Dynamics of Cultural Eco-feminism and Participation of Women in the Management of the Mangrove of the Mantehage Island, Indonesia

Ani Purwanti[1*], Dyah Wijaningsih[2], Muh. Afif Mahfud[3] & Aga Natalis[4]
[1,2,3,4]Faculty of Law, Universitas Diponegoro, Jalan dr. Antonius Suroyo, Tembalang, Semarang City, Central Java 50275, Indonesia.
[*]Email: anipurwantiundip21@gmail.com

Received	Accepted	Published
21.09.2023	29.01.2024	31.01.2024

https://doi.org/10.61275/ISVSej-2024-11-01-23

Abstract

Mangroves play a crucial role in the coastal ecosystem and the maintenance and protection of coastal communities. Managing mangroves on the Mantehage Island provides ecological and economic benefits, necessitating environmentally responsible management practices.

This research examines Mangrove Management in the Mantehage Island and emphasizes the crucial role of women in this process. It has investigated how integrating cultural eco-feminism concepts can lead to fairer mangrove management policies. The study focuses on the roles and functions of women in mangrove cultivation, considering gender roles and biological characteristics.

It employs a Socio-Legal approach to its methodology, utilizing interviews, observations, and examining legal documents associated with the issue for data collection.

The research findings indicate that the presence of mangroves significantly impacts coastal areas, including the Bunaken Island, considered one of Indonesia's coastal destinations. Maming Group is the most active in preserving and rehabilitating mangrove ecosystems. These findings reinforce various aspects of strengthening the cultural eco-feminist perspective, such as the central role of women, acknowledgement of the unique relationship between women and Nature, empowerment of local communities, implementation of new life laws by the Maming Group, importance of women's involvement in policy-making, and the connection between local culture and environmental protection. The findings contribute to formulating more inclusive and sustainable mangrove policies by encouraging women's participation in more effective roles, empowering local communities, and integrating cultural values.

Keywords: Mangrove management policy, Cultural eco-feminism, Women's participation, Mantehage Island.

Introduction

Indonesia passed the Law No. 7 of 2016 to protect and empower fishermen, fish cultivators, and salt farmers. These measures should assist Indonesian fisheries. It is useful because it protects the small fishermen by requiring the government to provide insurance in the event of a low harvest. Unfortunately, poor management, corrupt practices, and unnecessary and convoluted organizational procedures stymie the execution of this strategy. These things harm fishing villages, especially women fishermen. According to the introduction to Law Number 7 of 2016, in the "Protection and Empowerment of Fishermen, Fish Cultivators, and Salt Farmers," the state must ensure social justice for all Indonesians. The Law takes care of the fishermen, fish raisers and salt farmers who have helped the coastal and rural towns prosper economically (Purwanti et al., 2023).

Legislators recognize the potential of fishermen threatened by fuel oil, illicit fishing, overfishing, climate change, and weather changes. Disease, pollution, broodstock, seeds, and cheap feed endanger fish farms. Invariably, the fishing families are directly affected by these issues. The initial intention to place Law Number 7 of 2016 on the protection and empowerment of fishermen, fish cultivators, and salt farmers is crucial for their protection and empowerment. Early research has found a gender bias in this rule about tiny fishing households(Purwanti et al., 2022).

Mangroves in the Mantehage Island are a sustainable natural treasure. Beautiful mangroves and massive coral reefs surround the island. Astonishingly, Mantehage Island's mangrove ecology contains twenty species. Tis is equivalent to 74% of the total at the Bunaken National Park. Two endangered mangrove species also exist: Camptostemon philippinense (Vidal) Becc and Sonneratia ovata Blake, which is the focus of the main conservation objective (Djamaluddin & Djabar, 2022).

Research on biological aspects, island construction, and community management of the Mantehage environment are thus needed. Bunaken National Park field workers point out that most of the Mantehage Island is community plantations. Due to indigenous animals, including tarsiers, Sulawesi bear cuscus, Timor deer, and many beautiful bird species, the island offers a unique experience (Sormin et al., 2015).

Its mangrove ecosystem supports the environment and economy. Hence, it must be managed responsibly. Indeed, the Mantehage Mangrove Park is an ecological and special interest tourism destination that enhances the environment. The 1,200-meter Mangrove Trail lets travellers see the mangrove vegetation and blue water. The Information Centre and Research Building adds to the location's appeal. Despite these, the Mantehage Island has no hotels. However, people's cottages offer an authentic lodging experience with all the attractions of the island. Guests talk to the locals while eating regional delicacies.

During the early observations, the research team met Mun Djenaan, a Swara Parampuang NGO activist from Manado City. As an environmentally conscious woman, Djenaan was the first to strive to save the mangrove forest by involving women. Djenaan advised Mantehage Island women to form a network of mangrove managers to preserve the forest. This was due to her concern for the mangroves and the impoverished condition of the women.

Males initially thought their efforts were pointless and showed contempt. This was because patriarchal views rule the island. Djenaan continued the activity because she believed it improved women's lives and the mangrove forest. The community knowledge, environmental consciousness and understanding of the mangrove forest grew over time. The idea that women can lead public policymaking also emerged. This has sparked an interest in the possibility of the leadership of women in the management of the ecosystem.

Religious and political viewpoints have dominated research on women's leadership until now. Nevertheless, environmental leadership of women is widely recognized as a key part of environmental conservation and needs more attention.

This research is thus focused on the leadership of women in the management of the mangrove. It is based on the idea that environmental exploitation will harm women. It is argued that since their gender roles depend on Nature, environmental devastation will affect women.

Indeed, they will find it harder to find firewood for cooking if the Mangrove diminishes. Given their experiences, women should be involved in environmental management policy, especially mangrove management.

This research is based on the premise tht cultural eco-feminism or the environmental involvement of women is a significant force to reckon with. It thus examines the close relationship between women and Nature through cultural eco-feminism, taking into account gender roles and biology of the women. Cultural eco-feminist experts believe that their participation in natural activities raises their awareness of the purity of the environment and devastation. Indeed, cultural eco-feminism and religion share the belief in Nature-based goddesses to redeem the spirituality of Nature and the position of women as key figures (Natalis et al., 2023a). This study aims to propagate the idea that the society should value this sensitivity to better understand the natural world in which people live. The objectives of this research are:

1. To identify the systems of Mangrove Management in the Mantehage Island.
2. To ascertain the vital role of women in Mangrove Management in the Mantehage Island.
3. To ascertain the crucial role of women in shaping the fair Mangrove Management policies based on cultural eco-feminism as a concept.

Theoretical Framework

Mangrove Management

A "mangrove" is a tropical tree found solely in intertidal communities. Morphological and ecophysiological traits make mangrove trees structurally and functionally remarkable. Mangrove forests often have larger standing crops than other water habitats. In addition to breeding and nursery sites for marine and estuarine species, mangroves cycle nutrients, export nutrients, trap silt, and protect coastal communities. Mangrove habitats have produced firewood, charcoal, construction timber, fish traps, tanning chemicals, dyes, and medicines for millennia (Duke, 2011; Duke & Schmitt, 2014).

Mangroves are vital to coastal ecosystems and communities. As a cost-effective disaster risk management strategy, they reduce coastal erosion, storms, and flooding. They also reduce floods (Menéndez et al., 2020; Sunkur et al., 2023). Young marine species finds food and safety in mangroves before venturing out or colonizing coral reefs. They also support hundreds of bird species. They safeguard marine life and provide breeding and migratory habitats for birds (Sandilyan & Kathiresan, 2012).

Climate regulations rely on carbon sequestration of mangroves (Alongi, 2018). Unlike terrestrial forests, mangroves store carbon in their root systems and soil, as well as in their trunks and branches (Ray et al., 2011). As carbon "sinks," they store it for future generations. Unlike terrestrial forests, they have a decreased danger of fire and carbon loss, making them a safe long-term carbon "investment" (Kirschbaum, 2003). Ecotourism and fishing provide coastal communities with economic opportunities from mangroves (Sadeer & Mahomoodally, 2022). Fish, shellfish, and other food supplies from them help local communities stay fed. Thus, mangrove environments are ecologically and economically important. They encompass 15,000,000 ha2 and have high biomass and commercial value. At the border between land and sea, these woodlands supply food, breeding grounds, and nursery sites for many marine and terrestrial organisms, including commercial species and juvenile reefs. Mangrove forests are highly productive ecosystems with primary production rates comparable to tropical wet evergreen forests. Most of the carbon in tree biomass is lost through decomposition and transported to nearby ecosystems (Carugati et al., 2018). State policies can affect their growth and sustenance.

Policy is a subfield of applied social science that uses various research methods and arguments to develop and communicate decision-making knowledge (Dunn, 2008). Political level policies address public concerns with this knowledge. Published mangrove ecosystem management regulations in Indonesia include Regulation No. 73 of 2012 of the President of the Republic of Indonesia on the National Strategy for Mangrove Ecosystem Management, Law No. 5 of 1967 on Basic Provisions of Forestry, Law No. 9 of 1985 on Fisheries, Law No. 5 of

1990 on Conservation of Biological Resources and Ecosystems, Law No. 41 of 1999 on Forestry, law No.

Septory (2014) examines coastal forest jurisdictional concerns under forestry legislation. Article 4, paragraph 1 of Law No. 41 of 1999 states, “Forest ownership includes all forests within the territory of the Republic of Indonesia, including natural resources contained therein, controlled by the State for the greatest prosperity of the people.” The law includes this. The inclusion of “all forests” and “including natural resources contained therein” means Law No. 41 of 1999 covers mangrove forests and their resources. This is because mangroves are forests. Another description of mangrove forests is tropical woods near the coast or in tide-influenced estuaries. The Ministry of Forestry's power to manage mangrove forests and land areas Article 4 paragraph (2) of Law No. 41 of 1999 grants the Ministry of Forestry authority to regulate and manage forests, forest areas, and forest products, determine certain statuses as forest or non-forest areas, regulate legal relationships between people and forests, and regulate forestry legal changes. One of the Ministry of Forestry's powers is to conserve mangrove forests.

The Role of Women in Mangrove Management

Even though women play a significant part in the utilization and administration of natural resources, they are frequently barred from participating in decision-making regarding these resources due to various impediments, including social, cultural, and other factors (DasGupta & Shaw, 2017). Fishermen collect fish, while women clean them for domestic use or sale. Thus, women fish workers need extra consideration. According to Anna (2012), domestic workers sometimes are unpaid. Even if they catch fish, they are simply fishing with their husbands. Fitriana and Stacey (2012) say the concept of fisherman excludes women. Female fish workers are overlooked, which hurts them because they need government funding, processing technology, cold storage facilities, and training.

This problem shows that despite official efforts to support small-scale aquaculture communities, women fish workers are left behind or believe they need support. According to recent research (Weeratunge et al., 2010), women's role in aquaculture has grown to unprecedented levels. Harper et al. (2013) show that 42% of Indonesian aquaculture village workers are women. This is over half the secondary farming workforce, including pre- and post-harvest operations. Women's participation in political and economic organizations includes both processes and results. They participate in bureaucracy, policymaking, and representative groups (Aspinall et al., 2021).

According to the UN, women and men must be equally represented in decision-making positions and actively participate in community-based forestry. Several international frameworks, like the Sustainable Development Goals, emphasize women's engagement and gender-based rainforest conservation (Purwanti et al., 2023). Women acquire resources for mangrove forest maintenance. Firewood, fish, and nipa leaves are collected and processed. Attending and contributing to meetings or holding official positions in forest committees allows women to access natural resources, acquire skills, learn about forest biodiversity, participate in forest management, and influence policy. Participation of local people, particularly women, in collaborative forest management has solved sustainable forest resource management problems and has also improved livelihoods. Women's participation in forest resource management can promote governance by encouraging rule compliance, reducing rule infractions, and promoting sustainable forest use and management. This improves livelihoods and opportunities (Mwangi et al., 2011).

It is undenoable that collaborative forest management, conservation and rural women's empowerment (independence, economic empowerment, and decision-making capacity) can improve rural communities' quality of life. Women's participation in collaborative forest management improves forest conservation and rule compliance. Women also improve forest conditions by knowing plant types and resource extraction methods (Agarwal, 2009).

Cultural Eco-feminism

Eco-feminism, a fusion of feminism and ecology, holds that patriarchy and capitalism create women's slavery and environmental degradation. It also stresses that women's equality should not harm the environment and that environmental progress should not harm women. Methods that address one must consider their impact on the other. Eco-feminism promotes cooperative and compassionate behaviours over hostile ones to benefit society and the environment (Natalis et al., 2023a).

Several methods have been used to study the relationship between environment and women. Eco-feminism first praised women's stronger links with Nature and offered 'the feminine principle' as a cure to environmental destruction. However, this essentialist concept has been critiqued for idealising women as earth mothers or gods and claiming community elitism. Eco-feminism was accepted at the 1992 UN Conference on Environment and Development (Buckingham, 2004). This meeting recognized the link between environmental and women's rights. In the 21st century, ecofeminist citizenship, critiques, and feminist themes in environmental justice and political ecology have revived debates. In contrast, eco-feminism production dropped in the late 1990s (Yee-Man Lam, 2017).

Cultural feminism, an eco-feminism, has long reclaimed women-Nature relations as liberating representations of care skills of women on Nature. Many cultural eco-feminists support pre-patriarchal faiths and spiritual practices. Their emphasis on women's special connection to the physical world can help stop the unfair dominance of either women or the environment (Warren, 2001).

Review of Literature

A substantial amount of research has been conducted on women's roles in mangrove management. Scholars such as Bosold (2012) have brought attention to the recent incorporation of gender into the discourse around mangrove conservation. However, there is still a lack of actual implementation of gender mainstreaming in mangrove conservation management, which indicates that additional research is required. According to Pratisti et al. (2012), the level of participation of women in mangrove conservation is impacted by various factors, including their self-perception, their social position, and the attitudes of the community towards female participation. Even though women play important roles, notably in nurseries, they are frequently excluded from decision-making processes and profit-sharing arrangements. One of the most critical steps toward attaining gender equality in mangrove conservation cycles is to increase women's negotiating power and encourage their participation in management groups.

These observations from Pacific Island nations, provided by Pearson et al. (2019), highlight the critical ecosystem services mangroves provide to local populations. Women are frequently the primary caretakers of these forests, and they stress their importance. Within the context of Fiji, gendered attitudes and interactions with mangrove ecosystems are shown by exploring native viewpoints through home interviews. Consequently, incorporation of gender into ecosystem service management interventions is encouraged to ensure sustainable and equitable outcomes, as the research conducted by Pearson emphasizes.

Nguyen & Dang, (2018) greatly emphasizes the good grasp of mangrove responsibilities of women; nonetheless, their contributions are frequently disregarded in management processes, which diminishes the overall capacity of the community. To overcome these discrepancies, it is proposed that solutions be developed by developing community-based mangrove protection measures. These solutions include boosting civil society and women's engagement. Similarly, Cañada et al. (2022) acknowledge the participation of both the males and the females in the exploitation and management of mangroves, recognizing that they have various roles and problems in this endeavor. Although certain variations exist between the sexes, men and women contribute substantially to mangrove-related duties. This highlights the significance of inclusive methods in the management of mangroves in a sustainable manner.

Research Methods

This research takes a socio-legal approach to investigate this topic. The study problem focuses on the role and function of women in mangrove cultivation on Mantehage Island to understand their viewpoints on the conservation and usage of mangroves. An approach that combines socio-legal analysis with analytical descriptive analysis is utilized in this study. A normative legal analysis of Indonesian laws and regulations is included in the legal approach. More precisely, Law Number 7 of 2016 is the law that pertains to the protection and empowerment of fishermen, fish cultivators, and salt farmers. This analysis aims to determine whether or not this law provides enough support for female fish workers through various policies, hence offering protection and empowerment in the fishing business's social, legal, and economic elements.

There are both primary and secondary sources of information utilized in this investigation. Primary data is collected through field research, interviews and observations with relevant people. Three sources provide secondary data: primary legal materials, which include laws, regulations, and case law; secondary legal materials, which include legal reviews, journals, guidelines, and legal opinions; and tertiary legal materials, which include dictionaries, encyclopedias, websites, and other similar resources.

Purposive and snowball sampling are utilized in the sample determination process. In addition to other stakeholders, the key data sources include village officers, fishermen, mangrove farmers, traders in mangrove areas, members of the women's mangrove organization, and other individuals. As part of the primary data collection process, interviews are conducted with respondents, resource persons, and informal sources of information.

The analysis entails doing a thorough investigation of the data gathered, with a particular emphasis on the legal elements associated with the cultivation of mangroves on Mantehage Island. A normative legal analysis is conducted to investigate whether or not the rules and regulations now in place are compatible with the realities that women active in mangrove agriculture confront.

Findings

Exploring Mangrove Management on Mantehage Island

A huge mangrove forest that spans 1,340.92 hectares are found in the Mantehage Island, located within the massive Bunaken National Park. Three tracking routes exist at Desa Tinongko, Desa Buhias, and Desa Bango, all located within the mangrove park that spans over 1,200 meters. Rhizophora spp, Sonneratia alba, Bruguiera spp, Avicennia marina, and Ceriops tagal are some of the diverse mangrove species on Mantehage. However, Rhizophora spp are particularly abundant on the island (Djamaluddin & Djabar, 2022).

When preserving coastal areas from erosion and filtering organic and chemical pollutants, mangrove trees play a significant role. This helps to ensure that coral reefs and seagrass beds remain clean. As an additional benefit, these ecosystems provide nurseries for fish and shrimp and habitats for a wide variety of crustaceans, reptiles, and even crocodiles that live in estuaries. Mangrove ecosystems provide a haven and nesting grounds for various birds, including those that live in swamps, seabirds, and fruit bats.

Because of the low oxygen levels in salty sediments, mangroves develop roots mostly above ground, enabling them to absorb oxygen directly from the air. This contrasts terrestrial trees, which take in oxygen through their roots rather than through their roots. In addition, mangrove leaves play a part in regulating salt levels thanks to their ability to remove and eliminate salt from the roots of the mangrove until the leaves shed.

There are two distinct land sections on Mantehage Island, and a layer of mangrove vegetation is between them. In contrast to the typical conditions, this mangrove habitat is intrinsically unstable and regularly subject to environmental stresses. Despite this, the mangrove ecosystem in Mantehage is home to a wide variety of mangrove species, some of which have yet to be discovered in other parts of Bunaken National Park. Concerns have been raised about recent incidents on the island during which many mangroves have died, notably between the two land regions. In contrast to the mangrove fatalities that occurred in the past

during extended droughts in 1970 and 1982, the current mangrove deaths occur under rather typical weather conditions. This suggests that other causes, such as changes in land use and hydrological disruptions, contribute to the situation.

Following major discoveries were identified as a result of observations made on December 7, 2012:

1. Primary mangrove species, including B. cylindrica, L. racemosa, and A. marina, exhibited mass deaths around the lagoon between Mantehage's two land masses.
2. The primary cause of mangrove deaths is repeated stress due to changing land conditions.
3. The construction of a permanent bridge has affected land hydrology and sedimentation.

The book “Lessons From the 21st Century” by Yuval Noah Harari (2018) emphasizes that climate change is a serious worldwide concern, and deforestation is a substantial contributor to this problem. According to the Food and Agriculture Organization, deforestation worldwide is reducing, yet Indonesia, notably Mantehage Island, continues to face issues. Concerns about the environment are brought to light on a global and local scale by deforestation, which includes the destruction of mangrove forests.

According to the most recent information from the Ministry of Forestry, about 637,624.31 hectares, or 19.6% of Indonesia's mangrove area, is in a catastrophic condition. Indonesia has contributed to the loss and degradation of mangroves in Southeast Asia. Between 1996 and 2016, Indonesia was responsible for forty per cent of the global losses and sixty per cent of the deterioration. The current rate of deforestation threatens the entire planet's biodiversity despite Indonesia being home to twenty-five per cent of the world's mangroves.

Mantehage Island, located in North Sulawesi and an important mangrove area, requires the attention of all parties' attention, including the government and the populations that live there. The island is a buffer for Bunaken Island's natural resources and wildlife. As a result of the decline of mangroves on Mantehage Island, the fauna and flora of Bunaken are directly impacted, which in turn affects the overall health and attractiveness of the ecosystem.

The Mantehage Mangroves face the following obstacles and dangers: Mantehage Island is susceptible to various difficulties due to its important strategic position. It has been observed that the demise of mangroves is attributable not only to natural forces but also to artificial stresses, such as the changes in land use and construction projects. The interdependence of the mangrove ecology in Mantehage with that of Bunaken National Park highlights the critical nature of tackling these concerns to the greatest extent possible.

Given that Indonesia accounts for a sizeable portion of the world's mangrove cover, the ongoing deforestation of mangroves in the country has worldwide repercussions. Livelihoods of the coastal populations, climate regulation, and biodiversity are negatively impacted when mangroves are cut down. It is abundantly clear that there is a requirement for sustainable mangrove management and restoration in order to lessen the effects of climate change and to promote biodiversity at a global scale.

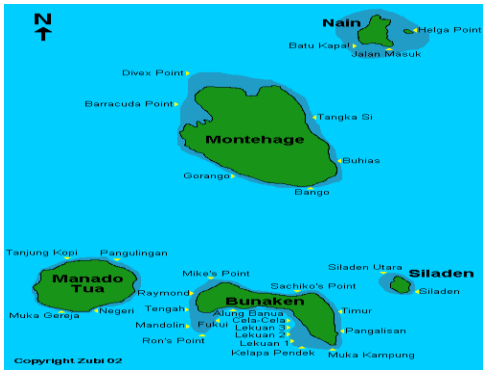

Fig. 1: Map of Bunaken National Park and Its Dive Sites
Source: Teresa Zubi, available at https://www.starfish.ch/dive/Bunaken.html

Due to unfortunate circumstances, the number of mangrove areas in Mantehage and their width are gradually decreasing. In his research, Rignolda Djamaluddin discovered that the central zone of Mantehage Island was where a significant amount of mangrove dieback was claimed to have occurred. The condition known as dieback is one factor contributing to deforestation. When a stand of trees begins to lose their health and eventually die without any discernible reason, this occurrence is called forest dieback. Additionally, this phenomenon is referred to as forest decline, forest damage, canopy level dieback, and stand level dieback within the forest. Trees of a single species are typically affected by this, although it is also possible for numerous species to be affected. The western and northern parts of Mantehage Island were where the dieback event occurred. According to Djamaluddin & Djabar (2022), the dieback phenomena will threaten the existence of mangroves on Mantehage Island.

As a result of the significant role that mangroves play in preventing erosion in coastal areas, the high level of mangrove degradation that occurs on Mantehage Island has the potential to have a severe influence on the coastal area, which includes Bunaken, which is considered to be one of the coastal destination areas in Indonesia. since of this, coastal land can be protected from erosion since it can serve as a barrier against waves, which pose a threat to the existence of coastal land. Forty per cent of the land along Indonesia's 81,000 kilometres of coastline has been harmed due to abrasion. It is equivalent to 30,000 square kilometres of land on the Indonesian coast. If abrasion took place, the width of the land in Indonesia would decrease. Another impact that may occur is that coastal erosion can affect the degree of soil salt in the land, which can lead to various diseases, including skin diseases, kidney dysfunction, and digestive diseases.

One more effect of the degradation of mangroves is that it reduces the amount of food that other types of biota on the coast receive, as mangroves are the source of this food for them. This will result in the extinction of those biota. This will also directly impact human existence since mangroves supply wood, which can be used as a raw material in the construction of buildings and as firewood for cooking. In addition to being a source of food and medicine, it is also a commodity for the pulp industry. The excessive emission of greenhouse gases is another influence that can affect the ecosystem, including climate change. Much of the carbon in mangrove forests is stored underground, making them among the most carbon-rich ecosystems.

Since the Indonesian government can only mend 250 kilometres due to a lack of staff and financial constraints, it is imperative that all stakeholders, including women, be involved in addressing the high deforestation of mangrove areas and the several repercussions that come with it. A regulation known as the Government Regulation on Disaster Mitigation in Coastal Areas (abbreviated as DMCA) has been issued by the official government of Indonesia. By this rule, coastal vegetation can contribute to mitigating sea level rise, tsunamis, erosion, and storm formation. In order to find a solution to this problem, it is necessary to involve a large number of parties, including women. Given that mangroves are found in coastal waters and that the majority of people living in Indonesia's coastal areas are impoverished, we must prioritise women's participation in mangrove exploitation and preservation. During her research, Ratna Indrawasih discovered that gender inequality is still present in coastal societies; these individuals continue to be excluded and require any form of empowerment. According to the findings of her investigation into Demak, she discovered that legal culture is also a factor in gender discrimination. She concluded that despite many women having the same amount of duty and load, they need to be on equal footing. One last thing to consider is that there are numerous gender-based rules.

Women and their Vital Role in Mangrove Management on Mantehage Island

According to the information provided by the People's Coalition for Justice for Women, there are 12.827 coastal villages in Indonesia. 8.1 million families live in these villages. The majority of people who live along the shore are poor, and they are responsible for twenty-five per cent of the total number of people living in poverty in Indonesia. Under these circumstances, the level of prejudice and inequality between the sexes in that community is still rather high. When poverty is higher in a certain region, gender disparity is also higher. This

indicates that the higher the level of poverty in coastal areas, the greater the power of gender in those areas. The potential for gender disparity in the coastal area, including managing mangroves, is significant in this particular instance. However, the Indonesian government's regulation on mitigation in coastal areas has not emphasised gender equality or even gender neutrality on the issue. It is still the case that the regulations in Indonesia regarding coastal areas are gender-neutral; nonetheless, the Fisherman Empowerment Act is discriminatory against women because it prevents them from obtaining a variety of subsidies and services. Because of this, the number of opportunities available to women in mangrove plantations and management is still quite limited. A woman's role is limited to a subordinate and supporting partner to her husband. When a person is in such a position, the decision-making process is carried out by men, and women are not allowed to decide or have any impact. In light of this, gender inequality continues to be a problem.

There is no mention of women's rights to land and forest resources in any national laws and regulations pertinent to the usage and management of mangroves. Similarly, the policies that govern the local village are made without regard to gender; gender equality is presumed rather than actively sought. Local social norms, founded on gender roles and the activities that men and women can conduct effectively by broader social standards, are the foundation upon which community-level practices are built. Training on alternative items for market sales that can be obtained from mangrove leaves, barks, and fruits through processing procedures has been provided to women by non-governmental organizations (NGOs). In addition to being excluded from the decision-making process entirely, women are confined to low-skilled occupations throughout the world. Because women are not included in decision-making processes and structures, they have a lower level of awareness than males regarding the regulations and programs that are now in place for managing mangrove ecosystems.

The presence of mangroves significantly impacts the lives and livelihoods of the residents of Mantehage. Before the construction of aquaculture ponds in the year 33, the mangrove woods were the most prominent aspect of the atoll's scenery. The Bunaken National Park Management Advisory Board, the Woman Empowerment Non-Governmental Organization known as Suara Parampuang, and the woman group at Mantehage Island have all realized that the Mangrove Forestry Area is of great significance. Both the preservation of the mangrove forest in Mantehage and the improvement of the economic situation of women in that region are the goals of this organization, which has two distinct objectives. Through the use of the following diagram, one can gain an understanding of the relationship between the parties:

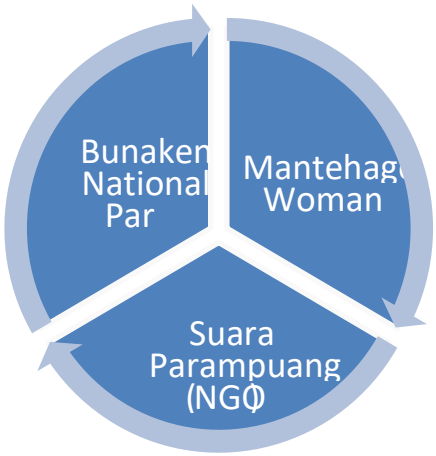

Fig 2: Relationship between Mangrove Preservation and Women's Economic Empowerment in Mantehage Island
Source: Author

The Bunaken National Park Management has a significant interest in preserving the Mangrove Area in the Mantehage Area as a buffering area for Bunaken Island, a popular tourist destination, particularly for diving and other types of tourism activities. Mantehage is strategically positioned to preserve the flora and fauna found in the Bunaken Area's underwater environment. This is because this mangrove is the location of fish hatcheries. In order to preserve this, it is essential to raise people's awareness not only to prevent the chopping down of mangrove trees but also to ensure that they take part in the planting of mangrove trees, the maintenance of mangrove areas, and even the development of mangrove areas. Within the context of such a goal, the female population becomes a significant and strategic target.

In a different region, there is a non-governmental organization known as Suara Parampuang that is actively participating in the process of empowering women in the Bunaken Island Area, which includes Mantehage. This organization collaborates actively with the government, including Bunaken National Park Management, to preserve the community located in the Bunaken Area, which includes the Mantehage community. Mangrove preservation and economic empowerment are the primary concerns of this region's non-governmental organization (NGO). Since 1998, this non-governmental organization has provided women with direction and empowerment. The women of Mantehage have been empowered by this non-governmental organization (NGO) for twelve years until they can eventually achieve independence and take care of all things, including the maintenance and care of the mangroves on their own.

When it comes to anything, the Woman Group on Mantehage Island is the most significant component. Maming is the name of this group. The organizational structure of this is characterized by Volla serving as the group's leader. NGO Suara Parampuang has been assisting the women's group on this island. This group is distinguished by the fact that it assists women in sustaining themselves through producing banana snacks, producing charcoal from coconut shells, and, finally, preserving the mangrove environment. It is clear from these activities that this group is highly powerful since it is not only concerned with issues of social and environmental interest but also with issues of commercial interest. When it comes to economic matters, they are dependent on one another because it affects the income that their family receives. As a result of the fact that they share several economic interests, it is to their collective advantage to have the same production instrument. Furthermore, this group is essential for the social cohesion of the individual members of the population. The social relations are reflected in this category.

In terms of environmental activities, this Maming tribe is fully aware that mangroves have a significant and significant impact on the people, particularly in preventing the abrasion caused by seawater and defending Manthage Island. Even if there are no mangroves, the abrasion will still occur, which will be detrimental to society. Taking this into consideration, this Maming group began planting the mangroves in the year 2007. Suara Perempuang, the Indonesian Program of the Wildlife Conservation Society, and Mitra Pesisir are the organizations that steer this group through planting mangrove trees.

Bunaken National Park Management is also responsible for coordinating and supporting this program. Regarding this particular scenario, the woman can search for and gather the seed, and the Bunaken National Park Management will subsequently purchase the seed she has collected. This indicates that the women's organization can earn money by planting seeds. Because of this, the lady group can give their full soul to seeding and safeguarding the mangrove. The group needs help with the climate, which is not favourable for the woman to plant the seed. This is the dilemma that they are running into.

Additionally, the woman is involved in the stage of execution, which is that of planting the seed. At this point, the group decides who will be responsible for planting the seed and the coordinator. When it comes to participating in this activity, the Maming group also receives support from the husband, and the spouse has no complaints. Recently, the heat wave caused by El Nino has become a barrier to planting the seed. Additionally, the Maming group is responsible for monitoring the expansion of mangroves as part of their oversight procedures.

According to the supervision, there are a significant number of mangrove trees that are experiencing death as a result of the weather.

The Maming Group has established several innovative strategies, one of which is the imposition of sanctions on individuals who cut down mangrove trees without first obtaining permission. When such a breach occurs, the person responsible must plant ten new trees as restitution. If the person who committed the offence does not fulfil that requirement, he will be reported to the police officer and the management of Bunaken National Park.

Being aware of this fact brings to our attention that Maming Group has developed a new living law. The law originates from the society and is necessary for the society. The statement made by Eugen Ehrlich (2017) that the centre gravity of law does not lay in legal propositions created by the state but rather in laws created by society, also known as the living law, is brought to our attention by this phenomenon.

Table 1: Contribution of the Maming Group to Mangrove Preservation in Mantehage Island

Indicator	Explanation
Planning	Making the Structure of organisation Looking for the seed and coordinating with Bunaken National Park Management
Implementation	Determining responsible person in planting the seed to coordinate the member
Supervision	Doing surveillance over the growth of mangrove
Sanction	Every person who cut the mangrove tree must plant 10 new trees

Previous table has shown that the Maming Group has contributed a lot in maintaining and protecting the Mangrove in Mantehage Island. The contribution lies in planning, implementation, evaluation and sanction. Higher the role of woman in Mantehage, the higher the Mangrove grown healthily.

Discussion

The strategy of developing coastal areas as mangrove habitats that have been implemented up until this point has frequently tended to be partial and adheres to a “top-down” approach. This method often fails to reflect the interests and requirements of local communities, and it does not follow a "bottom-up" approach (van Oudenhoven et al., 2015). In its implementation, it fails to make the best use of the potentials already present, such as the wisdom or values of the local community. The methods of conservation of mangrove natural resources should not, in any way, marginalize local populations; rather, they should provide local communities with access to the distribution of benefits, both directly and indirectly, to improve the well-being of the community. Multi-use management will bring about a wide variety of activities, providing local populations with greater opportunities to participate in managing mangrove forests. Participation from the community is a collaborative effort between planning and the community in planning, preserving, and developing the outcomes of development that have been achieved. In addition, it is important to recognize that community-based management focuses more on altering attitudes and orientations, institutional and administrative procedures, and management methods of mangrove resource management. The management of the ecology of the mangrove forest with the participation of the community is a dynamic and sustainable process that integrates a variety of interests, including those of the government and the community, science and management, as well as the interests of the general public and specific sectors. In this context, community-based management refers to utilizing the primary resource, understood as the community, as an actor in managing those resources. Participation from the community is essential for the management of resources in a sustainable

manner, and in general, different community groups will have diverse interests in the resources in question. With the participation of all relevant stakeholders, resource management will be successful (Zakiyah et al., 2023).

When it comes to managing mangrove forests, one of the most intriguing difficulties is related to the harm done to the ecosystem of mangroves, which continues to be an issue that involves considerable environmental concerns. The reason for this is that there is an imbalance in the ecology. In general, the degradation of mangrove forests is not only driven by natural forces; human involvement is also a contributing component. One of the consequences of the degradation of mangrove forests is the loss of coastal protection from wind, high sea currents, and waves. Additionally, there is a risk that the regeneration of fish and shrimp in offshore seas will be hindered. On the other hand, mangrove trees naturally act as a barrier along the coast, protecting against floods and ocean waves (Montgomery et al., 2022).

Researchers have discovered that women are the demographic that is most negatively impacted by the destruction of mangrove forests as a result of shrimp farming (Treviño & Murillo-Sandoval, 2021). The construction of large-scale fisheries has resulted in the collapse of traditional livelihoods of local populations. As a result, men have been forced to penetrate the mangrove forest in order to collect shells, which was an activity that women primarily carried out before this shift in industrialization. Women have been virtually evicted from the mangrove forest as a result of the shift in men's livelihoods, which has resulted in them losing their autonomy, economic independence, and the capacity to carry on cultural traditions within their communities. Furthermore, the introduction of shrimp aquaculture increases the local dependence on mangrove resources, which in turn leads to a drop in the population of mangrove clams and places both men and women in situations of vulnerability.

According to scientists working in the field, the development of shrimp sustainably involves more than just effective harvesting procedures (Dang, 2020). Environmentally mindful and social are two qualities that it must possess. Within the context of industrial development, certain studies shed light on the intricate socio-cultural and gender structures in locations where resources are depleted, highlighting the significance of considering these structures. Furthermore, these studies demonstrate how local communities can identify concerns that have been missed and provide insights into complicated environmental challenges. In order to achieve a more inclusive approach in both business and research, the scientific community and the business sector need to incorporate local knowledge and understand a community's social structure.

French readers knew Françoise d'Eaubonne (1974) from her poetry, biographies, science-fiction novels, and philosophical articles in the 1970s and 1980s. In the anglophone North, she was famous for coining the phrase “ecofeminism,” which she first used in the concluding paragraphs of her books Le Féminisme ou la mort/Feminism or Death. Ecofeminism links “nature” and “woman” naturally. The main claim is that “belittling nature” and “belittling women” are historical isomorphs. Ecofeminists focus on “nature” because they want to change the relationship between man and nature by examining the source of the conflict to liberate nature and women. Ecofeminists argue that “female principles” may solve humanity’s ecological crisis. Ecofeminism sparked a green revolution. The oppression of women and other forms of oppression rooted in man's attempts to dominate nature are shown. To end patriarchal inequality, it fights for women's equal social authority and for men and women to cooperate and develop together. Ecofeminism promotes cultural harmony and ecology. Its activists want cultural ecology and environmental equality for men and women. They achieve social equality, human rights, and women's reasonable status and legal rights in personality and culture (Allison, 2017).

Cultural ecofeminists believe women’s biological and cultural differences from men explain their personal and spiritual connections to nature. They lead the ecofeminist movement, which has been seen as a powerful response to the mutual relationship and devaluation of women and nature, especially in Western culture, since its early 1970s founding. They claim that women’s physiology, societal roles, and psychology have made them more like nature (Allison, 2017). According to Merchant (1983), Women experience the pleasures, anguish, and

stigmas of menstruation, pregnancy, childbirth, and nursing, while males can travel, hunt, fight, and participate in public affairs. Childrearing and housework have kept married women at home and out of work. Women are seen to be more emotional and connected to the present than males, who are more intellectual and abstract.

Cultural feminists blame patriarchal culture and economic and political systems for environmental deterioration and argue that women's natural experiences inform environmental policy. Therefore, they urge active social action to create new exchange and governance systems that respect women and nature more (Allison, 2017).

Cultural ecofeminists distinguish women from males based on their deeper relationship to nature and dispute men's dominance over women and nature. They claim that dualism, or "relation of separation and domination" (Plumwood, 2002).

involves an unjustified value hierarchy that prioritizes subject/mind/reason over object/body/emotion (Shiva et al., 2014). Some embrace and valorize women, and all that is culturally feminine, from their biological ability to produce children to their socialization as caretakers to their relationship-oriented mindset. Cultural ecofeminists use Neolithic European archaeological evidence to claim that prehistoric agrarian cultures were peaceful and worshipped goddesses (Gimbutas, 1974). They attribute patriarchy and the cultural and religious demonization of women to Eurasian tribe invasion, population growth, highly diversified economies, and more complex governance systems. Thus, their positive reevaluation of traditional linkages between women's biology and major reproductive function in society supports personal empowerment, collective identity, and environmental action.

Cultural feminism has greatly influenced women's ecological concerns and social activism. Sturgeon (2016) specify that their environmentalism is driven by women's identification with their roles as (prospective) life-givers, in contrast to men's support for guns and other damaging technology. Cultural ecofeminism easily explains women's hostility to nuclear weapons, war, chemical-dependent factory farming, and hazardous waste disposal. This ecofeminism has been criticized from the outset for being essentialist in terms of biological determinism and universalism.

Despite the critiques, cultural ecofeminists maintain that a recognition of women's distinctive relationship with nature is essential for understanding and addressing environmental issues. They argue that women's unique experiences and perspectives can contribute significantly to the development of more sustainable and equitable environmental policies. By challenging traditional notions of dominance and control over nature, cultural ecofeminism advocates for a more holistic and interconnected approach to environmental problem-solving.

Ecofeminism emphasizes the development of human-environment relationships centered on values of care, compassion, and non-violence (satyagraha). The concept of earth-based spirituality found in the Toba Batak society is inseparable from the understanding of Dalihan Na Tolu and Porhalaan, which form kinship relations, beliefs, and tribal narratives among the Toba Batak community. In the Indigenous Benuaq Dayak Society, there is the concept of Umaq, Simpuk, Bengkak, which represents conservation behaviors developed by the Benuaq Dayak community. Customary regulations play a controlling role in the sustainable ecological behavior system in forest management. The concept of "sedulur sikep" with the pattern of "sikep rabi" is a formulation stating that no individual plays a dominant position in society. There is no separate self, but always "sikep rabi," relationships, and ties. The community relies on nature, and nature relies on humans, which, in turn, follow the pattern of "sikep rabi." The Besipae Indigenous Community regards nature as a home that must be cared for and not harmed. In Toraja life, the universe is represented by "tongkonan" as a tangible depiction of the macrocosmos. "Tongkonan" serves as the center of social life for the Toraja people, where various forms of activities and social relationships are organized. "Tongkonan" is not just a residence but also a meeting place with relatives, ancestors, and gods (Natalis et al., 2023b).

Climate change poses a serious challenge to the world today, with impacts including global temperature rise, changes in extreme weather patterns, rising sea levels, and loss of biodiversity. In this context, mangroves play a crucial role in mitigating climate change.

Based on the experience in Mantehage through the analysis of cultural ecofeminism, any policy related to the protection and management of mangroves should be based on a collaborative approach, evolving into what is known as Collaborative Mangrove Governance. Key factors that differentiate mangrove issues from many collective action problems, in general, are that mangrove issues are intricately related to very complex structures and processes, as the mangrove ecosystem itself encompasses a wide range of issues. Thus, effective solutions require the consideration of the characteristics of this ecosystem.

Collaborative networks, like other social networks, are never static, as they evolve as actors adapting to different endogenous and exogenous change drivers. Therefore, different network structures do not emerge by chance, and positions in the network are not randomly distributed.

Collaborative Mangrove governance among the Government, Private Companies, NGOs, and the Community is a form of multi-actor system integration that allows each party to play a full role in securing their benefits. Under Collaborative Mangrove Governance, the Government plays a major role by issuing environmental policies or laws concerning companies, NGOs, and the community. Collaborative Mangrove Governance generally includes addressing pollution and reducing emissions, both repressive and preventive. Given that nature has the ability to heal itself, the steps taken under Collaborative Mangrove Governance can also assist in some adaptations, such as mangrove conservation.

In the context of mangrove management, Cultural Ecofeminism encourages the association between women and mangroves. Women, through their gender roles (such as family caregivers and food providers) and biology (such as menstruation, pregnancy, and breastfeeding), are believed to have a more intimate relationship with nature. As a result, Cultural Ecofeminists believe that such an association allows women to be more sensitive to the sanctity and degradation occurring in the mangrove ecosystem. This sensitivity should be valued by society as it builds a more direct relationship with the natural world with which humans must coexist.

The closeness between women and nature indicates that women's participation in Mangrove Policy-making is crucial. Women, through their experiences analogous to nature, should be recognized as actors in the policy-making process, from formulation to evaluation. This perspective is developed by Wilson, who discusses how women's and men's reasoning in the context of abortion law-making is closely related to mangrove issues. Men tend to use traditional legal approaches, emphasizing conventional, abstract, objective, and legalistic thinking. The laws produced are ineffective because men do not understand the issues faced by women and nature, resulting in laws that are outside their personal experiences. Such laws will never address the root of the problem. Therefore, Wilson advocates for the involvement of women's experiences, which also represent the oppression experienced by nature, in the law-making process.

The degradation of mangrove land, as mentioned earlier, has reached a concerning point. This issue arises from the government's inability to recover mangrove areas at a rate that matches the deforestation of mangroves. In such a scenario, the participation of all stakeholders becomes a critical matter. One of the most potential stakeholders to involve in mangrove recovery is women because they are capable of contributing significantly. To support this assertion, it is essential to examine Murni Djabar (2018) findings on women's participation in Mangrove Rehabilitation. Her research reveals the following:

1. Fisherwomen exhibit a high level of understanding about mangrove rehabilitation, reaching 80.67% in her study.
2. Women's participation in planning mangrove rehabilitation is substantial, reaching 73.33% in her research.
3. Women actively participate in implementing mangrove rehabilitation, with 79.33% of women involved in the program.
4. Women's involvement in evaluating mangrove participation is significant, reaching 56.67%.

This research indicates that women can be active participants in mangrove rehabilitation, as exemplified by the Maming Group on Mantehage Island.

Drawing lessons from the Maming Group, the government must establish a program for women's involvement in combating deforestation. Without gender equality and women's participation, the efforts for mangrove reforestation and protection are likely to fail. This aligns with the comments from the Global Forest Coalition, stating:

"Due to deep-rooted patriarchy, women suffer from multiple forms of discrimination and marginalization. Despite constituting 83% of the 850 million people depending on forests for their basic needs, women face a lack of formal land tenure and access rights. Women play a central role in forest conservation and restoration, but their say in forest governance is limited, and their access and tenure rights are often overlooked. Forest tenure and access rights tend to shift from women to men, particularly when forests become more commercially attractive, dispossessing and excluding the very women making the greatest contribution to caring for and protecting forests."

Women's involvement in mangrove forest degradation aligns with the concept of the Asian Development Bank and the Strategic Climate Fund's collaboration in 2016. This collaboration focused on reviving Indonesia's forests through the Community-Focused Investments to Address Deforestation and Forest Degradation Project. An integral aspect of this initiative is the integration of gender responsiveness in project implementation. The supported Forest Investment Program, aiming to reduce emissions from deforestation and forest degradation (REDD+), includes mangroves.

The effectiveness of community institutions lies in their strong coordination with district-level actors, such as forest agencies, Bunaken National Park Management, NGOs, and the Watershed Management Agency. The endorsement and acknowledgment of village-level mangrove regulations by the Maming Group, stipulated in the form of village regulations, require effective coordination. Village regulations should align with sub-national and national legislation to ensure consistency and avoid conflicts. This alignment also facilitates further coordination in practice, such as the collaboration between forest guards and local communities in monitoring, apprehending violators, and protecting mangroves. Conflict resolution efforts are also coordinated, with sanctions for violations issued at the village level and repeat violations reported to and handled by public law enforcement mechanisms.

Conclusions

This research shows the pivotal role of women, particularly the Maming Group, in conserving and restoring mangrove ecosystems at Mantehage Island Indonesia. Collaborative endeavors among governmental bodies, non-governmental organizations (NGOs), and local communities, epitomized by the Suara Parampuang organization, further exemplify the efficacy of a concerted approach.

The involvement of the Maming Group across various facets of mangrove management, spanning from strategizing and implementation to assessment and enforcement, indicates a positive correlation between active female participation and the ecological well-being of mangrove habitats. Their innovative methodologies, including imposing sanctions against unauthorized mangrove exploitation, epitomize a community-driven paradigm in environmental governance.

Nonetheless, the research also unveils challenges, notably the ramifications of climate change, particularly heatwaves instigated by El Niño phenomena, impeding seedling transplantation efforts. The imperative for proficient coordination and assistance, especially in mitigating adverse climatic conditions, emerges as a pivotal facet of forthcoming mangrove management endeavors.

Cultural eco-feminism is a pivotal framework for scrutinizing and mitigating mangrove land degradation issues on Mantehage Island. These findings reinforce several tenets of fortifying cultural ecofeminist perspectives, such as the central role of women, acknowledgment of the unique nexus between women and the environment, empowerment of local communities, enactment of novel legislative measures by the Maming Group, the

significance of women's engagement in policy formulation, and the nexus between indigenous culture and environmental stewardship. By fortifying these perspectives, sustainable strides can be undertaken to address mangrove management challenges on Mantehage Island. Augmenting women's roles, empowering local communities, and integrating cultural values constitute quintessential components for sustaining the equilibrium of mangrove ecosystems.

It is incumbent upon the government to foster enhanced collaboration among governmental entities, NGOs, the private sector, and local communities. This collaborative ethos can engender the requisite synergy to confront multifaceted challenges in mangrove preservation. Moreover, embracing a collaborative management model involving proactive involvement from the local community, notably women, in mangrove-related decision-making processes can engender more adaptable and sustainable policies.

While this research furnishes invaluable insights into the role of women, particularly the Maming Group, in mangrove ecosystem management, certain acknowledged limitations persist. Primarily, this research may necessitate refinement in extrapolating findings owing to its concentration on the specific context of Mantehage Island. Consequently, the outcomes may only partially transpose to mangrove scenarios in alternative locales.

Furthermore, this research accentuates the affirmative facets of women's participation in mangrove management. It may warrant deeper exploration into the challenges and impediments encountered by Maming Group encounters. Acknowledging these constraints can afford a more holistic understanding of the dynamics in mangrove preservation endeavors.

To augment this research in the future, scholars will imbue novel dimensions into the study by spotlighting the societal impact and welfare of communities, especially women, engaged in mangrove preservation initiatives. This assessment can encompass income enhancement, community well-being, and overall ecological equilibrium.

Acknowledgement: We appreciate Institute for Research and Community Services (LPPM) Universitas Diponegoro assistance in carrying out this research

References

Agarwal, B. (2009) Gender and forest conservation: The impact of women's participation in community forest governance. *Ecological Economics*, Vol. 68(11), pp. 2785–2799. https://doi.org/10.1016/j.ecolecon.2009.04.025

Allison, J. E. (2017) *Ecofeminism and Global Environmental Politics*. Oxford University Press. https://doi.org/10.1093/acrefore/9780190846626.013.158

Alongi, D. M. (2018) Climate Regulation by Capturing Carbon in Mangroves, in C. M. Finlayson, M. Everard, K. Irvine, R. J. McInnes, B. A. Middleton, A. A. van Dam, & N. C. Davidson (Eds.), *The Wetland Book: I: Structure and Function, Management, and Methods,* Netherlands: Springer. https://doi.org/10.1007/978-90-481-9659-3_236

Anna, Z. (2012) The Role of Fisherwomen in the Face of Fishing Uncertainties on the North Coast of Java, Indonesia. *Asian Fisheries Science Special Issue*, Vol. *25S*, pp. 145–158.

Aspinall, E., White, S., & Savirani, A. (2021) Women's Political Representation in Indonesia: Who Wins and How? *Journal of Current Southeast Asian Affairs*, Vol. 40(1), pp. 3–27. https://doi.org/10.1177/1868103421989720

Bosold, A. L. (2012). Challenging the "Man" in Mangroves: The Missing Role of Women in Mangrove Conservation. *Student Publications*, Vol. 14, pp. 1–31.

Buckingham, S. (2004). Ecofeminism in the Twenty-First Century. *The Geographical Journal*, Vol. 170(2), pp. 146–154. JSTOR.

Cañada, M. C. B., Velasco, C. R. & Lota, M. M. (2022). Gender Roles in the Utilization and Challenges in the Management of Mangrove Forests in Casiguran, Aurora, Philippines. *Open Journal of Ecology*, 12(4), pp. 257–270. https://doi.org/10.4236/oje.2022.124015

Carugati, L., Gatto, B., Rastelli, E., Lo Martire, M., Coral, C., Greco, S. & Danovaro, R. (2018). Impact of mangrove forests degradation on biodiversity and ecosystem functioning. *Scientific Reports*, Vol. 8(1), pp. 13298. https://doi.org/10.1038/s41598-018-31683-0

Dang, H. D. (2020) Sustainability of the rice-shrimp farming system in Mekong Delta, Vietnam: A climate adaptive model. *Journal of Economics and Development*, Vol. 22(1), pp. 21–45. https://doi.org/10.1108/JED-08-2019-0027

DasGupta, R. & Shaw, R. (2017) *Participatory Mangrove Management in a Changing Climate: Perspectives from the Asia-Pacific*. Springer Japan.

D'Eaubonne, F. (1974) *Le féminisme ou la mort*. Pierre Horay Editeur.

Djabar, M. (2018). Partisipasi Wanita Dalam Rehabilitasi Hutan Mangrove Di Desa Inalatan Kecamatan Bonubogu Kabupaten Buol. *Gorontalo Journal of Forestry Research*, Vol. 1(1), pp. 24–35. https://doi.org/10.32662/gjfr.v1i1.73

Djamaluddin, R. & Djabar, B. (2022) Mangrove species of Mantehage Island, Bunaken National Park, North Sulawesi, Indonesia. *Biodiversitas Journal of Biological Diversity*, Vol. 23(6), pp. 2845–2852. https://doi.org/10.13057/biodiv/d230609

Duke, N. C. (2011). Mangroves. In D. Hopley (Ed.), *Encyclopedia of Modern Coral Reefs: Structure, Form and Process* (pp. 655–663), Netherlands: Springer. https://doi.org/10.1007/978-90-481-2639-2_108

Duke, N. C. & Schmitt, K. (2014) Mangroves: Unusual Forests at the Seas Edge. In M. Köhl & L. Pancel (Eds.), *Tropical Forestry Handbook* (pp. 1–24) Berlin: Springer Heidelberg. https://doi.org/10.1007/978-3-642-41554-8_129-1

Dunn, W. N. (2008) *Public Policy Analysis: An Introduction*. Pearson Prentice Hal.

Ehrlich, E. (2017) *Fundamental Principles of the Sociology of Law*, London: Taylor & Francis.

Fitriana, R. & Stacey, N. (2012) The role of women in the fishery sector of Pantar Island, Indonesia. *Asian Fisheries Science*, Vol. 25(Special Issue), pp. 159–175.

Gimbutas, M. (1974). *The Gods and Goddesses of Old Europe: 7000 to 3500 BC Myths, Legends and Cult Images*. University of California Press.

Harari, Y. N. (2018) *21 Lessons for the 21st Century*. Random House.

Harper, S., Zeller, D., Hauzer, M., Pauly, D., & Sumaila, U. R. (2013) Women and fisheries: Contribution to food security and local economies. *Marine Policy*, Vol. 39, pp. 56–63. https://doi.org/10.1016/j.marpol.2012.10.018

Kirschbaum, M. U. F. (2003) To sink or burn? A discussion of the potential contributions of forests to greenhouse gas balances through storing carbon or providing biofuels. *Proceedings of the IEA Bioenergy Task 31 Workshop "Principles and Practice of Forestry and Bioenergy in Densely-Populated Regions,"* Vol. 24(4), pp. 297–310. https://doi.org/10.1016/S0961-9534(02)00171-X

Menéndez, P., Losada, I. J., Torres-Ortega, S., Narayan, S. & Beck, M. W. (2020) The Global Flood Protection Benefits of Mangroves. *Scientific Reports*, Vol. 10(1), pp. 4404. https://doi.org/10.1038/s41598-020-61136-6

Merchant, C. (1983) *The Death of Nature: Women, Ecology, and the Scientific Revolution*. London: Harper & Row.

Montgomery, J. M., Bryan, K. R. & Coco, G. (2022) The role of mangroves in coastal flood protection: The importance of channelization. *Continental Shelf Research*, Vol. 243, pp. 104762. https://doi.org/10.1016/j.csr.2022.104762

Mwangi, E., Meinzen-Dick, R. & Sun, Y. (2011) Gender and Sustainable Forest Management in East Africa and Latin America. *Ecology and Society*, Vol. 16(1), pp. 17. JSTOR.

Natalis, A., Purwanti, A. & Asmara, T. (2023a) Anthropocentrism Vs Ecofeminism: How Should Modern Environmental Law Be Reformed? *Sortuz: Oñati Journal of Emergent Socio-Legal Studies*, Vol. 13(1), pp. 38–68.

Natalis, A., Purwanti, A. & Asmara, T. (2023b) The Law's Critical Role in Developing Human-Environment Relationships after COVID-19 Pandemic (A Study of Ecofeminism). *International Journal of Sustainable Development and Planning*, Vol. 18(1), pp. 153–160. https://doi.org/10.18280/ijsdp.180116

Nguyen, T. H. M. & Dang, T. H. (2018) Gender role in mangrove resource management: Case study in Trieu Phong district of Quang Tri province, Vietnam. *Journal of*

Vietnamese Environment, Vol. 9(2), pp. 92–98. https://doi.org/10.13141/jve.vol9.no2.pp92-98

Pearson, J., McNamara, K. E. & Nunn, P. D. (2019) Gender-specific perspectives of mangrove ecosystem services: Case study from Bua Province, Fiji Islands. *Ecosystem Services*, Vol. 38, pp. 100970. https://doi.org/10.1016/j.ecoser.2019.100970

Plumwood, V. (2002) *Feminism and the Mastery of Nature*. London: Taylor & Francis.

Pratisti, C., Saksono, H. & Suadi. (2012) Partisipasi Perempuan Dalam Konservasi Mangrove Di Desa Pasar Banggi Kabupaten Rembang. *Jurnal Perikanan Universitas Gadjah Mada*, Vol. 14(1), pp. 32–45. https://doi.org/10.22146/jfs.9047

Purwanti, A., Wijaningsih, D., Mahfud, M. A. & Natalis, A. (2022) Gender Inequality Against Women Fishers in Indonesia. *Indonesia Law Review*, Vol. 12(3), pp. 121–136.

Purwanti, A., Wijaningsih, D., Mahfud, Muh. & Natalis, A. (2023) Sustainable Development Goals for Empowering Women Fishers Through Mangrove Use. *Review of Economics and Finance*, Vol. 20, pp. 907–916. https://doi.org/10.55365/1923.x2022.20.103

Ray, R., Ganguly, D., Chowdhury, C., Dey, M., Das, S., Dutta, M. K., Mandal, S. K., Majumder, N., De, T. K., Mukhopadhyay, S. K. & Jana, T. K. (2011) Carbon sequestration and annual increase of carbon stock in a mangrove forest. *Atmospheric Environment*, Vol. 45(28), pp. 5016–5024. https://doi.org/10.1016/j.atmosenv.2011.04.074

Sadeer, N. B., & Mahomoodally, M. F. (2022) *Mangroves with Therapeutic Potential for Human Health: Global Distribution, Ethnopharmacology, Phytochemistry, and Biopharmaceutical Application*. Elsevier Science.

Sandilyan, S., & Kathiresan, K. (2012) Mangrove conservation: A global perspective. *Biodiversity and Conservation*, Vol. 21(14), pp. 3523–3542. https://doi.org/10.1007/s10531-012-0388-x

Septory, H. F. (2014) Konflik Kewenangan Dalam Pengelolaan Hutan Pesisir Tinjauan Hukum Kehutanan. *Masalah-Masalah Hukum*, Vol. 43(3), pp. 453–459. https://doi.org/10.14710/mmh.43.3.2014.453-459

Shiva, V., Mies, M. & Salleh, A. (2014) *Ecofeminism*. Zed Books.

Sormin, H., Gerung, G. S. & Rembet, U. N. W. J. (2015) Community structure of seaweed beds in Mantehage Island, North Sulawesi, Indonesia. *Aquatic Science & Management*, Vol. 3(2), pp. 32–37. https://doi.org/10.35800/jasm.3.2.2015.14043

Sturgeon, N. (2016). *Ecofeminist Natures: Race, Gender, Feminist Theory and Political Action*. London: Taylor & Francis.

Sunkur, R., Kantamaneni, K., Bokhoree, C. & Ravan, S. (2023). Mangroves' role in supporting ecosystem-based techniques to reduce disaster risk and adapt to climate change: A review. *Journal of Sea Research*, Vol. 196, pp. 102449. https://doi.org/10.1016/j.seares.2023.102449

Treviño, M. & Murillo-Sandoval, P. J. (2021) Uneven consequences: Gendered impacts of shrimp aquaculture development on mangrove dependent communities. *Ocean & Coastal Management*, *210*, 105688. https://doi.org/10.1016/j.ocecoaman.2021.105688

van Oudenhoven, A. P. E., Siahainenia, A. J., Sualia, I., Tonneijck, F. H., van der Ploeg, S., de Groot, R. S., Alkemade, R. & Leemans, R. (2015) Effects of different management regimes on mangrove ecosystem services in Java, Indonesia. *Ocean & Coastal Management*, Vol. 116, pp. 353–367. https://doi.org/10.1016/j.ocecoaman.2015.08.003

Warren, K. J. (2001) Feminist Theory: Ecofeminist and Cultural Feminist. In N. J. Smelser & P. B. Baltes (Eds.), *International Encyclopedia of the Social & Behavioral Sciences,* pp. 5495–5499. Pergamon. https://doi.org/10.1016/B0-08-043076-7/03949-8

Weeratunge, N., Snyder, K. A. & Sze, C. P. (2010) Gleaner, fisher, trader, processor: Understanding gendered employment in fisheries and aquaculture. *Fish and Fisheries*, Vol. 11(4), pp. 405–420. https://doi.org/10.1111/j.1467-2979.2010.00368.x

Yee-Man Lam. (2017) A Zen-Flavored Feminist Environmental Selfhood and its Contemporary Implications. *Ethics and the Environment*, Vol. 22(2), pp. 99–123. JSTOR. https://doi.org/10.2979/ethicsenviro.22.2.05

Zakiyah, U., Isdianto, A., Mulyanto & Suprapto, K. D. (2023). *Konservasi Mangrove di Indonesia*. Media Nusa Creative (MNC Publishing). https://books.google.co.id/books?id=jE3OEAAAQBAJ