

# Local Institutional Collaboration Models for Coastal Communities in North Sumatra

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## Abstract

*The social network of those managing mangrove forests sustainably in the districts of Langkat and Batu Bara is the subject of this study. The state of affairs indicates that the government has not been able to collaborate with stakeholders on mangrove forest management projects involving the local community that are systematic, synergistic, and sustainable. Finding a network of stakeholders is crucial to designing a mangrove forest management program holistically and sustainably. Stakeholders in the Nibung H Angus Sub-district, Batu Bara Regency, namely Lubuk Kertang Village, Pasar Rawa Village, Tapak Kuda Village, and Bagan Baru Village, maintain mangrove forests symmetrically through cooperative efforts. Rehabilitating degraded mangrove forests is heavily impacted by the structure of current networks, which includes social and economic construction and tenure components or rights to forest property. This research aims to determine the structure of networks and the function of stakeholders—actors and institutions—in managing mangrove forests. Descriptive analytic approaches were employed in the qualitative conduct of this study.*

**Keywords:** Social Network, Social Mapping, Stakeholders, Mangrove Forest Management

## INTRODUCTION

Mangrove forest management in the Langkat and Batu Bara Regencies of North Sumatra affects the socio-economic life of the people who live around the area adjacent to the mangrove forest area. Various mangrove forest rehabilitation programs by multiple parties have accelerated the addition of mangrove forest areas. The results of updating the national mangrove map (PMN) data in 2021 show an increase in area compared to the PMN area in 2013-2022, from 3,311,245 Ha to 3,364,080 Ha (National Mangrove Map, 2022). Based on data on mangrove forest areas for the 2019 period, the area of mangrove forest cover in Langkat Regency and Batubara Regency per 10 years experienced uneven dynamics. Some sub-districts have increased and decreased mangrove areas. In contrast, one partnership program has turned mangrove areas into ecotourism areas, such as those in Rawa Village, Gebang District, and Lubuk Kertang Village, West Brandan District.

The instability of mangrove forest areas in the Langkat and Batubara districts is due to the weak synergy of multi-stakeholder programs in sustainably managing mangrove forests. Obstacles were found that showed the weak synergy of government programs and stakeholders in managing mangrove forests, so in the implementation process, there were often overlaps in running programs, especially the involvement of local community participation. Stakeholders walk alone with their respective programs. The Langkat District Government seems confused about starting cooperation with stakeholders in managing mangrove forests. Likewise, stakeholders do not understand the direction of the Langkat District Government's policy in managing mangrove forests. This condition encourages researchers to design a model of social mapping of stakeholder networks to establish the synergy of stakeholder networks as mangrove forest managers.

## THEORETICAL FRAMEWORK

### Mangrove Forests and Cultural Ecology

The east coast waters of North Sumatra Province are part of the Malacca Strait waters and have significant potential marine fisheries resources. The East Coast of North Sumatra has a coastline of 1,300 km and is a

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coastal area with a vast mangrove expanse reaching 74,417.80 ha (MOE, 2012; DKP Sumut, 2014). Mangrove forests stretch from the east coast of Langkat Regency to Labuhan Batu Selatan Regency with varying thicknesses (Muhtadi et al., 2016).

Mangroves grow on sheltered or flat beaches, usually along the wind-sheltered sides of islands or behind sheltered offshore reefs. Most mangrove species grow well on muddy soils, especially where silt has accumulated. Mangroves grow and develop in ecotone (transitional) ecosystems whose existence is strongly influenced by terrestrial and marine factors (Hogarth, 2007). One of the terrestrial factors that influence the existence of mangroves is human activity, which interacts with each other.

Thus, behavior by the individual underlies the emergence of the behavior itself. Humans live in social groups with different environmental conditions. This difference can cause misunderstandings between groups if there is mixing and social interaction (Rudito et al., 2008). Social mapping is used to describe patterns of social relationships between individuals or communities that are observed. Social mapping is essential for researchers to see the potential closeness of existing relationships. Mapping is generally done to see the potential or opportunities that can be developed in community groups. Several types of mappings include community profiling, community asset mapping, and social mapping (Gunawan et al., 2021).

Social mapping becomes more meaningful if this study's results can explain the core cultural parts of a dynamic cultural system. According to Steward (1955), cultural ecology theory describes the core part of the cultural system as responsive to adaptation because adjusting to ecological pressures will directly affect the core elements of a social structure. To remain productive, the process of cultural change is simultaneously brought about by outsiders and within the community itself. In the context of this research, cultural ecology theory is relevant to use, considering that conservation activities carried out by mangrove forest managers are created into various forms of cooperation in an intertwined network of stakeholders, thus requiring analysis combined with social mapping.

Social mapping is creating geographical and spatial representations in graphical, rather than verbal, form that encapsulates everything in a community. Social mapping allows people to create maps to express the stories of their lives and places. Social mapping can also be seen as a learning process to understand the condition of the community and to plan actions that should be taken to improve the condition of the community or to encourage community progress. Community members come together during mapping and share information (Lyndon, 2003).

### **Stakeholder Actors, Institutions, and Social Networks**

The role of actors and institutions in mangrove forest management can explain how each actor's role (influence and interests) in the sustainability of mangrove forest management in Langkat Regency and Batubara Regency. This actor analysis can be done by scoring the sustainability of mangrove forest management in Langkat District and Batubara District. The results of this scoring can be analyzing each actor against other actors conducted during the interview. An analysis of the involvement of actors and stakeholder institutions was carried out on the existence of mangrove forests in the four villages. The mapping results can explain how the actor's position in mangrove forest management is divided into four quadrants: subject, key players, crowd, and context setter (Mustika et al., 2017).

Actors and institutions involved in mangrove forest management in Langkat and Batubara districts may come from several circles of government agencies, entrepreneurs, NGOs, and community organizations. Each actor has different interests in mangrove forest management. Differences in interests and authority in mangrove forest management can cause social problems and also be able to build the potential for socially solid capital because each actor and institution, as a stakeholder, tries to utilize the authority they have for their interests (Febryano et al., 2015).

### **Community Participation in Sustainable Mangrove Forest Management**

According to Simbolon (2010), the massive destruction of mangrove forests for conversion to aquaculture and plantations has disrupted the life cycle of fish and shrimp resources. Reducing marine life in this area means

reducing the income of small fishermen who operate around the coast, netting shrimp, crabs, and fishers. In particular, Fakhurrozy (2015) states that ecosystem damage in North Sumatra Province is motivated by factors such as relatively low levels of community income, illegal logging, the illegal opening of shrimp ponds, misperceptions about mangroves, and weak law enforcement.

Community participation is a form of social interaction that concerns various social science disciplines. According to some experts, participation is an effort to participate in an activity associated with development. It will be an effort to participate in development. Community participation is essential for successful growth. To improve mangrove ecosystem management, involving the community in the planning process and sustainable management of this ecosystem is necessary. Sustainable management of mangrove ecosystems can be developed through socio-cultural methods of local communities that are friendly to mangrove ecosystems through counseling, lighting, and raising public awareness about managing mangrove ecosystems.

Conservation strategies involving local communities are seen as more effective than one-way conservation involving only the government. By increasing public awareness of the importance of the conservation function in an area, it will be able to maintain the ecosystem balance function and the economic function of the area for the local community, so with the environmental ecosystem balance, it is expected to achieve optimization and sustainability in the management of the area (Erwiantono, 2006). The community perceptions studied in this study are related to the thoughts and opinions of the community about issues and actions related to the preservation and utilization of mangrove forests (Gumilar, 2012). Community perceptions of mangrove forests and the planting plan that will be implemented are essential to monitor community perceptions of mangroves.

## **RESEARCH METHOD**

This research uses a qualitative approach with descriptive analysis techniques to identify and analyze the form of networks, the role of stakeholders (actors and institutions) as mangrove forest managers, and government involvement in the network of stakeholders (actors and institutions) managing mangrove forests. Descriptive analysis techniques are carried out to explore data and information about the process or mechanism of the relationship between research subjects, presenting primary data, creating new categories and classifications based on conceptual order, or analyzing diverse data and information into interrelated phenomena (Moleong, 2003).

Researchers will enter social conditions based on the community's perspective (emic view) comprehensively and holistically through involved observation (participatory observation) and in-depth interviews of mangrove management activities carried out by existing stakeholders (Bungin, 2017). This activity will obtain forms of multi-stakeholder involvement in mangrove management networks.

The data sources used in this research include primary and secondary data, the sources of each of which are as follows:

### **Primary Data**

Primary data is obtained directly through in-depth interviews or focus group discussions (FGDs). The instrument used is an interview guide so that the primary data collection process becomes more focused. Primary data is needed in the form of networks and the role of stakeholders (actors and institutions) as mangrove forest managers.

### **Secondary Data**

Secondary data is data obtained indirectly from the object under study, which, among others, is done through literature studies, archives, and reports, such as:

Data on mangrove forest management given by the Government of Langkat Regency to the village and other authorities already existing there.

Data about the general condition of the research location includes geographical and demographic conditions. Other data were obtained from BPS, District, Village, and related agencies.

This research was conducted in four villages: Lubuk Kertang Village, West Brandan Subdistrict, Pasar Rawa Village, Gebang Subdistrict, Tapak Kuda Village, Tanjung Pura Subdistrict, Bagan Baru Village, Nibung Hangu Subdistrict, and Langkat Regency. The determination of the research location is based on the consideration that the two villages have developed mangrove conservation behavior by managing mangrove forest areas based on ecotourism. Informants in this study consisted of base informants and key informants. The determination of base and key informants is based on the criteria of informants encountered in the field based on the snowball determination of base informants and subsequent informants (Moleong, 2003). There is no restriction on the number of informants as long as they fulfill the adequacy of field data.

The qualitative data analysis used in this research is descriptive, using ongoing analysis techniques to analyze actors and institutions as stakeholders by comprehensively mapping social networks in mangrove management.

## RESULT AND DISCUSSION

### Socio-economic Life of Communities in Mangrove Forest Management

Mangrove forests are a buffer zone for the lives of Langkat coastal communities from the threat of abrasion. In addition, mangrove forests also function economically for local communities that make a living as fishermen by determining the catch zone that does not have to go far into the middle of the sea to catch fish. The existing condition of mangrove forests in Langkat Regency has experienced ups and downs regarding mangrove cover area. Changes in the mangrove forests in Langkat Regency are motivated by mangrove management activities carried out by local communities that continue to log for the charcoal-making industry, firewood, and scaffolding. Changes in mangrove forest areas into non-forest areas are caused by human activities that change land use into aquaculture and oil palm plantations. The measurement results of BPDAS Wampu Sei Ular (2006) show that mangrove land conversion into ponds increased to 7,397.47 ha (Onrizal, 2010).

The degradation of the quality and quantity of mangrove forests in the coastal areas of Langkat Regency has negatively impacted the community's survival. With increasing abrasion events, fishermen's fishing zones are increasingly distant, decreasing the number of coastal fishery catches due to seawater intrusion into the land. The case of the sinking of Tapak Kuda Island, Tanjung Pura District, Langkat Regency, became concrete evidence of mangrove forest destruction in Langkat Regency (Onrizal et al., 2008). Even the destruction of mangrove forests in Langkat Regency within 30 years has lost 30% of the total area of mangrove cover, and damaged mangrove forests in Indonesia have reached 57.6% (Hamzah et al., 2020).

The mangrove forest in Lubuk Kertang Village, West Brandan Sub-district, has a mangrove expanse of 1,200 ha with a planting pattern of 1–3 and a density of 3,300 trees per ha. This condition has decreased significantly from year to year. The rate of deforestation increased from 2005 to 2010. Various human activities massively damage mangrove forests. The population and economic needs are increasing, causing people to change land use for timber production activities, ponds, and oil palm plantations. Ironically, the clearing in the region was not accompanied by the replanting of mangrove forests that were cut down. Based on research results in the field, the condition of mangrove forests in Lubuk Kertang Village has experienced severe damage. Information on the extent of damage reached 500–700 hectares in 2010.

The socio-economic life of the Lubuk Kertang Village community currently has strong interactions with mangrove forests in terms of managing and utilizing them. Understanding how to keep mangrove forests sustainable has been ongoing for a long time but has not been identified in the form of local traditions and culture, including mangrove forest conservation in Lubuk Kertang Village. The identified habits in managing mangroves result from introducing external parties who provide learning to local communities about conservation knowledge and the use of mangroves to produce products derived from mangroves (Jam et al., 2018). This is manifested in various forms of creation, such as handicraft mats, hat bags, culinary mangrove chips, and mangrove syrup. The mangrove area is also used to cultivate mangrove crabs and fish, and it is already a tourist attraction.

Pasar Rawa Village is also surrounded by coastal areas, with some parts of the mangrove area becoming protected forest areas. However, some areas have begun to be converted into oil palm plantations and shrimp ponds by utilizing protected forest areas as private plantations. With limited transport that can only be reached in some areas, it has led to an initiative by the parties to manage the forest area. This factor has led to the depletion of the mangrove forest area in Pasar Rawa Village.

Changes in mangrove forest areas are inseparable from protected forest management in Pasar Rawa Village. Problems related to unclear ownership or status of land converted by the community. Determining land boundaries does not involve the participation of the community and village officials, who play an essential role in determining land boundaries. Different views among communities on the use, conversion, and utilization of land were due to low community knowledge of forest boundaries and utilization regulations, which prevented communities from utilizing land individually and, at the same time, opened up opportunities for entrepreneurs to use forest areas as land for plantations, industry, and so on.

### **Social Network of Stakeholders (Actors and Institutions) in Mangrove Management**

The potential of mangrove forests can be utilized as ecotourism destinations, fish farming, crab farming, and shrimp farming. Existing mangrove trunks are used daily as firewood, charcoal-making materials, leaves for chips, and mangrove syrup. Types of mangrove vegetation can be handicrafts woven into mats, bags, and hats made from a type of mangrove called purun.

Stakeholders who manage mangrove forests in Lubuk Kertang Village form a symmetrical relationship. The initiated group system comprises Mekar Mangrove Group, Bakau Emas Group, Lestari Mangrove Group, and Teluk Indah Mangrove Group. The forms of existing networks include aspects of tenure (forest land tenure rights) and social and economic construction, and they significantly influence mangrove damage. They can also help rehabilitate degraded mangrove ecosystems, especially in Lubuk Kertang Village. In this scope, social networks can be understood to determine access rights, management rights, and governance over mangrove forests. Involving social relations and institutions.

In the mangrove forest land ownership system, the Lubuk Kertang Village community recognizes that the government owns the area through social forestry with the principle of partnership. The community can access mangrove resources with existing rules. Parties that utilize mangrove forest land include individuals and groups of Mekar Mangrove, Bakau Emas Group, Lestari Mangrove Group, and Teluk Indah Mangrove Group. Lubuk Village Government Institution is a "connector of tongues" between groups and government laws in managing and deciding about mangrove forest resources related to regulations issued by the village government.

The knowledge of the Pasar Rawa Village community is that the mangrove forest is a protected forest area managed by the state, so a group was formed at the initiative of the local community. This group is called the Lembaga Pengelola Hutan Desa (LPHD), chaired by Rudy Irwansyah. The LPHD group has collaborated with many parties, including the KLHK government, the Ministry of PDT, BUMN, private companies, universities, and NGOs (Yagasu).

### **Actor and Institution Analysis of Stakeholder Social Networks**

The involvement of actors and institutions as mangrove forest managers plays a role (influence and interests) in the sustainability of mangrove forest management in Langkat District. An analysis of actors and institutions can be done with cohesion that influences sustainability in mangrove forest management in Langkat District. According to Febryano et al. (2015), the actors and institutions involved in mangrove forest management in Langkat District can be categorized as forming a symmetrical relationship. The pattern of social relations is based on the principle of partnership, which consists of various groups, such as government agencies, entrepreneurs, NGOs, and community organizations. Each actor and institution has different interests following the authority it has obtained. This difference can cause social tension and also build solid social capital potential.

Actors and social networks as stakeholders in Lubuk Kertang Village and Pasar Rawa Village show a symmetrical pattern based on the principle of partnership. Communities can access mangrove resources with

existing rules. Parties that utilize Lubuk Kertang mangrove forest land include individuals (Hadyan Jamili Batubara), Mekar Mangrove groups, Bakau Emas groups, Lestari Mangrove groups, and Teluk Indah Mangrove groups. Meanwhile, Pasar Rawa Village has a figure named Rudy Irwansyah, who founded the Lembaga Pengelola Hutan Desa (LPHD) group.

## CONCLUSION

The potential of mangrove forests in Langkat Regency is utilized as an ecotourism destination, as well as fish farming, crab farming, and shrimp farming.

The socio-economic life of the community has a strong interaction with mangrove forests in managing and utilizing them. Understanding how to keep mangrove forests sustainable has been ongoing for a long time but has not been identified in the form of local traditions and culture.

The form of habits in managing mangroves identified is the result of the learning process from external parties who provide learning to local communities about conservation knowledge and the use of mangroves to produce products derived from mangroves.

Stakeholders who manage mangrove forests in Lubuk Kertang Village form symmetrical relationships. The existing networks have a significant influence on mangrove damage while providing usefulness for efforts to rehabilitate degraded mangrove ecosystems.

social networks can be understood to determine access rights, management rights, and governance of mangrove forests in terms of social and institutional relations.

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