support for conservation in principle and the capacity to act on it in practice. In this sense, behavior appears to be influenced not only by ecological awareness but also by institutional access, incentives, and everyday economic realities.

This pattern is also evident in participation. Although approximately 68% of respondents were involved in activities such as area protection, assisting tourists, or nature-based tourism, participation was mainly concentrated at the implementation level. Only 42% reported involvement in village discussions related to mangrove management and ecotourism. This imbalance suggests that while community participation exists, it is not yet equally reflected in decision-making processes. Such conditions may limit the sense of ownership over management rules and outcomes.

These findings indicate that strengthening conservation behavior is not simply a matter of raising awareness, but also of creating conditions that enable awareness to be translated into collective action. More inclusive village deliberation, stronger local institutions, and mechanisms that accommodate different social interests will be important for improving both governance and long-term socio-ecological resilience (Bennett et al., 2021; Reed et al., 2021).

### *3.3. Local Institutions and Governance Mechanisms*

Institutionally, mangrove management in Sawinggrai Village involves village authorities, customary leaders, tourism groups, and, to a lesser extent, support from local government and NGOs. Approximately 64% of respondents indicated that customary rules remain the main reference for regulating mangrove use (**Fig. 3**), while formal village regulations have not yet been systematically documented. This suggests that governance still relies largely on local norms and customary arrangements, which continue to play an important role in organizing resource use at the village level (Bennett et al., 2021; Erbaugh et al., 2024).

Interviews and focus group discussions also suggest that decision-making is often shaped by a relatively small number of actors, particularly customary leaders and individuals involved in village administration or tourism management. This does not necessarily indicate domination or elite control, but it does show that influence in governance is not distributed evenly. In practice, many decisions still

depend on respected senior figures or those more actively involved in village affairs, a pattern commonly found in community-based governance settings.

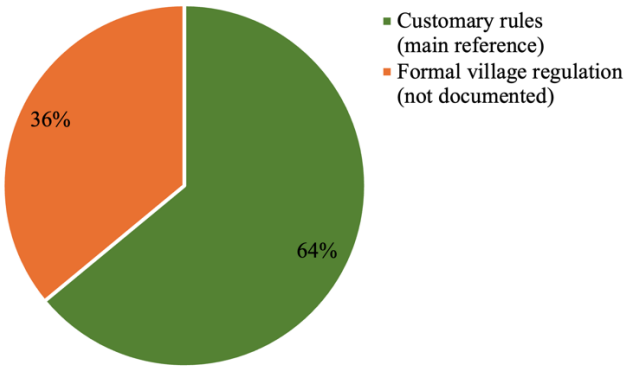


**Fig. 3**. Distribution of respondents based on the reference used for regulating mangrove use in Sawinggrai Village.

Access to deliberative processes also appears to vary among social groups. While village discussions are generally open, not all groups participate with the same intensity or influence. Women and younger community members, for example, are often involved in implementation activities, but their role in shaping decisions or management priorities is more limited. This does not suggest exclusion, but rather differences in voice and influence that affect how inclusive governance operates in practice. Recognizing these differences is important, as they shape both the legitimacy and effectiveness of management arrangements.

This issue is also evident in the institutional structure itself. Approximately 58% of respondents considered mangrove and ecotourism management arrangements to be relatively informal and often reliant on the initiative of specific individuals. While such leadership can be beneficial, especially for maintaining local coordination, dependence on a few key actors may also create vulnerabilities if responsibilities are not more widely shared. Similar concerns have been identified in other community-based management contexts, where continuity often depends as much on inclusive institutional processes as on strong leadership (Partelow et al., 2023; Stone et al., 2020).

These findings highlight the importance of strengthening local institutions not only through more formal village regulations but also by broadening participation and clarifying roles among different actors. Creating more opportunities for women, younger generations, and other underrepresented groups in village deliberations could help make governance more inclusive and adaptive. Thus, institutional strengthening involves not only formal structures, but also improving how decisions are made and shared within the community (Bennett et al., 2021; Folke et al., 2021). Viewed through the social–ecological system framework, these findings suggest that institutional effectiveness is shaped not only by the presence of customary rules but also by the distribution of authority, participation, and access among actors. Governance outcomes in Sawinggrai are therefore influenced not only by institutional arrangements but also by interactions among actors, rules, and benefit-sharing processes. This reinforces the argument that equity in participation and the distribution of benefits serves as an important mediating factor linking governance effectiveness to long-term social–ecological resilience.

### *3.4. Mangrove Ecotourism and Economic Benefit Distribution*

Ecotourism activities in Sawinggrai include mangrove educational tours, coastal water exploration, and integration with local cultural attractions. These activities represent an experiential and educational form of ecotourism that aims not only to generate income but also to strengthen conservation awareness. Approximately 46% of respondents reported receiving direct economic benefits, mainly as tour guides, homestay operators, or providers of supporting services. This indicates that mangrove ecotourism has contributed to livelihood diversification in the village, as also noted in studies of community-based ecotourism in coastal and small-island settings (Gurney et al., 2021; Spenceley et al., 2017).

At the same time, access to these benefits remains uneven. Approximately 54% of respondents reported not experiencing direct financial gains from tourism, despite supporting its development (**Fig.**

**4**). Interviews indicate that this disparity is shaped by several factors rather than by a single cause. In some cases, opportunities to participate in tourism-related activities are limited to households with stronger connections to tourism operations, access to visitors, or relevant skills and assets. In other cases, respondents noted the absence of clear village-level arrangements for sharing benefits, resulting in economic gains circulating mainly among those already directly involved. These patterns suggest that unequal benefit distribution may be linked not only to market opportunities but also to institutional arrangements and differences in access and capacity.

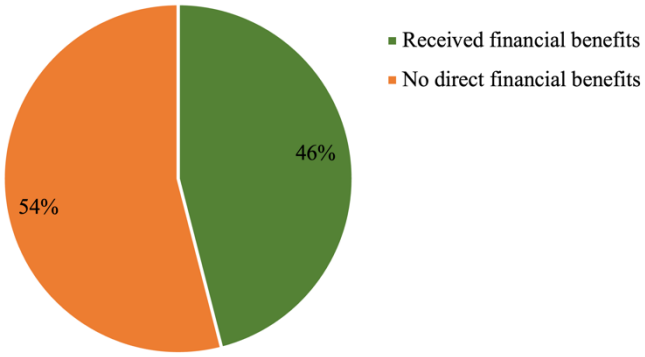


**Fig. 4**. Distribution of respondents based on access to direct financial benefits from tourism in Sawinggrai Village.

Viewed more broadly, the issue concerns not only who receives income, but also who has opportunities to access those benefits and who participates in shaping the rules by which benefits are distributed. This raises questions of fairness in both the distributive and procedural dimensions. Several respondents, for example, associated fairness not only with economic returns but also with participation, recognition, and access to opportunities. This is important because support for conservation is often influenced as much by perceptions of fairness as by the material benefits themselves.

In this context, benefit-sharing plays a broader role than simply distributing economic returns. It also influences trust, participation, and incentives for collective action, which in turn affect the long-term sustainability of conservation and tourism. From a social–ecological system perspective, this suggests that benefit-sharing serves as a mediating element linking governance arrangements with ecological sustainability, rather than being merely an economic outcome of ecotourism development. This is particularly relevant where conservation relies on ongoing community support. Similar concerns have been raised in studies showing that ecotourism functions as a conservation incentive not only through income generation, but also through governance arrangements perceived as equitable and legitimate (Gurney et al., 2021).

These findings highlight the need for more inclusive and transparent benefit-sharing arrangements, whether through collective village funds, locally agreed profit-sharing mechanisms, or broader access to tourism roles and capacity-building opportunities. Such measures are important not only for improving economic equity but also for strengthening social cohesion and the legitimacy of ecotourism as a community-based conservation strategy. In this sense, benefit-sharing is not regarded solely as a development outcome, but as part of the governance conditions that shape the resilience of the wider social–ecological system (Gustiarini et al., 2023).

### *3.5. Community-Based Integrated Mangrove Management Model for Ecotourism within the Framework of the Social–Ecological System (SES)*

Based on field research and analysis using the social–ecological system framework, a community-based mangrove management model was developed to integrate ecosystem conservation and sustainable ecotourism development in Sawinggrai Village (**Fig. 5**). Instead of treating ecological, social, and governance elements as separate components, the model understands them as interacting subsystems linked through feedback processes that influence management outcomes over time. In this model, sustainability is determined not by the strength of each component individually, but by how these components respond to change and reinforce or weaken one another through their interactions (Folke et al., 2021; Partelow, 2015).

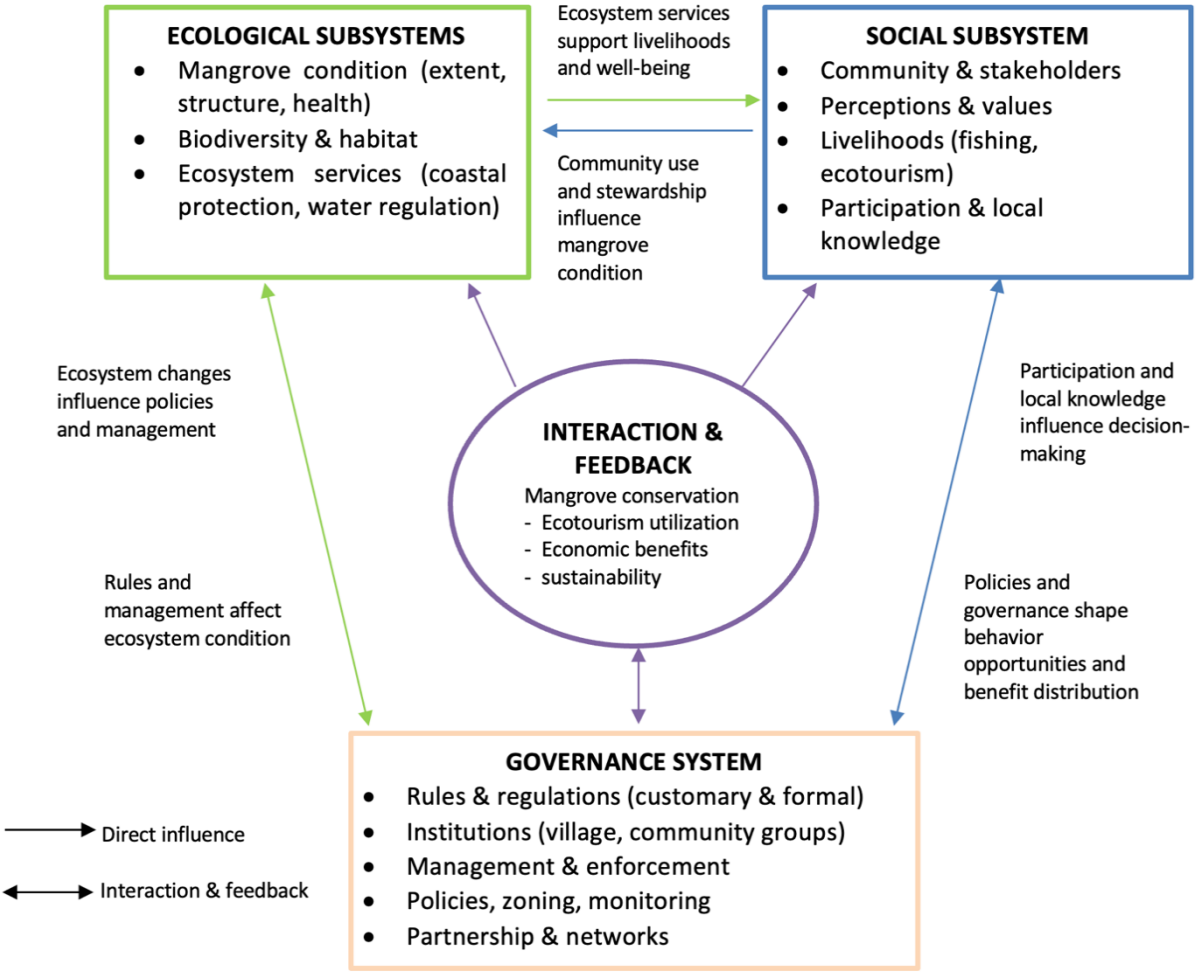


**Fig. 5**. Community-based mangrove management model within the framework of the social–ecological system (SES) in Sawinggrai Village.

Within the ecological subsystem, relatively well-preserved mangrove conditions underpin ecosystem services that support both conservation and ecotourism. These benefits can strengthen community incentives to support protection efforts, creating a positive feedback loop in which healthy ecosystems support livelihoods, while livelihood benefits reinforce conservation behavior. The model also recognizes the possibility of negative feedback. For example, increased tourism without adequate regulation may create ecological pressure, reducing ecosystem quality, weakening tourism attractiveness, and eventually diminishing both economic benefits and community support for conservation. Sustainability, therefore, depends on how these reinforcing and balancing feedbacks are managed.

The social subsystem focuses on local actors, including customary leaders, tourism stakeholders, and village communities, whose behavior is shaped by ecological awareness incentives, institutional access, and perceptions of fairness. In this model, equitable benefit-sharing is important because it influences trust, participation, and collective action, which in turn affect a community's capacity to respond to environmental or economic pressures. When benefit-sharing is perceived as fair, feedback tends to strengthen cooperation and adaptive management; when inequalities increase, the same feedback may weaken social support and reduce system stability (Bennett et al., 2021; Cinner et al., 2021).

The governance subsystem keeps interactions in check. Customary rules, village agreements, and formal support systems are understood not simply as regulatory structures, but as adaptive mechanisms that can respond to disturbances. Their role becomes important under conditions of stress, such as rising tourism intensity, external investment pressures, and environmental change. Under such disturbances, system resilience is reflected in the ability of governance arrangements to adjust rules, manage pressures, and maintain cooperation, without undermining ecological functions. In this sense, resilience

is not viewed solely as resistance to change, but as the system's capacity to adapt while maintaining its core functions.

Based on these dynamics, the proposed model comprises four interrelated components: ecosystem protection grounded in customary and village rules; strengthening local institutions and adaptive capacity; ecotourism development guided by environmental limits and local cultural values; and equitable benefit-sharing mechanisms. What distinguishes the model is not merely the inclusion of these components, but the emphasis on the feedback relationships among them. Benefit-sharing, for example, is positioned not simply as an economic output, but as a mediating mechanism linking governance effectiveness, collective action, and ecological sustainability.

The model also assumes that system resilience is tested not under ideal conditions but under disturbances. Pressures such as increased visitation, shifts in local leadership, and unequal distribution of tourism benefits may act as stressors that reveal whether governance arrangements are adaptive enough to maintain system stability. In this regard, resilience emerges from the system's capacity to absorb disturbances, reorganize when needed, and sustain feedback loops that support both conservation and livelihoods.

Conceptually, the model therefore moves beyond a structural representation of community-based mangrove management by emphasizing dynamic interactions, feedback loops, and adaptive responses within the wider social–ecological system. This provides a basis not only for village-level management practice but also for a more process-oriented understanding of community-based coastal governance in archipelagic settings.

## 4. Conclusion

This study suggests that the sustainability of community-based mangrove management in Sawinggrai is shaped less by individual ecological, social, or institutional factors than by their interactions within a social–ecological system. An important lesson from this case is that ecological integrity alone is insufficient to sustain conservation outcomes. What matters equally is whether governance arrangements, collective action, and benefit-sharing mutually reinforce each other over time. One contribution of this study is to demonstrate that benefit-sharing is more than just an economic by-product of ecotourism. It also shapes trust, participation, and incentives for conservation, making it a crucial link between governance and ecological resilience. This offers a broader understanding of community-based mangrove management, particularly in archipelagic settings where livelihood security and ecosystem sustainability are closely connected. From a practical standpoint, the findings suggest that long-term mangrove governance depends not only on protecting ecosystems but also on building adaptive, inclusive institutions that are seen as legitimate by local communities. Therefore, the Sawinggrai case points to a broader lesson: sustaining coastal ecosystems is inseparable from sustaining the social relationships and governance arrangements that support them.

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**Author Contributions:** N.T.: Conceptualization, Methodology, Investigation, Formal Analysis, Writing-Original Draft Preparation, Writing – Review and Editing; N.S.: Investigation, Writing – Review and Editing; Y.K.: Conceptualization, Writing – Review and Editing; Y.M.: Investigation.

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**Data Availability Statement:** The datasets generated and analyzed during the current study are not publicly available but are available from the corresponding author upon reasonable request.

**Conflicts of Interest:** The authors declare no conflict of interest.

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