

Chapter 5

Gender and Climate Change Vulnerability: A Case Study of a Coastal Community in Pramuka Island, the Seribu Islands



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Abstract Climate change poses a significant threat to people's lives and livelihoods around the globe, and communities of small low-lying islands of the developing world are especially vulnerable. As a growing scholarship demonstrates, the impacts of climate change on people's lives vary along gender lines, among other factors. Thus, understanding the gendered implications of climate change risks and impacts is essential to inform policies that are responsive to the needs of vulnerable groups. This chapter explores the implications of climate change impacts for the lives of women and men on a small and vulnerable coastal community on Pramuka Island, a part of the group of Seribu Islands, Jakarta, Indonesia. The study examines how changes in women's and men's employment, income, and time management reflect the ways in which environmental changes, including climate change, shape the everyday lived experiences of vulnerable local communities of small islands.

Keywords Climate change · Gender · Fisheries · Coastal community

5.1 Introduction

Indonesia, the largest archipelagic state with over 17,500 islands, faces a significant risk of climate change impacts, including floods, droughts, sea level rise, increasing temperatures, and changing rainfall patterns (World Bank, 2020; Wong et al., 2014). Such risks are even higher in smaller islands (Wirawan, 2010), such as the Seribu Islands (Firman et al., 2011). With a constellation of over 110 small islands to the north of the capital city Jakarta, most of the Seribu Islands are only ± 1 -meter-high

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from sea level (Statistics Kepulauan Seribu Administrative Regency, 2017a, b) and are known for their weak resource management practices (Fauzi & Buchary, 2002). The communities living on the Seribu Islands are especially vulnerable to the negative impacts of climate change, while also being among the most socioeconomically vulnerable in the country (Firman et al., 2011). Such vulnerabilities are enhanced by exposure to natural/human-induced disasters, with the experience of disasters being mediated by gender roles and gender relations that “shape and are shaped by social, spatial and temporal structures and practices” (Tickamyer & Kusujarti, 2020, p. 233).

In the context of environmental change and, more specifically, climate change, a significant scholarship has demonstrated that the impacts of such changes are not gender neutral (see, e.g., Agarwal, 1992, 2010; Arora-Jonsson, 2014; Dankelman & Jansen, 2010; Nelson et al., 2002). Gender, a concept that invokes ideas around gender roles and gender relations, also serves as an analytic category that helps us understand how gendered power relations permeate institutions and shape social practices, and access to knowledge and resources (see, e.g., Kurian, 2019; MacGregor, 2019; Arora-Jonsson, 2014). Feminist scholars have argued that gendered values and masculine ideologies underpin colonialism, capitalism, and a development agenda that has led to the crisis of climate change (see, e.g., MacGregor, 2019; Gaard, 2015). In addition, women in the Global South, particularly from lower socioeconomic classes with limited access to resources and whose social contexts are framed by gendered social and cultural norms, are more likely to face greater challenges of survival. For example, climate change-related natural/human-induced disasters and environmental degradation have significant implications for women’s workload and vulnerability (Nagel, 2017; Tickamyer & Kusujarti, 2020). Yet, how women, men, families, and communities negotiate the realities of a climate-changed, disaster-prone world, particularly in the context of a developing island state such as Indonesia, requires more academic attention.

As scholars have noted, understanding differences of community experiences and responses toward the risk of climate change on the basis of gender is crucial to develop strategies for just and equitable climate-related policies, while increasing the resilience of already marginalized groups (Tickamyer et al., 2014). Despite the significance of this issue, research focused on gender roles, relations, and values in the context of sustainable development and climate change impacts on small islands in Indonesia is limited (Tickamyer et al., 2014). This chapter addresses the gap in the literature on gender and climate change in Indonesia through a specific focus on a small and vulnerable coastal community on Pramuka Island, a part of the group of Seribu Islands.¹ It explores how changes in women’s and men’s employment, income, and time management reflect the ways in which environmental changes, including climate change, shape the everyday lived experiences of vulnerable local communities of small islands. It begins with a brief background on climate change

¹We acknowledge the reality of gender diversity that goes beyond the binaries of the roles and experiences of males and females. In the context of this study, all the research participants self-identified as male or female and this is reflected in the language we use.

impacts on Indonesia and a review of the gender and climate change scholarship and then provides an overview of the research methodology before turning to the findings and analysis, which contribute to a bottom-up, gender-sensitive advancement of climate adaptation policies from the perspective of the local community. As Boissière et al. (2013) argue, the view of the local is fundamental to determining appropriate strategies to adapt to the changing climate.

5.2 Climate Change Impacts and Gender in Indonesia

Anthropogenic climate change, as flagged by the reports of the Intergovernmental Panel on Climate Change (IPCC), has significant negative impacts on the economy, society, environment, and culture of countries across local, national, and global scales (Wong et al., 2014; IPCC, 2013a, b). Alongside the impacts on biodiversity, patterns of precipitation, droughts, and floods in many parts of the world, the reports note that low-lying and small islands are most vulnerable to severe impacts of climate change (Wong et al., 2014). In the context of Indonesia, evidence of climate change is seen, for example, in the decrease in the annual precipitation and drier climate condition in West Java (Kaars & Dam, 1997). The country also experienced its hottest year in 2016, with the average temperature being recorded as 1.2 Celsius higher than usual (Indonesian Agency for Meteorology, Climatology and Geophysics, 2018). Such changes, with the resulting water scarcity and intensified droughts in parts of Java Island, for example, have affected agricultural systems and thus impacted the livelihoods of communities (Widiyanti & Dittmann, 2014). The shifting average temperature in Indonesia has also led to a decline in rice crop yield and farmers' income, affecting the country's social and economic systems (Caruso et al., 2016). The social and economic impacts of climate change on sustainable development in Indonesia, spanning areas of food production, health, infrastructure, and livelihoods, are not uniform but vary across gender, class, and other cross-cutting societal cleavages.

The relationship between humans and the environment is gendered, and this relationship varies in different social contexts and changes over time (Dankelman & Jansen, 2010). Furthermore, gender also plays a role in at least three different aspects of climate change, namely, the creation of climate change knowledge, experience of climate change impacts, and the responses toward them (MacGregor, 2010; Arora-Jonsson, 2014). In the context of developing countries, Agarwal (2010) argues that women and men are disparately affected by environmental change in terms of their income, time, health, nutrition, knowledge system, and social-support network, and their responses toward environmental governance also vary. Women's responsibilities for ensuring adequate access to water for household needs result in putting them at a higher risk of physical injuries (such as spinal injuries), especially during droughts when they need to walk further (Nagel, 2017; Sorenson et al., 2011). In addition, these women also sacrifice their time that they could otherwise use for education and income-earning activities. Such gendered impacts of

environmental changes are reflected in the differential impacts of climate change, with implications for local environmental governance.

In the Indonesian context, vulnerability to climate change is enhanced by social inequalities, and as in the case of disaster risk and vulnerabilities, “gender is invariably a central component” of the factors that increase such vulnerability (Tickamyer & Kusujiarti, 2020, p. 236). Patriarchal gender relations in Indonesia reinforce male dominance (Hubeis, 2010) and, as elsewhere in much of the rural Global South, women are responsible for domestic tasks, including provision of water for cooking, washing, and drinking, as well as primary responsibility for childcare, while men are designated as the major income earner in the family. Aside from patriarchal views, family dynamics and gender relations in Indonesia are also strongly influenced by religious norms, with an expectation for women to be obedient wives and mothers, while fathers are viewed as the custodians and protectors of the family (Rinaldo, 2008). Thus, gender roles and relations are deeply imbued by power inequalities that in turn shape the nature of climate change impacts on people.

5.3 Pramuka Island, the Seribu Islands: The Context

Pramuka Island, one of the islands in the Seribu Island archipelago, is located 74 km from the main island of Jakarta (see Figs. 5.1 and 5.2). It has a total area of 16 Ha and lies 1 m above sea level.

The following graphs from the local meteorological station show the changes in average temperature and rainfall in the Seribu Islands from 1973 to 2017 (see Fig. 5.3), which are potentially reflective of climate change impacts.



Fig. 5.1 Indonesia map. (Google Maps, 2022)



Fig. 5.2 Pramuka Island map. (Panggang Island Administrative Village, 2018; Google Maps, 2018)

Furthermore, statistics of the occurrence of storms and rainy days in the Seribu Islands (see Fig. 5.4) also show gradual changes. The number of rainy days in 2011, 2014, and 2016 increased gradually as did the frequency of storms. Although the cause of these changes has not been definitively established, they are in keeping with predicted climate change-related impacts.

At the time the research was conducted in 2018, Pramuka Island had 1894 inhabitants, with fishing as the dominant community activity (Panggang Island Administrative Village (PIAV), 2018). Of this population, 1059 (55.9%) were adults and 835 (44.1%) children. The gender make-up of the population was 955 (50.4%) females and 939 (49.6%) males. Most people in Pramuka Island live in a family unit. The total number of households on the island comprises 584 units, of which only 71 (12.2%) are deemed female-headed households. Most men in the island work as fishermen, while women more often work as traders. The graph below describes the distribution of occupations in the community at the village level (Fig. 5.5).

In line with the IPCC's (2014a, b, 2021) observations about coastal flooding in Southeast Asia, including Indonesia, and predictions about the displacement of people in low-lying coastal zones by 2100, Firman et al. (2011) argue that people in the Seribu Islands and on the main island of Jakarta are vulnerable to the risk of climate-related hazards in terms of flooding, sea-level rise, and intensified storms. The increased frequency of natural/human-induced disasters and climate-related hazards thus threatens the livelihood of local communities, exacerbating the vulnerability of these islands.

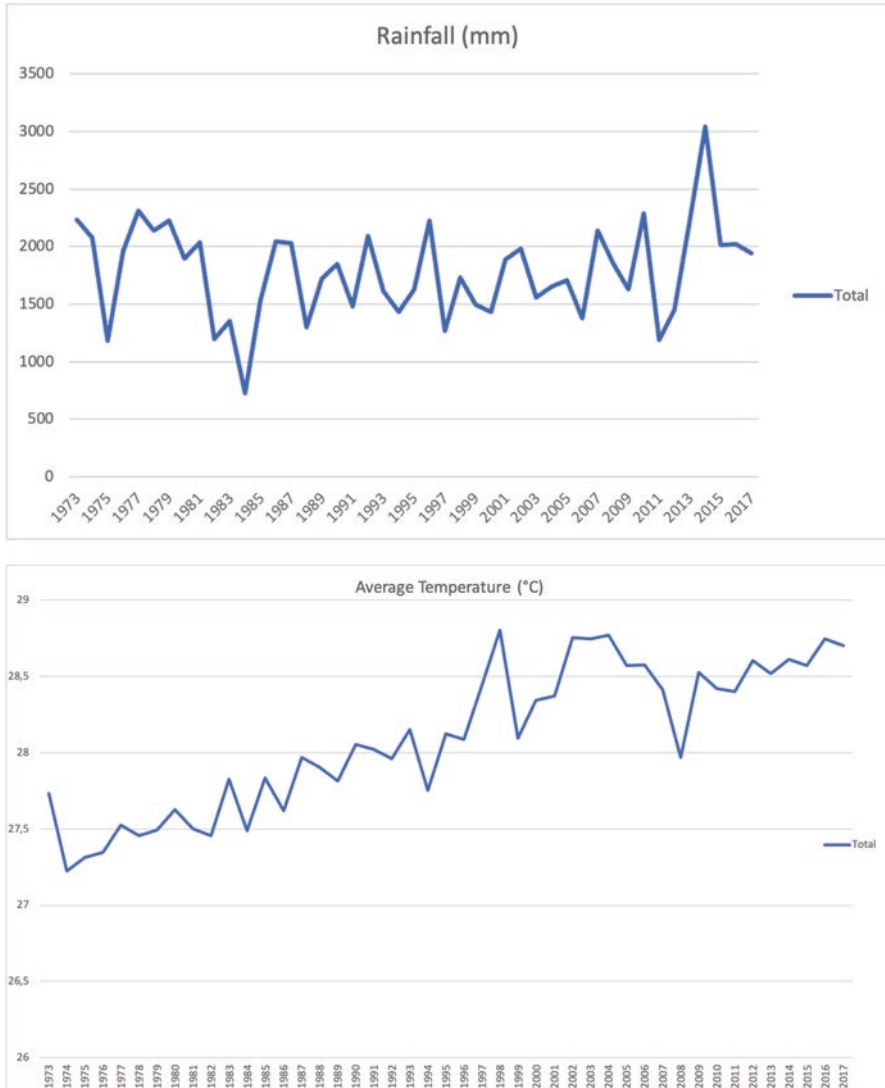


Fig. 5.3 Temperature and rainfall change. (Indonesian Agency for Meteorology, Climatology and Geophysics, 2018)

5.4 Methodology

This research deploys an interpretivist qualitative research methodology to investigate Pramuka islanders’ understanding of the environmental changes they observe and the challenges that such changes pose to their community. It draws on the stories and experiences of members of the community. We used semi-structured

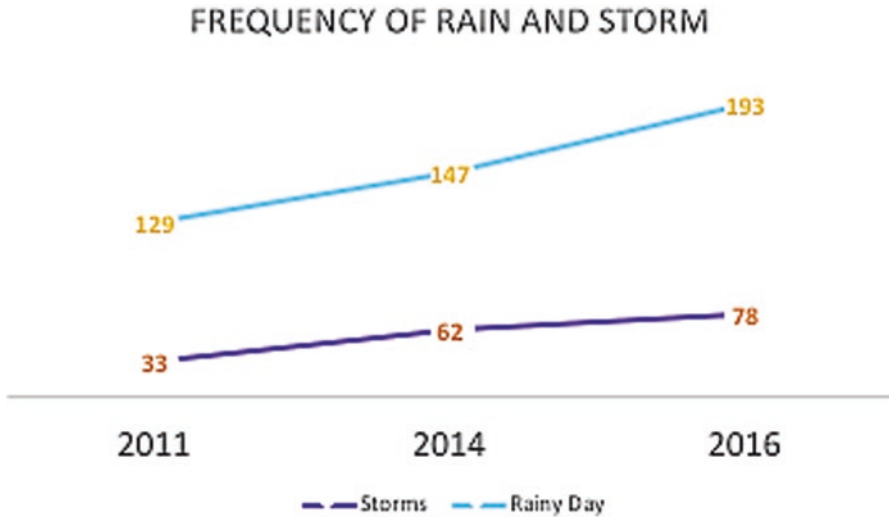


Fig. 5.4 Frequency of rain and storm in the Seribu Islands (2011, 2014, and 2016). (Statistics Kepulauan Seribu Administrative Regency, 2012–2017)

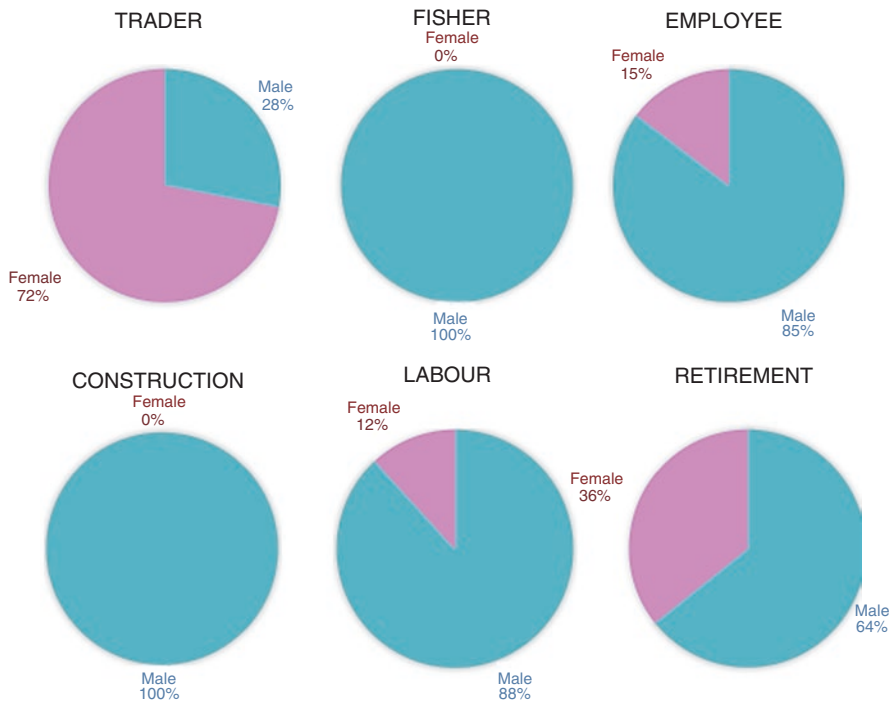


Fig. 5.5 Distribution of main occupations of females and males in Pramuka Island. (PIAV, 2018)

interviews to develop a rich understanding of the experiences and impacts of climate change risks of women and men. Using purposive sampling, nine male and seven female participants were selected on the basis of gender and occupation to capture their everyday lived experiences in the face of a climate-changed world.

The 16 semi-structured interviews, conducted in 2018, lasted approximately 30 min to 1 h. To maintain the confidentiality of the participants, we coded and classified the respondents using their gender, an ordinal number, and occupation, for instance: Female 1, Trader; or Male 1, Fisherman. In addition, three semi-structured interviews were also conducted with representatives of the Indonesian government working in the areas of climate change and/or gender, including representatives from the Ministry of Environment and Forestry (coded as MoEF1), Ministry of Women Empowerment and Child Protection (coded as MoWE1), and the Seribu Islands Regional Environmental Agency (coded as SIEA1). The purpose of these interviews was to gain broad information about the community's current situation and climate change.

Interview questions covered aspects of the community's life, such as their perceptions of the changes in seasonal patterns, fisheries resource depletion, the frequency and intensity of severe storms, waves, and rainfall, and availability of freshwater. The interview questions also explored how the community copes with any changes, as well as the nature of gender relationships. Additionally, field observation was conducted and available records concerning the research topic were collected to strengthen the empirical evidence of this research. The interviews were conducted in Bahasa and then translated and transcribed by the first author. Data from interviews were thematically analyzed (Braun & Clarke, 2006; Lawless & Chen, 2019) and examined against insights from the literature on gender and climate change. A close reading of interview transcripts led to a process of generating themes, followed by an analysis and discussion of these themes. An explanation of the case was developed in a narrative fashion in a way that was theoretically rigorous (Yin, 2014; Bryman, 2016). The themes spanned gender norms and livelihoods, reduction in fish stocks and their implications for men and women, and the impacts of changing weather patterns on women and men.

5.5 Findings

5.5.1 *Gender and Livelihood in the Pramuka Island*

The Pramuka Island society follows traditional gender norms in Indonesia where women are typically responsible for domestic tasks such as making food for the family and taking care of children. In contrast, men tend to be the primary breadwinners of the family and act as family representatives at public hearings, such as those around the use of natural resources, including fisheries and aquaculture program development. Participants described these gender expectations as follows:

We (men) must make an effort to support children and wife; we need to fulfil basic family needs every day; we need to eat every day; we can't just sit. When the weather (in ocean) is not supportive, we look for another job on the land, like construction work. (Male 9, Fisherman)

Yes, I take the role for taking care of children. Their father works, I help him with selling these (food products). (Female 2, Trader)

However, despite these gender norms, women also undertake work outside the home to gain additional income for their families, such as selling food and produce, when their time allows. Similarly, men also contribute to domestic labor, such as undertaking some childcare activities when required. This pattern of some men performing domestic roles when they are not fishing or after they get home from the ocean is also found in several other fishing communities in Indonesia (Indrawasih, 2015).

Fishing is the major income-earning activity for men, serving as the primary source of income for 62.2% of the total male population in Pramuka Island (PIAV, 2018). No women were involved in fishing. The fishermen normally go fishing between sunrise and late afternoon every day when the weather is good. Interviews and field observations revealed that there are two categories of fishermen: independent fishers and dependent fishers. The dependent fishers usually get a loan from their patron to purchase a boat and then sell their fish – either for consumption or for aquariums – exclusively to the patrons. They are also required to catch enough commercial fish to pay their debts to the patron. On the other hand, independent fishers have control over their income with no debts to pay off and their fish catch is made up of a mix of commercial and noncommercial fish. The patron–client system in small-scale fishing practices in Indonesia is a common practice, with many small island territories following this fishing pattern (Miñarro et al., 2016).

Fishing on Pramuka Island is highly dependent on the weather situation and fishermen tend not to go fishing during rainy and windy weather. When they cannot go fishing, they usually engage in other forms of employment to sustain themselves economically, including working in the tourism sector (mostly during weekends or holidays) by renting boats and providing recreational services for tourists.

Women, on the other hand, mostly perform domestic roles as their main responsibility whilst running micro-enterprises to support the family financially, when necessary. Women tend to participate in trading activities, and at the time of this study, they made up 72% of traders at the village level, while 28% were men (PIAV, 2018). Traders are typically micro-entrepreneurs, such as stallholders and street vendors, who sell a range of products including groceries, fish processed foods, snacks, and beverages. In interviews, many women traders expressed their preference for being stallholders or street vendors as a way of helping the family's financial situation while managing their domestic duties. Some of the women managed these responsibilities by bringing their children to work with them and letting them play around their stalls. Some children on the Island, especially adolescent girls, were also seen helping their mothers to look after their stalls and helped to serve

foods and drinks when customers visited the shops. One female trader recalled a similar experience of how, when she was a child, she had helped her mother with her selling activities:

Since I was a kid my mother had taught me to sell, walking around the island after school, and before school; I was selling fried banana, traditional cakes; even now I'm passionate about selling. (Female 2, Trader)

No women, however, were seen working as fishers. The gendered notions of fishing activity vary across coastal communities in Indonesia. For instance, women in Deli Serdang Regency, North Sumatra, Indonesia, similar to women in Pramuka Island, consider fishing atypical and even taboo for women. But in other parts of the country, such as in Hitu Village, Ambon, and Kalibuntu Village, East Java, women go fishing in the ocean with rods or even plunge into the sea to find snails (Indrawasih, 2015).

In terms of the role of women and men in public debates and discussions, both women and men in Pramuka Island appeared to participate in public discussions and trainings provided by the local government. From our interviews, we learned that several trainings had been organized by the government, such as cooking training for women, fish cultivation training for men, and tourism-related training for both. Despite the opportunities provided for women to attend public discussions and trainings, several women respondents expressed some constraints in participating at such meetings, especially when they also had multiple duties of rearing children and working as traders. A woman trader stated:

The cooking training is often organised by the village government, they bring trainers from Jakarta, like a teacher, supervisor, in the field of cooking, and then we (women) in the neighbourhood will get a call. That (training calls) depends on the type of discussion itself, like fish cultivation, males; cooking, females; tourism, both male and female ... I didn't get involved in the discussion, it was males ... I also had to sell my stuff around the village, I had no time for the discussion sometimes. (Female 3, Trader)

These differences in gender roles, occupations, and practices evident in Pramuka Island have implications for how climate change-related impacts may affect men and women. Women's inability or reluctance to participate in training activities and public discussions, as seen in our interviews, reveal the pressures on their time as they balance multiple commitments of domestic responsibilities and income-generating activities. It also indicates the potential challenges of ensuring women's participation in other important activities, such as those involving governance and decision-making – deemed essential to bring about transformative change in society (see Kronsell, 2013).

5.5.2 *Gendered Impacts of Reduced Fish Stock and Changing Weather Patterns*

The Seribu Islands, like the rest of the country, have experienced decades of unsustainable development, as evident in the case of marine resources management (see Fauzi & Buchary, 2002). Under a political regime marked by “corruption, collusion and nepotism,” “resources were heavily exploited, destructive fishing practices were widely used, and widespread degradation of the marine areas occurred” (ibid., p. 168). The continuation of many of these practices and their consequences are evident in Pramuka Island even now.

Impacts on Women In relation to fish resources in the Island, both women and men have noticed a decline in fish stock in recent years. This reduction has impacted livelihoods along gender lines. For example, in interviews, women referred to the impacts of fish stock depletion on their livelihood in terms of their financial stability and greater pressures on their time. The lack of fish stocks has reduced women traders’ ability to supplement their incomes through selling of processed fish products in their stalls. In addition, the reduced fish catch has an impact on their domestic roles (especially the wives of fishermen), such as the food they cook for the family. Whereas previously they used to serve fish for their families from their husband’s fish catch on a regular basis, they now often have to buy fish. Female respondents expressed how the fish depletion on the island impacted their livelihood, as follows:

When they (fishermen) don’t go fishing and don’t get money, they will be reluctant to buy anything, maybe that’s how it works, like today the selling is low. (Female 2, Trader)

When the fish are lacking, like this time around, I don’t have fish supply to sell (fish-based food products). I usually buy directly from fishermen, clean the fish, and put it in the refrigerator, it will stay good for 1 month, and I can sell open fire grilled fish for tourists. When I don’t have stock of fish, well ... (Female 3, Trader)

Destructive Fishing Practices For fishermen, the decrease in fish stocks in Pramuka Island had an impact on their fishing practices and the time they needed to catch fish. They were concerned about their income declining as the result of fish depletion and, hence, changed their fishing practices to attempt to stabilize their income. For example, they went fishing in areas that were farther from their own island (across provincial borders) and also tried to catch as many fish species as possible. These strategies, however, required some fishermen to spend more time on the ocean to find fish to catch (staying away overnight).

In addition, many of the fishermen we interviewed also elaborated on the use of harmful fishing practices by some fishers. They admitted that some fishermen on the Island were still using destructive fishing gear in order to obtain higher catch and incomes. The depletion of fish stocks in Pramuka Island combined with the use of

harmful fishing equipment (such as potassium and *muro-ami* net²) have put fishermen in a vulnerable situation through the lower fish catches and undermined people's income and well-being. One male fisher respondent described the implications of reduced income for family dynamics, with greater stress that comes from being unable to support the family including the possibility that women may divorce their husbands if they could not maintain an adequate income. This concern contributes to many fishermen's willingness to use harmful, but cheaper, fishing methods to earn more income, such as using decompressors as a substitute for an oxygen tank while diving despite knowing that it could harm their own physical health. Research on the use of decompressors for diving equipment among Jakarta and Seribu Island fishermen found that over 50% of the fishermen had experienced decompression sickness (DCS) in the form of headache, vertigo, movement dysfunction, visual disturbance, chest pain, vomiting, joint pain, neurological dysfunction, nausea, or convulsions, after they had used it three or more times a day (Wahab et al., 2008). A male fisher respondent referred to the experiences of another fisherman, as follows:

Mr. Sarip's son was tempted by the money he would get by using it (muro-ami net and decompressor). The boss said, "I'll pay you this much just to dive and get fish", and after he dived (using decompressors), he got paralysed. Did the boss want to take the responsibility for it? No, I've paid you, he's paralysed until now, and he got divorced by his wife, I feel sorry for him, and he's got one child. (Male 9, Fisherman)

Seasonal Changes Beyond the aforementioned hardships and vulnerability of fishermen in Pramuka Island as a result of fish resource depletion, fishermen spoke about their perceptions of changes in weather and seasonal patterns that seemed to affect their fishing practices. They referred to unpredictable weather changes and believed the intensity and frequency of storms and cyclones had become stronger compared to their recollection of the past. Such changes affected their fishing schedules and, when they did decide to go fishing, heightened the risks they faced. As one fisherman said:

In the past there were less (storms), and the wind had its own path ... But now, sometimes the wind comes from the south and then hits from the west, like that ... When we go fishing that could be troublesome, we could be trapped on the ocean. ... My friends experience that one time, their boat was gone, only them with floats, thank God they were safe ... (Male 9, Fisherman)

Aside from the fishery sector, changes in weather patterns affect the sustainability of trading activities, predominantly run by women who have few options other than trading because of their modest educational levels (Indrawasih, 2015; Babbitt et al., 2015). On Pramuka Island, women who ran stalls as a source of secondary income for their families normally began work early morning and finished in the afternoons,

²Pursell (2002) depicts muro-ami as a system of drive-in net fishing that involves encircling net together with pounding devices to scare fish into bag nets. The devices are pounded of the mid-level fish that school above the reef and bottom dwelling fish which can severely damage coral reefs.

although this would be extended during periods when there were many tourists arriving on the island.

Many of the women respondents referred to how changes in climate variables such as rainfall and seasonal patterns, and also some climate change-related hazards, including cyclones, strong winds and storms, impacted their stalls' physical condition as well as their trading activities. For example, unseasonal weather patterns, including unexpected rains and storms, have led to the postponement of the production of commodities they sell, such as fish crackers and seaweeds. One woman trader explained this as follows:

It (the uncertain weather pattern) affects the production of my supplies, like when I'm making fish crackers, it needs a dry weather to dry them, because I use the sun to dry the crackers. When the weather is rainy and season is uncertain, it makes the process difficult ... so I have to postpone the process. (Female 5, Trader)

Moreover, women traders believed that the changing intensity and frequency of storms and cyclones had had a negative impact on the physical condition of their stalls, especially stalls that were made out of delicate materials such as bamboo and fabrics. Recent tornadoes in Pramuka Island were identified by the respondents as having a higher intensity of wind, compared to their past experiences of tornadoes. Respondents reflected on the most recent strong winds on the island and how they differed from previous cases:

Now it (storm) is more often compared to the past; that February storm was the worst, I've never seen a big storm like that since I was a kid, I've just seen big waves, usually in December, but that's all, not with strong wind like it was in February. (Female 3, Trader)

Usually the wind was far, we could see the wind running on the ocean. Because it was distant, the storms didn't get a chance to go to the island ... Now it's almost every year, since 2010, usually it's a tornado. In this island alone, there was a huge one in 2016, it destroyed the quayside's canopies, it was a tornado. Also, there was another tornado in 2017, all these stalls were wiped out, there, in front of those stalls, they were hit by the tornado. (Male 1, Fisherman)

Their statements are reinforced by reports from Hamonangan (2017) and Pribadi (2018), which reported the occurrence of strong winds and a tornado in December 2017 and February 2018 on the island. The report states that while bad weather is normal in Pramuka Island and its surroundings, the intensity of the winds has been stronger than usual lately. The high frequency and intensity of the strong winds have damaged infrastructure on Pramuka Island and caused financial loss from the damage. Such intense weather events consequently affected the women traders' ability to earn an income, as their shops were unable to operate during the period of wind and during the repairing of the physical damage. However, some women tried to sell their goods by using other techniques, which were considered to be more time and energy consuming, for instance, through pushing a cart.

My stall was on the tree (blown by the wind) ... I did not open my shop for 3 months, because of the wind ... We are human, so use our brain to do something, I pushed cart to sell around the village, sell anything, coffee, instant noodles, anything. (Female 7, Trader)

From the view of female traders in Pramuka Island, climate change-related risks, including stronger and more frequent storms and uncertain weather patterns, have built up additional challenges to their daily life. The uncertain weather patterns have interrupted their commodity production schedule, while the intensified storms have demolished many women's stalls, with implications for women's income and time.

From the above discussion, it is evident that both women and men in the Pramuka Island are affected by the changes to seasonal weather patterns, which are likely to be linked to climate change-related impacts. While fish stocks are undoubtedly affected by the widespread use of destructive fishing practices (Fauzi & Buchary, 2002), climate change-related factors such as changing rainfall patterns, intensification of storms, and warming sea temperatures can affect both fishing practices and fish stocks. The reduction in fish catch has gender-specific impacts, negatively affecting women's and men's occupations, income-earning capacity, and their marginalization and vulnerability.

5.6 Analysis and Policy Implications

The gendered implications of climate change for Pramuka Island society are mirrored in other societies elsewhere in the world, although conceptions of gender vary across place and time and rely on the subjective and cultural meanings specific to a society (Kimmel, 1986). Nagel (2017) argues that the differentiated impacts and outcomes of climate change for men and women occur as a result of gender roles, citing examples from climate-related hazards in multiple countries, for example, cyclones, global warming, and sea level rise in Bangladesh, Australia, and the United States. In these countries, societal norms that prescribed how women should act had limited the mobility of women, which heightened their vulnerability.

The already vulnerable situation of Pramuka Islanders in consequence of the physical features (a low-lying and small island) and the current situation of environmental degradation, such as the fish stock depletion, is exacerbated by climate change. Decreased environmental quality can lead to an increased workload for both women and men, as well as an increase in their vulnerability, especially when resources are already scarce (Nelson et al., 2002). It is obviously difficult to separate the factors that are contributing to the declining fish population in Pramuka Island, which is one of the most significant food and income resources for the fishing community. However, climate-related risks have certainly aggravated the hardship experienced by the community from other environmental pressures on the Island.

In response to the falling fish stock, the government initiated a number of interventions to help the fishermen. According to the respondents, these included: developing artificial reefs made from bamboo for fish to grow, introducing new fishing instruments (sonar space, nets, fishing rod, rope), aquaculture, and mangroves plantation. Viewed as a climate change adaptation response, many respondents recognized them as a positive response to the decline in fish resources. But many of them expressed concern that policy implementation and access to benefits

were often discriminatory and inequitable. In addition, in an attempt to increase local communities' resilience to climate change, the local government has also employed a national climate adaptation program, namely the *Program Kampung Iklim* or Climate Village Programme (CVP). The CVP was launched in 2013 to support local villagers in adapting to the impacts of climate change (MoEF1) and includes assisting communities in building vegetable gardens to increase their food security, developing integrated waste management programs to lower carbon emissions, and organizing climate change awareness raising programs in Pramuka Island (SIEA1).

Although such initiatives hold promise, climate change impacts may pose barriers to women's involvement in collective decision-making in environmental governance due to a lack of available time and other constraints. In the context of Pramuka Island, women's multiple responsibilities on the domestic front and their local trading activities to support their families' financial earnings have a knock-on effect on their ability to be involved in community activities, such as village meetings or discussions. Wilkinson and Pratiwi (1995) argue that poor women's greater burdens restrict their ability to obtain information and to contribute to a community forum on environmental decision-making compared to men.

Yet, the significance of community participation in decision-making processes concerning development and environmental management has been generally recognized in the country, including in Pramuka Island. According to a representative of the Ministry of Women Empowerment and Child Protection of Indonesia, one of the opportunities for community participation in policy-making processes is the annual general meeting (or public hearing) where the government discusses its local development plans with communities at village, sub-district, and district levels (MoWE1). These processes aim to open up discussions for the local communities to contribute and share their views on development programs, including those concerning environmental resource management and climate change. Such public hearings and events are required to have at least 30% of their participants from women's groups (MoWE1). However, she acknowledged that it was difficult to ensure this given that even when women were present at such forums, they were not used to the processes and often unable to share their opinion (MoWE1). Such a lack of participation as this official describes is perhaps a reflection of sexist societal norms that devalue women's voices in public forums. It is also evident from this research that women are facing greater pressures on their time from climate change-induced stresses, such as the impact of lower fish catch and destruction of their stalls because of storms. In attempting to fulfill their domestic responsibilities while expanding their paid work of trading, there appears little time to participate in such government-run planning programs.

The absence of women's voices from such forums is a concern, both in terms of the implications for the substantive quality of policies and strategies developed and for its implications for justice. As widely acknowledged in the scholarship, it is critical to ensure the voices of women are present in processes of local environmental governance. Arora-Jonsson (2012), for example, emphasizes the importance of policymakers understanding how locals, especially women, experience and address

environmental change as it helps them avoid epistemic injustice through undermining knowledge produced by the locals, particularly women. The idea of justice is also highlighted by Moosa and Tuana (2014), who argue that the production and reception of climate change knowledge need to value the views of women for better appreciating the ethical dimensions of climate change. This ensures richer understandings of the impacts of climate change from the point of view of the marginalized groups to allow the formulation of more responsive frameworks in addressing climate change.

Local climate adaptation strategies and policies need to incorporate local perspectives from both women and men in the affected society to be effective. Nelson et al. (2002) argue that environmental change has different impacts on women and men, and the responses to these changes need to be gender-aware to prevent government policies and programs from exacerbating gender inequality within society. Government policies, therefore, need to include careful consideration of societal livelihoods and to consider the outcomes of any policy on gender and power relations in order to design strategies for adaptation that are responsive to the interests and needs of local communities (Nelson et al., 2009). Furthermore, MacGregor (2010) points out the urgency for a critical examination of the masculinist discourses underpinning gender and climate politics “that effectively exclude women from positions of leadership and citizenship and given them a choice of much less attractive discursive categories of victims, saviours or culprits” (MacGregor, 2010, pp. 235–236). She argues that ignoring the gendered discourses of climate change will result in unsustainable, unjust, and insufficient responses to address the issue. Thus, in developing a plan for adaptation to climate change risks in Pramuka Island, the consideration of women’s and men’s specific needs and interests, their lived experiences, and the recognition of the centrality of issues of “values, place, power, and narrative” (Munshi et al., 2020) will help develop more suitable and just strategies to reduce the negative impacts of climate change.

5.7 Conclusion

The findings from this study, showing how changes to resource availability and management and seasonal variability had distinct impacts and implications for women and men, are valuable for developing adaptation strategies to deal with climate change risks that are sensitive to local gender needs. The gender analysis revealed that women and men in Pramuka Island are not affected by the risk of climate change in the same manner, given their gender-differentiated forms of employment. For example, the reduction in fish stock over recent years has affected women and men differently with women traders unable to produce and sell fish products in their stalls. Men, on the other hand, have attempted to compensate for the depleting fish stocks by traveling further and spending more time at sea to increase their catch, while also resorting to more harmful fishing practices that negatively affected both their health and the coral reefs. This research also identified the shifts in fishermen’s

fishing practices caused by the changing weather patterns and intensified natural/human-induced hazards. For women, however, these changes in weather affected their ability to sustain their trading activities given the demolition of their stalls during intense storms. Perhaps the most significant aspect of such differential impacts of climate change risks is that with increasing responsibilities to ensure the sustenance of their families, women have less time to participate in public discussions and community-level activities.

This study also provides insight into the complexity of climate change impacts on local communities, as many social factors intersect in shaping the experience of people toward climate change-related risks. There is increasing evidence demonstrating the importance of focusing on local adaptation contexts in addressing climate change issues. By focusing research, policy interventions, and governance more broadly on climate change to the specifics of particular places, we can incorporate the complexity of social structures, cultures, and values that exist within communities. Therefore, when developing climate change adaptation strategies for communities, the views and experiences of local women and men are critical to identifying the most appropriate ways in which to adapt to the changes because women and men often have different roles, values, and knowledge. It is also important to recognize that despite such differences, this research highlighted how climate change impacts affected family units, rather than men and women individually. For example, low fish catch translates to lower volumes of trading, which has implications for the income and economic sustainability of families. So, for climate adaptation strategies to work, men and women have to devise collective strategies. Such strategies require, most fundamentally, policymakers to recognize that meaningful action on climate change calls for systemic change by rethinking traditional, masculinist, and economically informed approaches to development by centering gender and culture in climate change mitigation and adaptation. Ultimately, a commitment by the state to gender equity in political institutions by ensuring women's leadership and participation in democratic governance and policy decision-making at a multifaceted level is critical to creating inclusive and gender-sensitive policies on climate change that are responsive to individuals' and communities' specific needs and interests.

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