

Local Ecological Knowledge on Mangroves Among Tambakrejo Community in Northern Semarang: The Case of CAMAR Community

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Abstract. KPL Camar, on the coast of Tambakrejo Village, Tanjung Mas, Semarang City, was born from a CSR program. After the program ends, the initiative and motivation of KPL Camar members are very important for the sustainability of conservation. Facing abrasion, accretion, land subsidence, and dependence on coastal ecosystems, KPL Camar members chose to continue conservation. This research aims to explore mangrove conservation practices in the KPL Camar from an ecological anthropology perspective, understand the role of the Camar KPL as conservation participants and part of the coastal ecosystem, and link mangrove conservation with livelihoods. This research uses a qualitative method with a case study conducted in the Tambakrejo Fisherman's Village, Semarang. The main findings show that the mangrove conservation practices carried out by KPL Camar are divided into conservation based on human-environment relations and conservation for livelihood systems. This reflects the narrative of environmentally friendly living and responsible use of nature. These social-ecosystem interactions change people's views and values towards the environment. Members of KPL Camar internalize conservation values and develop cultural practices that are more environmentally friendly. The results of this research highlight the importance of community participation in conservation practices and its impact on welfare and environmental sustainability.

Keywords: KPL Camar, conservation, human ecology.

1 Introduction

Coastal communities living in coastal areas and depend on natural resources in these regions are highly vulnerable to ecological threats such as environmental degradation, biodiversity loss, severe weather, and land subsidence [1-2]. Their livelihoods rely heavily on the environment as a living space and a source of sustenance. As an archipelagic country with the second-longest coastline in the world, Indonesia faces serious threats related to these ecological issues [3]. Furthermore, many major cities with high mobility, development, and economic activity are located in coastal areas, making them susceptible to these problems. Semarang is one of the major cities in Indonesia, and its coastal areas are under threat. Based on geodetic studies from 1980 to 2010 show that land subsidence rates in Semarang vary spatially from 1-10 cm/year [4]. Tidal flooding, abrasion, and environmental degradation exacerbate the conditions of the northern coastal area of Semarang. To mitigate these impacts, Semarang's government and coastal communities are undertaking various efforts, including mangrove planting, to create a green belt along the coast [5-6].

One effort to preserve the mangrove ecosystem is through environmental conservation activities. In Semarang, the implementation of mangrove conservation is regulated through Regional Regulation Number 14 of 2011 concerning the Semarang City Spatial Planning Plan for 2011-2031. Community involvement is realized through Environmental Care Groups (KPL)

such as KPL Camar, which focuses on preserving and utilizing mangroves. The KPL Camar was initiated by Pertamina company's Corporate Social Responsibility (CSR) Program, which targets the Tambakrejo area of Semarang. This group has several characteristics as a conservation group: the majority of its members are fishermen; was initiated by an external program in the form of CSR; and seeks to preserve the coastal environment and adapt to climate change [7-9].

In anthropological studies, environmental conservation is part of the new era of anthropology, which emphasizes sustainability and the importance of the role of humans or society as participants in conservation activities [10-11]. In practice, implementing environmental conservation consistently involves local communities as guardians of their ecosystem. Likewise, mangrove conservation was carried out by KPL Camar in Tambakrejo, Semarang. KPL Camar is an active conservation group that preserves mangroves in its ecosystem. This raises questions about human-environment interactions resulting from these conservation practices. In 1985, Rambo introduced the human ecological systems model, which studies human-environment interactions. This model views the interaction between two subsystems in the human ecosystem, the social system and the ecosystem, where the interaction creates an exchange of energy, materials, and information [12]. Therefore, this research seeks to explore the mangrove conservation practices by KPL Camar from an ecological anthropology perspective, understand how KPL Camar carries out its role as a conservation participant and part of the coastal ecosystem, and link mangrove conservation to its livelihoods.

2 Methods

This research uses qualitative research with a case study method. This research answers the problem formulation related to the dynamics of mangrove conservation carried out by KPL Camar and its role as a conservation participant and part of the coastal ecosystem. Thus, the unit of analysis in this research is KPL Camar. This research was conducted in the Tambakrejo Fisherman's Village area, Tanjung Mas Village, North Semarang District, Semarang City, from December 2023 to February 2024. Determining informants was carried out using a purposive sampling technique. This research used four data collection techniques. The case study method is explained by in-depth interviews, participant observation, documentation, and archival records [13].

3 Result and Discussion

The human-environment interactions in mangrove conservation practices carried out by KPL Camar cannot be separated from the exchange of energy, materials, and information between KPL Camar as a social system and Tambakrejo as an ecosystem. These two subsystems are also influenced by other subsystems, which shape the dynamics of these interactions.

3.1. Tambakrejo Vulnerability and Ecosystem Dynamics

Tambakrejo Village in Semarang City is facing serious challenges in the form of sea abrasion. Based on the latest study, the level of abrasion along the coast of Tanjung Mas Village, where Tambakrejo is located, ranges from 0.01 to 13.58 meters per year, which threatens the sustainability of the pond area and community settlements [14]. This abrasion phenomenon not only threatens the village's physical existence but also impacts the main livelihood of the population, most of whom are fishermen. Based on their livelihood system, the people of Tambakrejo began to divide into several groups, namely modifying fishing gear, becoming

aquaculture fishermen, and leaving the marine and fisheries sector. In the context of mangrove conservation, members of the Camar KPL respond to changes in the ecosystem. In describing Tambakrejo's vulnerability, all informants said that abrasion was the main problem that made Tambakrejo even more vulnerable. Their first response to this condition was to find a solution to save the region. The CSR program brings them together in one goal at KPL Camar. As a community that cares about the environment, KPL Camar aims to overcome abrasion, save the environment, and restore the Tambakrejo ecosystem to having mangrove forests.

3.2. Motivation of KPL Camar Members and Formation of the Social System

Pertamina company's CSR program, which accompanies KPL Camar in conservation activities, lasts five years, after which KPL Camar will continue independently. After the CSR program, KPL Camar members were motivated by saving the environment, social relations, and livelihood systems. Experiences of vulnerability, external education, and interactions with various agencies such as government, academics, corporations, media, and the Tambakrejo community drove all of this. Academics dominate in shaping KPL Camar's view of human-environment relations. The cultural values of coastal communities, such as respecting and protecting nature, solidarity, cooperation and prosperity, also form the basis of their relationship with the mangrove ecosystem. Mangrove conservation knowledge and practices were gained through interactions with various agencies, which changed the practice of protecting nature without changing the basic philosophy. KPL Camar, as a formal group with strong ties between members, collaborates with nature to save the region. Knowledge from external agencies regarding the ecological and economic benefits of mangroves also shapes the conservation practices of the KPL Camar, including the development of community empowerment.

3.3. KPL Camar Mangrove Conservation Practices

KPL Camar applies two models of mangrove conservation practices: human-environment relationships and livelihood systems. In the context of human-environment relations, the view of the sea and coast as the basis of life is reflected in planting, caring for, and monitoring mangroves and education about the importance of mangroves. The four types of mangroves planted in Tambakrejo, namely *Rhizophora Mucronata*, *Rhizophora Apiculata*, *Avicennia Alba*, and *Avicennia Marina*, were selected based on academic knowledge and the condition of the Tambakrejo ecosystem. Planting is done, but with the spiritual belief that planting must be done in a pure and clean heart, swaying mangroves are considered a remembrance. This belief is supported by the Islamic religion, which emphasizes love for all of God's creatures. More than 500,000 mangrove seedlings have been planted in around 1.5 hectares. KPL Camar continues to expand the conservation area and add new sediment to form a natural mangrove forest. They continue to plant through the commitment from the KPL Camar and its dynamics as a social system. This practice produces feedback from the ecosystem in the form of oxygen, natural embankments that are strong enough to resist abrasion, and spawning grounds for marine biota, which are the source of life for the coastal communities of Tambakrejo. The reciprocal results were told by informants who felt the benefits of conservation. However, the main benefits that dominate are related to the livelihood system.

Mangrove conservation practices in the context of livelihood systems are also still related to views regarding the sea and coast as the basis of life for the Tambakrejo community. At KPL Camar, a view develops the concept of humanity, which must also be applied to plants and animals. In ecological anthropology, the relationship between social systems and ecosystems that

bind humans puts them in the same position as nature. In this way, the use of an initially exploitative nature can be carried out with full wisdom. Practices in this context include making mangrove seedlings which can later be sold to guests who will plant them in Tambakrejo, developing ecotourism in the form of Mangrove Edupark Tambakrejo, and empowering women's groups of wives of members of KPL Camar (Kelompok Merah Delima) who develop processed mangrove forest products, such as fruit and leaves to serve as souvenirs. KPL Camar's vision and mission regarding community welfare are lines that connect conservation practices with human needs for the use of natural resources. Through these practices, KPL Camar members can slowly feel the economic benefits of the existence of mangrove forests. The conservation model, which is considered pro-environment and pro-welfare, makes conservation their chosen strategy in responding to nature. When viewed in the human ecological system model, conservation is a model that is considered good and appropriate in the interaction between social systems and ecosystems.

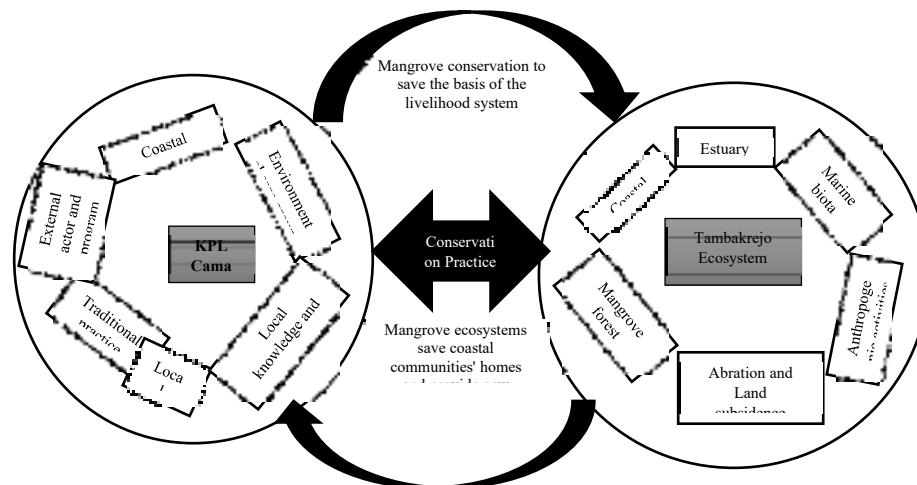


Fig 1. Interaction Between Social System and Ecosystem

4 Conclusion

KPL Camar, on the coast of Kampung Tambakrejo, Tanjung Mas, Semarang City, was born from CSR program. After the program ended, the initiative and motivation of KPL Camar members became the key to sustainable conservation. Facing abrasion, accretion, and land subsidence, as well as being dependent on coastal ecosystems, members of KPL Camar chose to continue conservation based on their motivation to save the environment, social relations, and livelihood systems. They developed a new social system as a conservation group, understanding mangrove conservation as balancing the ecosystem and increasing welfare. Their practices involve human-environment relationships and livelihood systems, reflecting a narrative of eco-friendly living and responsible use of nature. Reciprocity from the mangrove ecosystem provides environmental balance and prosperity through mangrove products. These social-ecosystem interactions change human views and values towards the environment, with members of the KPL Camar internalizing conservation values and developing more environmentally friendly cultural

practices, demonstrating adaptation to ecosystem changes and awareness of the harmonious relationship between humans and nature.

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