Fisherman Community Development Model with Disaster Mitigation Perspective in Meranti Islands Regency

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Abstract. Meranti Islands Regency has coastal natural resources. On the other hand, this area also has the potential for natural disasters (coastal) and non-natural disasters that threaten the sustainability of resources and community welfare, so disaster mitigation efforts are needed. This study aims to formulate a model for developing Fisherman communities with a disaster mitigation perspective. This study uses MPE analysis and prospective analysis. The strategic basis for developing fisherman communities is increasing food security through the developing coastal based green industries, capacity building for local competitiveness and conservation of endemic species, and allocating budget proportionally to create local-based economic infrastructure and facilities development. The potential natural disasters that are more dominant in Meranti Islands Regency are abrasion, landslides, high waves and tidal flooding. A non-natural disaster is Covid-19 pandemic. Mitigation must be done is planting mangroves, building sheet piles, social engineering policies must be done by planting mangroves, building sheet piles, social engineering policies, and planting mangroves, building sheet piles, social engineering policies, and alternative livelihoods. The model for developing Fisherman communities with a disaster mitigation perspective in Meranti Islands Regency is optimizing coastal areas' productivity and livelihood support systems.

1. Introduction

The phenomena of development and disasters are in line with formulating regional policies, both nationally and regionally as efforts for sustainable development [1]. The coastal area of Meranti Islands Regency ecologically has characteristics and potential for natural disasters such as abrasion, landslides, high waves and tidal flooding and several other threats [2]. Therefore, the management of the potential of natural resources, human resources, capital resources, technology and management as inputs for the production of economic activities in development programs, especially Fisherman communities, needs to consider the risk of these disasters.

2. Methods

2.1. Sources of Information

This research was conducted on the coast of Meranti Islands Regency, Riau Province, Indonesia. The study locations are in 4 sub-districts in Meranti Islands Regency, namely Merbau District, Ransang
Pesisir District, Tebing Tinggi District, and East Tebing Tinggi District. The basis for selecting the study location is that the research object areas can represent other coastal areas in the Meranti Islands Regency based on their geographical position and regional characteristics.

The research was conducted from May to August 2021. The data used in this study were primary and secondary. Primary data was obtained from the results of field surveys through 40 key informants, while secondary data was obtained from publications and literature of relevant scientific works.

2.2. Data Analysis
The Exponential Comparison Method (MPE) is one of the methods of the Decision Support System (DSS) which is used to determine the priority order of decision alternatives with multiple criteria [3]. The prospective analysis is used to develop a model for developing fisherman communities with a disaster mitigation perspective. The use of prospective analysis is to prepare strategic actions that need to be taken and see if changes are needed in the future [4].

3. Result and Discussion
The approach to formulating a model for developing a fisherman community with a disaster mitigation perspective also pays attention to sustainable development. The first step in preparing the formulation is to create a model framework (Figure 1). The model framework is formulated by considering various key development factors. Decision-making models and methods can be assessed systematically with the proposed framework [5].

![Figure 1. Decision-Making Model Diagram](image-url)

Decision-making models become the right tool for strategic decision-makers in various complexities and time pressures [5]. Based on expert discourse, the criteria for developing a fisherman community with a disaster mitigation perspective are obtained, socio-economic, technological, health environmental aspects & disaster mitigation. Actors, namely the Fisheries Service, Environmental Service, BPBD, Social Service, Central Government, Fishermen's Groups, Village Heads/Lurah, NGOs and business actors. In the next stage to determine alternative fisherman community development strategies (Figure 2) and alternative disaster mitigation strategies (Figure 3).
Based on the MPE analysis, the alternative strategy for developing fisherman communities is a program to increase food security by developing a coastal-based green industry (score 35). The development of green industry in the Meranti Islands district is adjusted to the regional typology [6]. The second alternative is capacity building for local competitiveness and conservation of endemic species (score 32.5). Local competitiveness focuses on improving the skills of human resources, especially the fisherman community. In addition, the conservation of endemic aquatic resources needs to be pursued. The third alternative is the development of local-based economic infrastructure and facilities (score 32.5). Infrastructure development in the Meranti Islands Regency is a lever factor in regional economic development, especially fisherman communities; this can be seen from the limited infrastructure supporting local economic activities.
Alternative disaster mitigation strategies in the Meranti Islands Regency include mangrove planting/rehabilitation (score 35). The condition of mangroves in the Meranti Islands Regency has been degraded. Damage to the mangrove forest ecosystem is caused by various human activities such as industrial activities, tree cutting and coastal abrasion. Rehabilitation efforts need to be made to preserve the mangrove forest [7]. Second, social engineering policies (score 35), third, construction/protection of sheet piles (score 32.5), and fourth, alternative livelihoods (score 32.5).

The formulation of the fisherman community development model with a disaster mitigation perspective in the Meranti Islands Regency was determined through a prospective analysis. The prospective analysis in this study is based on the synthesis of alternative fisherman community development strategies and alternative disaster mitigation strategies. The model for developing fisherman communities with a disaster mitigation perspective in Meranti Islands Regency is optimizing coastal areas' productivity and livelihood support systems.

4. Conclusion

Policy makers persist in their attempts to predict the future natural events (disasters) often involve a fundamental element of uncertainty [8]. Based on the research findings, the fisherman community development model with a disaster mitigation perspective in Meranti Islands Regency is coastal areas' productivity and livelihood support systems. The strategic stages of developing fisherman communities are to increase accessibility, facilities and infrastructure to support economic activities and improve community capabilities in digital marketing. The strategic stages of disaster mitigation are empowering coastal communities in terms of disaster mitigation, revising coastal spatial plans and their arrangement by considering mitigation aspects and providing data, hazard maps and risk assessments.

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