

Mangroves and Gender Roles: A Case Study of Desa Energi Berdikari Sepatin

Abra Arimagupita Sekarsoca

{sekarsoca20@gmail.com}

Pertamina Foundation, Indonesia

Abstract. This study explores the intersection of mangroves and gender roles in Sepatin Village, Indonesia. In the backdrop of Indonesia's rich maritime landscape, the mangrove ecosystems, despite being the world's largest, face threats from conflicting interests. Pertamina's Blue Carbon Initiative Project, centered in the Pertamina Mahakam Forest, exemplifies sustainable practices and community empowerment. Using a participatory approach, the research investigates women's nuanced roles in preserving the mangrove ecosystem. The unique challenges of Desa Energi Berdikari Sepatin highlight the village's exceptional commitment to environmental preservation, despite limitations. Findings underscore mangroves' integral role in various community capitals and reveal distinctive gender roles, emphasizing the need to empower women in mangrove forest management. The study advocates for inclusive, equitable, and sustainable environmental project management, recognizing gender dynamics for successful initiatives. Insights from Sepatin Village contribute to a broader understanding of the intricate relationship between communities and ecosystems.

Keywords: Gender, Mangroves, Ecosystem, Women, Community, Conservation, Environment, Coastal, Sustainability

1 Introduction

Indonesia, acknowledged as a global maritime leader, boasts an extensive coastline of around 95,181 square kilometers and a maritime territory covering 5.8 million square kilometers. Despite having the world's largest mangrove forest, these ecosystems face imminent threats due to conflicting interests, conservation challenges, and development sidelining environmental considerations. Data from the Central Statistics Agency (BPS) reveals that Indonesia has approximately 3.63 million hectares of mangrove ecosystems, constituting about 20.37 percent of the world's total mangrove population. Over the past three decades, almost 800,000 hectares of mangrove forests have undergone logging and conversion, necessitating collaborative efforts for conservation and rehabilitation.

Pertamina, as Indonesia's largest energy company, has actively responded to the challenges of climate change, particularly focusing on greenhouse gas emissions and ecosystem degradation. Recognizing the urgency for climate change mitigation and adaptation, Pertamina is actively engaged in nine priority projects during the G-20 Presidency in Bali. A pivotal initiative within these projects is the Blue Carbon Initiative Project by Pertamina.

Dedicated to the rehabilitation and restoration of coastal and marine ecosystems, alongside empowering local communities, the Blue Carbon Initiative Project is central to Pertamina's commitment to Sustainable Development Goals (SDGs). The Pertamina Mahakam Forest, a tangible manifestation of this initiative, involves reforestation and conservation efforts in the mangrove forest area, underscoring social and environmental responsibility.

Pertamina's strategic steps toward the energy transition include innovative projects such as Desa Energi Berdikari Sepatin located within the Pertamina Mahakam Forest Area. This village serves as an exemplary model for sustainability in energy and the environment, demonstrating the positive impact of the Blue Carbon Initiative at the local level. The community actively engages in this sustainable project, contributing to the preservation of the mangrove ecosystem.

This harmonious collaboration among Pertamina and the local community presents a compelling narrative of corporate social responsibility, environmental stewardship, and community engagement. The ongoing research aims to uncover the nuanced roles and contributions of women in preserving the mangrove ecosystem in Sepatin Village. By considering socio-cultural dimensions beyond monetary values, this investigation aligns with government initiatives for the Energy Transition towards net-zero emissions by 2060. Spearheaded by Pertamina Persero through the Pertamina Foundation in the Blue Carbon Initiative Program, this research utilizes Hutan Pertamina Mahakam as a pertinent case study in the broader context of Indonesia's evolving energy landscape.

2 Research Methodology

In the framework of this research, the researchers applied a deep and diverse participatory method. This method is key to understanding participant behavior and the factors influencing their behavior. Interviews were used as the primary instrument to gather further information. In the interview context, the participatory approach went the extra mile, with researchers not just listening but also trying to feel and understand the perspectives of the interviewees. During the interview process, researchers also noted important information to document participant observations and interactions.

In addition to interviews, researchers actively explored the Sepatin Village area, which includes the mangrove forest environment. This was done to gain a deeper visual understanding of the location, abundance, and diversity of the local mangrove community. This field exploration helped researchers contextualize interview results with personal experiences in the mangrove forest environment. Researchers also attempted to understand which parts of the mangrove forest were most utilized by the community and the extent of their benefits.

Informal observations were also conducted during field research. This included researchers staying temporarily in Sepatin Village to gain a deeper understanding of local culture and how participants interacted with their daily environment, such as their work and interactions within the surrounding community. This approach helped researchers immerse themselves in the dynamics of participants' daily lives and understand their context better.

• Respondent Selection

The selection of respondents involved a thoughtful and purposive approach. Respondents were chosen based on specific criteria that align with the objectives of the study. Criteria such as direct involvement in mangrove preservation activities, gender roles within the community, and a diverse representation of the population were considered. The primary focus was on key stakeholders, the driving forces behind the environmental initiatives in Desa Sepatin. The ‘snowballing’ technique was also employed, wherein participants were asked to recommend acquaintances with relevant knowledge or experience for the study.

Table 1. Name of the informants and their position

Kepala Desa Energi Berdikari Sepatin	Arianto
Ketua PKK	Isteri Arianto
Sekretaris PKK	Ani
Bendahara BUMDES Sepatin	Tija
Bendahara Bumdes Sepatin	Ucil

Desa Energi Berdikari Sepatin presents a unique aspect in the context of this research. Despite being only an hour away from Samarinda, the village's isolation due to challenging transportation, accessible only via speedboat, adds an additional layer of difficulty in obtaining basic facilities like clean water and electricity. Furthermore, demographic challenges, including uneven access to education and a portion of the population being illiterate, color life in Desa Sepatin.

However, despite these challenges, Desa Sepatin demonstrates an exceptional commitment to environmental preservation. The village has gained recognition for its active involvement in various environmental projects, particularly in mangrove planting initiatives conducted in collaboration with the Pertamina Foundation. Notably, Desa Energi Berdikari Sepatin played a vital role in the success of the Pertamina Forest in 2022, actively engaging in land clearance and mangrove planting activities. During that year, the Pertamina Forest successfully planted one million mangroves as part of its environmental conservation efforts.

Desa Sepatin's significant contributions were spearheaded by members of the Kelompok Tani Hutan (KTH) Buji Lestari and KTH Sinar Saeba Lestari. These groups actively participated in clearing land and planting mangroves at various locations, including Lokasi 3 (Dumping Area – Golf Channel) and Lokasi 4 (Tunu F Island), as well as Lokasi A, Lokasi B, Lokasi C, Lokasi D, and Lokasi E. Their involvement underscores the village's dedication to environmental sustainability and its integral role in the success of mangrove preservation initiatives in collaboration with the Pertamina Foundation.

• Scope of Questions and Data Reduction Process

The data analysis process will involve categorizing the results based on the theoretical framework, specifically the Community Capitals Framework (CCF). The questions posed during interviews were strategically crafted to align with the key dimensions of the CCF. These

dimensions encompass various forms of capital, including social, human, cultural, natural, and economic capitals.

The responses gathered will be meticulously organized and coded to identify recurrent themes and patterns associated with each capital category. This systematic approach aims to unravel the multifaceted contributions made by the participants in sustaining the community's overall well-being.

By utilizing the Community Capitals Framework, the analysis seeks to provide insights into how the community leverages its diverse capitals to maintain and enhance various aspects of livelihoods. The framework serves as a comprehensive tool to assess the interplay between environmental preservation, gender roles, and community development. This holistic perspective ensures a nuanced understanding of the intricate relationships within Desa Sepatin, shedding light on the community's strengths and areas for potential enhancement.

3 Research Findings

In the coastal area of East Kalimantan, Indonesia, fishermen generally use simple equipment to exploit marine resources due to limited capital. Gender division of labor still applies in this region, with men as breadwinners at sea and women as household caretakers. However, in the era of modernization, women are becoming more active in social and economic activities, supporting both their families and the local economy.

In Sepatin Village, Anggana District, Kutai Kartanegara Regency, women's role in sustaining daily life is becoming increasingly significant. The wives of fishermen in this area have dual roles as homemakers and significant contributors to increasing family income. Therefore, the government needs to pay special attention to women in fishing communities to improve family welfare.

However, besides family welfare, environmental issues also receive significant attention in Sepatin due to direct impacts like coastal erosion. The community, especially the fishermen, heavily relies on coastal and marine resources in their social and economic aspects.

To achieve these goals, a community empowerment program with a gender focus is required. However, field observations indicate that community empowerment, particularly for women, is not yet optimized, and women's participation in improving family economics remains low.

Women are responsible for daily household chores and have a significant role in many aspects of the mangrove reforestation project compared to men, who are more involved in specific tasks. Women's participation is higher in the development and maintenance of mangrove nurseries, while men are more involved in physical work such as cutting bamboo, building and maintaining fences in the mangrove area, and decision-making. Currently, most mangrove restoration activities are still dominated by men.

Local Perspectives

Based on the research findings, it was observed that the people of Sepatin Village have a comprehensive understanding of the mangrove and its connection to the ecosystem. They can name several mangrove species such as Perangat, Api-api and nipah. They can also identify the

locations in their area with mangrove trees. Additionally, they can explain the various functions of mangrove forests, including their ecological, social, and other aspects.

Participants were also asked to explain why they consider mangrove forests valuable. Research findings showed that participants could effectively explain the various benefits derived from this ecosystem. To better understand how mangrove forests contribute to the daily lives of the Sepatin community, these benefits were categorized into seven aspects of life according to the Community Capitals Framework (CCF) theory initiated by Folkersen (2018), namely nature, financial, social, physical, cultural, and political. In this context, "aspects of life" refer to resources available to the community for maintaining their quality of life. This approach assists researchers in better understanding how mangrove forests support the lives of the Sepatin community. This approach is very community-focused, meaning that any actions taken must consider the needs and priorities of the involved community. These life capitals are interrelated, so some benefits may also be useful in other aspects of life.

Nature

According to Fey et al. (2006), natural capital is a fundamental starting point in the CCF, as ecosystems form the basis of community assets as the foundation of what the Sepatin community possesses. Natural capital emphasizes the importance of the physical environment and natural resources in influencing a community's resources. Natural capital is an integral part of the assets of the Sepatin community. The study's results indicate that the Sepatin community can effectively mention and understand the natural capital they possess. The community understands the mangrove forest's ability to prevent soil erosion and coastal erosion. Many of them explain that mangroves keep their land intact and prevent their homes from being inundated by high tides.

Furthermore, respondents can also explain the mangrove's role in supporting other fauna. They can explain that small fish and mud crabs use mangroves as their breeding grounds.

Financial

In this research, capital refers to the monetary resources available or wealth for community development (Emery and Flora, 2006). Respondents directly benefit from this ecosystem. For example, the research findings show that the Sepatin community relies on their catch for income. This catch includes crabs, fish, and other pond products. This catch is obtained from their ponds and their work as fishermen. Free fishermen are those who only go fishing in good weather.

Usually, free fishermen are men, while women often stay at home and engage in processing fish products such as shrimp paste and shrimp crackers. Shrimp paste is made from unsold shrimp waste. Instead of discarding it, they process shrimp waste into shrimp paste. This relatively simple processing makes many women in Sepatin involved in this activity and sometimes sell the products. The same applies to shrimp crackers. Handicraft products from shrimp have a high selling value if properly processed.

Physical Capital

Physical capital refers to basic infrastructure that communities need to earn a living, including buildings, housing, and transportation (Flora et al., 2005). In this research, it was found that the

community has knowledge of the laws governing mangrove ecosystems. They are aware that cutting down mangroves and using them as building materials is prohibited. Based on their beliefs, if someone cuts down one mangrove tree, they must replant ten mangrove trees. With this understanding, the community is very cautious about using mangrove trees. They only take parts of the mangrove tree that can be used without having to cut down the entire tree, such as branches to tie their boats to prevent them from being carried away by the currents.

Social Capital

Social capital encompasses the organization and networks within a community. These networks within the community promote a sense of ownership and connectivity among them (Jacobs, 2011). Research results indicate that during rehabilitation activities, the community spends time together. This occurs when women plant mangrove seedlings in polybags. They engage in this activity from morning until noon and continue in the afternoon.

During this activity, groups of women interact. They share information, news, and updates on various things, such as rising vegetable prices, the growth of their children, increasing temperatures, and gossip about the capital city's celebrities. They also exchange information about which areas to avoid in the mangrove forest.

This shows that the mangrove ecosystem has played a significant role in building social cohesion in the local community and contributes to social capital, in line with Queiroz et al.'s (2017) findings stating that mangrove forests can facilitate social interaction among individuals with shared interests and passions in preserving, nurturing, and restoring nature.

Cultural Capital

Cultural capital in this research includes values reflected in art, language, traditions, stories, and spirituality governing how the group functions in daily life (Fey et al., 2006; Jacobs, 2011). Mangrove wood is often used by the community to make crafts used in traditional ceremonies.

Another culturally important benefit is their contribution to preserving traditional ecological knowledge. This means that the community has passed down their knowledge of mangroves to the next generation. Typically, this knowledge is conveyed through simple stories to their children about the mangrove ecosystem. They also receive knowledge about mangroves through generational stories.

Political capital

According to (Fey et al., 2006), political capital denotes the community's capacity to access public resources or influence regulations governing their daily activities. In the context of mangrove ecosystems, the community acknowledges that mangrove forests are considered government property, a realization stemming from laws mandating permission for mangrove tree felling, particularly for commercial purposes. It is noteworthy that, as of 2013, International Union for Conservation of Nature (IUCN) regulations do not prohibit mangrove logging for subsistence needs.

However, the dynamics of decision-making reveal pronounced gender disparities in authority distribution between women and men. The researcher's observations indicate that decisions related to ecosystem management within the community are predominantly influenced by men.

An illustrative example of this gender imbalance is evident in the absence of women in the leadership roles of the Kelompok Tani Hutan (KTH), the Forest Farmer Group. The KTH's leadership comprises solely men, resulting in policy formulation primarily driven by male perspectives, with limited to no input from women. This gender imbalance raises concerns about the inclusivity of decision-making processes, as it sidelines the voices and contributions of women in shaping policies that directly impact the community and its interaction with mangrove ecosystems.

4 Conclusion

Within the conceptual framework of the Community Capitals Framework (CCF), mangrove ecosystems emerge as pivotal contributors to the well-being of the Sepatin community. These insights underscore the paramount importance of mangrove ecosystem rehabilitation for enhancing both the socio-cultural fabric and the livelihoods of the community members. Employing the CCF framework proves indispensable in deciphering local perspectives on ecosystem services and their profound impacts. This analytical tool enables a nuanced exploration of how ecosystems, specifically mangroves, contribute not only to financial capital but also to social capital within the community.

The research findings corroborate existing literature on gender roles within ecosystems, revealing distinctive patterns of interaction between women and men and their respective roles. Women, in particular, emerge as knowledge custodians of the mangrove forest, a role shaped by their active involvement in nurturing and preserving this critical ecosystem, often rooted in cultural traditions. This underscores the profound influence of gender dynamics on local knowledge and perspectives concerning ecosystems, a phenomenon amplified in communities like Sepatin that uphold deep-rooted traditions and values. In the context of Sepatin, where traditional gender roles persist, empowering women takes precedence in effective mangrove forest management.

The research brings to light the imperative of fostering inclusive, equitable, and sustainable environmental project management, with a keen focus on gender dynamics and intersectionality. Acknowledging and respecting gender roles, along with other intersecting factors, should be integral to the formulation and implementation of environmental policies. This emphasis is particularly critical in ensuring the longevity and success of environmental initiatives, as it aligns with the broader goal of cultivating a harmonious relationship between communities and their ecosystems.

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