

CLIMATE CHANGE AND PROFESSION MIGRATION FLOWS: ECONOMIC AND SOCIAL IMPACTS FOR FISHERMEN IN JEROWARU

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ABSTRACT

Besides, professional migration is coping with the uncertainty of climate change, as many fishers have begun to seek side jobs and even migrate outside the region or abroad in order to seek higher and more stable incomes. Climate alteration alters fish catches; thus, it affects the economic aspect of fishers. Scientific research refers to the impacts of ocean temperature changes and changes in fish migratory patterns as the reasons that affect the availability of marine resources. This paper discusses the climate change and professional change induced within the community of Jerowaru, East Lombok, because of the socio-economic impacts. The fluctuating migration flow and climatic factors are the main factors that influence the socio-economic livelihoods of fishermen in Jerowaru. Most of them migrate to other areas for survival; there is searching for a better source of employment. This profession also came up as an immigrant worker in response to the always deteriorating financial future. Younger family members and most fishermen are migrating abroad and to the surrounding areas due to greater career opportunities. These non-migrating people hardly can switch over to other gainful employments and, for that purpose migrate to lobster farms for work or to gardens in order to start some other high-return businesses. The current research has been performed within 6 months by incorporating qualitative data as well as the case study approach. Data collection was done through participant observation as well as through in-depth interviews and FGDs with documentation.

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1. Introduction

The United Nations Framework for Climate Change Convention (UNFCCC) suggests that climate change has a very broad impact on people's lives. It not only affects the rise of the earth's temperature, but also changes the climate system that affects various aspects of natural changes and human life. The main cause that affects climate change is environmental damage, which ultimately results in a serious threat to human survival, especially the lower classes of society, namely to economic vulnerability and social resilience (UNFCCC, 2022).

A United Nations Environment Programme (2021) report cited that degradation of the environment, including pollution, deforestation, and climate change, falls disproportionately on poor communities with limited access to resources and protection. This is in line with environmental inequality theory which posits that economic well-being is likely to be concentrated among the upper class, while environmental risks are likely to be concentrated among the lower class. For instance, World Bank Report on Climate Change and Poverty (2020) indicated that climate change would push more than 100 million into poverty by the year 2030, and that most of the impacts would be faced by communities residing in and around coastal, low-lying, or disaster-prone areas.

Indonesia, as an archipelago state, is most vulnerable to impact of climate change. According to Central Statistics Agency (BPS, 2020), about 42 million citizens live below 10 meters in elevation (sea level), and most of them have fishermen occupations. For fishermen, direct impact of climate change in coastal areas is an increased risk in venturing out at sea in uncertain weather, such that fishermen will no longer have a chance to go out at sea and will no longer have any source of incomes. In addition, flooding and coastal erosion have a potential in destroying coastal salt fields, coastal shrimp and fish ponds, and reefs, and, in its consequence, coastal communities' productivity will fall down. That is a state that worsens coastal communities' life economically (BPS, 2020).

As an agricultural archipelago, NTB not only has economic potential but also disaster potential due to environmental damage. Based on data from the Indonesian Forum for the Environment (Walhi) NTB (2022-2024) shows that forest destruction in NTB reached 67% or 650,000 hectares from a total area of 1,071,722 hectares. This has a significant impact on natural disasters, such as floods, landslides, abrasion, and extreme weather, and has the potential to cause the sinking of 280 small islands in NTB (Walhi NTB, 2024).

Based on a 2021 National Development Planning Agency (Bappenas) report, loss value in coastal and marine sectors in range 2020-2024 averaged at IDR 81.53 trillion due to climate change. In NTB, coastal communities have started to face the impact of climate change, for example, fishermen in Jerowaru Village, Regency of East Lombok. With variation in changing climate that continues to worsen, being fishermen, the community in Jerowaru started to suffer in terms of having an ability to adapt to impacts of climate change.

Not only fishermen's life in Jerowaru is threatened with having to work at sea, but a career switch is started with a significant drop in earnings and an ever-rising demand for ever-improved life requirements (Bappenas, 2021).

Climate change has impacted fishermen in Jerowaru Village, East Lombok Regency, in terms of life. One of its consequences is a drop in small shrimp yield, a principal raw material for shrimp paste production, a flagship product in the village. Coastal environment degradation forced fishermen to sail deeper at sea for shrimp, increasing shrimp paste production costs and reducing fishermen's incomes (Mongabay Indonesia, 2024). In addition to that, degradation in mangrove forests in the area of Jerowaru even increased coastal environment degradation. Mangroves serve an important role in balancing marine ecosystem and acting as a habitat for a variety of shrimp and fish species. Decline in areas of mangrove forests directly reduces fishermen's yields, then impacting fishermen's welfare economically (Azwari, R.L, et al, 2023).

Stricter economic conditions brought about by climate change have prompted some of the fishermen in Jerowaru to seek alternative sources of income. Some fishermen opt to become migrant workers in foreign countries, such as Malaysia, hoping to receive a better income. Migration also subjects them to social issues, including being away from home and adapting to a new place (Ekuatorial, 2022). Climate change is also affecting Jerowaru's coastal communities' food security. Fish and shrimp catches' declines not only affect income, but also protein sources for fishing communities' households. This subjects individuals to vulnerability and nutrition as well as health problems, especially among children (Novianti, K., 2016).

Therefore, this study seeks to examine climate change and professional migration flows as a result of economic and social impacts for fishermen in Jerowaru with the intention to provide an analysis of the impact of climate change on the fisheries sector in Jerowaru, examine the drivers and impacts of professional migration of fishermen, and explore social changes due to professional migration. With a comprehensive understanding, it is expected that adaptive and sustainable policy recommendations can be formulated to improve the welfare of coastal communities in Jerowaru.

2. Literature Review

Climate change impacts fishermen immensely in terms of reduced yields and susceptibility to extreme weather (IPCC, 2021). Traditional fishermen have no proper mechanism for forecasting weather, and productivity and uncertainty in terms of finance suffer (Kusumawati & Rimmer, 2019). Reduced yields and fisheries governance controlling access to marine produce have an impact (Adrianto et al., 2018).

This professional migration creates mixed social and economic impacts. On one hand, diversity in occupations can increase fishermen's incomes and make them less dependent on fisheries economy. On a counter part, such changes produce social inequality and can lead to loss of coastal communities' identity (Cinner et al., 2018).

* The local context of fishers in Jerowaru shows that they face growing economic pressures due to competition and declining catches (Susilowati et al., 2020). Many have turned to other sectors such as agriculture and construction, although limited skills and access to resources remain key challenges (Yulianti & Setiawan, 2021). Therefore, alternative economic empowerment policies and skills upgrading for fishers are needed to ensure their welfare in the future.

3. Data and Research Methods

The research design used in this study is qualitative with a case study approach. This design allows researchers to explore the dynamics of climate change and professional migration flows as economic and social impacts for fishermen in Jerowaru. This research also applied triangulation of data sources by exploring the truth of certain information through various methods and sources of data acquisition (Creswell and Miller, 2010).

This research was conducted in Jerowaru Village, Jerowaru District, East Lombok Regency, West Nusa Tenggara. This research was conducted for 6 months with data collection techniques through participant observation, in-depth interviews, FGDs and documentation. The sample in this study used 30 informants consisting of the Village Government, Fishermen, Community Leaders, and the General Public. The data analysis technique used in this research is qualitative analysis to process and analyse the collected data into systematic, regular, structured, and meaningful data.

4. Finding and Discussion

In many coastal areas, including Jerowaru, professional migration is a strategy to cope with the uncertainty caused by climate change. Many fishers are turning to side jobs or even migrating outside the region or abroad in search of a more stable income (UNDP, 2021). Climate change affects fish catches, which in turn affects fishers' economies. According to scientific research, changes in ocean temperature and fish migration patterns are the main factors affecting the availability of marine resources (FAO, 2020). This causes fishers to experience difficulties in obtaining consistent catches.

Social Impacts of Climate Change and Professional Migration Flows

Most of the youth fishermen in Jerowaru, in view of Mustih Aman and Mrs Zulhamdani, have started emigrating to Malaysia or taking alternative occupations in a quest to earn a living for their family. In view of Mustih Aman, he initiated searching for alternative occupations in a quest to fund life expenses, including school expenses for children, that cannot be sustained through fishing (Aman, 2024). Theory of social mobility holds that financial uncertainty and sole reliance in a single career can compel an individual to change jobs in a quest for a guaranteed source of living (Castles, 2010). It, therefore, creates migration in response to changing social and financial circumstances (Castles, 2010).

These struggles have changed the way fishermen work. Most of the local fishermen have opted for a new approach to livelihood, such as lobster farming or even farm laborers.

According to Burhan (2024), the women also take part in managing the family economy as farmers or craftsmen. Livelihood diversification in response to uncertainty is a common adaptation strategy in communities exposed to external risks. As part of an economic resilience strategy, diversification allows fishing families to be less dependent on a single source of income (Ellis, 2000).

More frequent and unpredictable changes in climate may increase uncertainty in the lives of fishers and accelerate the stream of professional migration in a coastal village like Jerowaru. Extreme weather, irregular rainy seasons, and high sea waves will directly influence the yield of fish that is the main source of livelihood among coastal communities. This condition turns most fishermen into seeking other ways of livelihood, such as emigration or trying other sectors in the labor market.

This trend also corresponds to the findings of McLeman (2014) that climate change, through uncertainty in marine catches, can be a trigger for out-migration by coastal communities in search of more stable livelihoods. Many villagers from Jerowaru migrate abroad, especially to Malaysia or Middle Eastern countries, in search of higher incomes to support their family's survival. As found by Mustih Aman, people experiencing difficulties in survival do decide to choose the course of migration, particularly the young people, as an effort to get out from the poverty trap (McLeman, 2014). People usually doing migrating jobs as a construction labourer or domestic worker abroad that offers them more salary compared to working as a fisherman.

These migration flows are also not only fuelled by economic factors but also by social changes brought about by the uncertainty of marine products. Such migration results in structural changes and altering patterns of family life. In Jerowaru, one such impact of migration was a shift in the role performances within the family. The migrants start becoming the backbone of the family, while the ones who stay behind at home learn to put up with a lesser and less stable source of income.

A more concrete example is the statement of Mrs. Mus, who firmly refused if her husband had to return to migrate. "I don't want to let my husband go overseas. He is old, we work here, we live and die together at sea," said Ibu Mus. This view shows the tension between the desire to stay in the homeland and the need to migrate to improve economic conditions. At the same time, other families consider migration an avenue of betterment in their economic life despite its costs in terms of social and cultural change. Here, loyalty to the fishing profession and residence location becomes a big dilemma.

The migration of professionals also affects the young generation in Jerowaru. In most families of fishermen, children are obliged to continue their parents' tradition, while a lot of them are now taking a closer look at different opportunities that either tourism can offer them or even building skills abroad. This corroborates the findings of McLeman's 2014, in which climate change was often observed to push the young population toward adapting to more stable jobs and moving away from reliance on sectors susceptible to the impacts of climate change.

Not all impacts brought about by migration and climate change, however, are adverse. To some, these changes represent opportunities for an improved quality of life and enhancement of individual capabilities. For instance, Ibu Naga shared that while her husband is a fisherman,

he also farms rice and tobacco so that they will have a more diversified income. "Currently, he is doing rice and tobacco farming; at most, when he is doing rice farming, he goes fishing," Ibu Naga said, meaning job diversification is not limited to capture fisheries sector only but also sectors that have potential to provide income.

Adaptation Patterns and Social Resilience Strategies of Jerowaru Community

The changes in climate have really altered the social and economic setup of the communities along the coast. A recent study shows that those communities which relied originally on fishing as a source of livelihood are finding it difficult to sustain because of changes in the marine environment. The occupation diversification and hence migration have occurred in the rest. These changes immediately impact the pattern of social interaction. Often, for example, generational or inter-generational period tensions will build since a younger family generation would likely tend to look toward adjustment elsewhere other than remaining with the traditional occupation as fishermen, while a generally older segment might. It may also trigger value conflicts and cultural shifts in coastal communities (Fahmi, et al., 2023).

The uncertainty associated with marine products has also pushed the community into looking for sustainable sectors of employment. According to Burhan, many fishermen in his community are turning to farming lobsters and other forms of aquaculture, which for them is better, more promising, and easier to sell to the market. McManus et al. (2017) also suggested diversifying livelihood sources-for instance, Burhan-as the most probable adaptation strategy that would ensure increased resilience toward climate change-related impacts on the economic aspects of a coastal community. Those who solely depended on marine catch in earlier times now venture to further sectors that receive less effect or impact due to changes in weather or any seasonality.

Some of the respondents noted that professional migration and shifting employments brought about changes in the way of life, further influencing family and social structures. For instance, Mrs. Mus cited that despite her husband wishing to continue with sea work, there was an increasing question over hazardous conditions for the young generation (Mus, 2024).

However, while diversification has been an option, weather uncertainties remain a huge challenge for these fishermen. It is also agreed by Mr. Reni himself, where they cannot go into the sea in bad weather or during big winds. "We can't fish, we just sit at home, we can't do anything," he lamented, depicting how bad weather can hamper their mainstay. This inability to go out to sea on certain days reduced their catches and, therefore, their income, perhaps causing tensions in the family, especially when daily needs must still be met despite unstable fish catches.

The social transition theory, as noted by Hughes, 2009, focuses on how external factors such as climate change bring about a variation in the social and cultural trend of individuals. Adaptation patterns within the Jerowaru community, therefore, that depend on local resources and collective strategies in order to deal with the impacts of climate change and professional migration flows. One common adaptation measure is livelihood diversification.

However, job diversification is not a panacea that is free from challenges. Besides dependence on natural factors that continue to affect business results, limited access to markets and capital are also obstacles that need to be faced by the community. For this reason, it is important that cooperatives of fishermen or business groups in partnership be established in order to give training, market access, and capital as ways to strengthen social resilience. The various empowerment programs that involve collaboration among the government, NGOs, and local communities-especially those being conducted by local organizations-can amply strengthen the sustainable social and economic networks.

Besides economic diversification, the patterns of social adaptation are also known from how the community of Jerowaru maintains the social and cultural values that bind them. Attachment to tradition and values of collectivity are considered important social capital to face the challenges of climate change. Equipped with gotong royong and strong social networks, the Jerowaru community is able to help each other face the crisis caused by climate change and professional migration.

Challenges and Potential Policy Improvements

Whatever multiple forms of adaptation this community undertakes, not least Colonia Jerowaru still faces numerous challenges, especially infrastructural and policy-wise, among others. In fact, other economic activities such as lobster farming or tourism may urgently require adequate infrastructural support to enhance competitiveness and raise income levels within the community. Equally important are other policies responsive to local conditions, such as skills training programs, community-based economic empowerment, and social protection for migrant workers.

Government and social institutions also have an important role in supporting coastal communities given both impacts of climate change and professional migration. It requires formulating more targeted policies that support the economic diversification efforts of fishers and provide social protection for those who migrate. For instance, the various government initiatives in support of the fisheries industry may be considered to reduce dependence on highly volatile catches of marine life. This introduces more friendly nature-based economic alternatives. This is in line with the recommendations by the World Bank, 2018, in suggesting that policies for coastal communities should enhance social resilience by strengthening economic capacity based on sustainability.

Nevertheless, inequality still characterizes the poor performance of the fulfilment of basic needs of fishermen. Despite the implementation of various policies through social assistance or subsidies by the government, their distribution is oftentimes unequal. The holistic and community-based approach to address these difficulties faced by fishing communities has to be improved, including in capacity building at the community skill level and in local economic sustainable empowerment. According to Bene et al. (2016), community empowerment is required on ways to respond to the changing climate, amidst support by appropriate policy that

makes the resources and technologies available and accessible for the purposes of supporting adaptation.

Climate change and professional migration are other contributing factors to the complexity of social impacts in fishing communities within Jerowaru. Uncertainty about sea catches, the impacts of extreme weather, and low income have pushed people in coastal communities to look for alternative jobs through migration or occupational diversification. Migration has an impact on the social structure, such as family and community, which are shifting roles and relationships. On the other hand, diversification in economic and occupational sectors has increasingly become an avenue for adaptation toward enhancing social resilience. Therefore, resilient support for coastal communities will require policies that encourage economic diversification and provide greater access to resources to support adaptation to climate change.

5. Conclusion

From this discussion, it is seen that in Jerowaru, variations in the flux of migration flows and climate factors are major in influencing the socio-economic livelihoods of fishermen. In fact, several climate change phenomena, such as erratic weather, wave height, and increased wind, have disrupted fishermen's fishing activity and further led to increasing income uncertainty. Subsequently, most of them migrate to other areas for survival, seeking different employment opportunities. Professional migration is a response to increasingly darker financial realities, as well. Younger family members and most fishermen migrate abroad and even to nearby areas in search of brighter career prospects, and even for those not emigrating, an attempt is made at transitioning towards a career change, such as a transition towards lobster farm work, farm work, or starting alternative more profitable ventures.

Dependence in an increasingly insecure environment is a challenge for fishermen long having lived with an unpredictable work schedule. To that, social trends in fishermen's lives also represent a values and role transformation for coastal communities, who in the past exclusively depended on the marine economy but increasingly build alternative assets and capabilities in an attempt to promote family financial security.

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