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ANALYSIS OF THE IMPLEMENTATION OF FLOOD PRE-DISASTERS MITIGATION POLICIES IN PRODO VILLAGE, PASURUAN REGENCY

Bella Ayu Sherlyta Permata Sari [a*)], Dra. Sri Wibawani [a)]

[a)] *UPN "Veteran" Jawa Timur, Surabaya, Indonesia*

[*)]*Corresponding Author: 21041010217@student.upnjatim.ac.id*

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Abstract. High frequency and impact of flooding require systematic management, as outlined in regulations. This study aims to analyze and describe implementation of pre-disaster flood mitigation policies in Prodo Village, Pasuruan Regency. The research method uses qualitative descriptive approach with focus on Smith's implementation theory Dr. H. Tachjan. 1. Idealized policy; 2. Target group; 3. Implementing organization; 4. Environmental factors. With Data collection techniques through observation, interviews, documentation. Research results: 1. Implementation of flood mitigation policies is organized with planning and risk analysis. Adequate infrastructure, prevention based on mutual cooperation culture, spatial planning supervision, preparedness training. However, information expansion and coordination are needed 2. RDMA employees, village officials, volunteers, and the main target community build strong public-private partnerships, although attention to vulnerable groups needs to be increased 3. RDMA and village governments play a role in policies, training, and facilities to improve preparedness and self-empowerment 4. Culture of mutual cooperation, social solidarity, agricultural economy, and political aspects support the success of mitigation. The conclusion of this study is: Flood mitigation policy is implemented systematically with ongoing planning, risk reduction, prevention, spatial control, and education. RDMA, village government, volunteers, and community collaborate, forming strong public-private partnerships. RDMA and village officials enhance community preparedness, self-empowerment, program sustainability. Social, economic, cultural, political environment fosters solidarity and shared responsibility, making mitigation a collective effort supported by strong institutional coordination and community participation. has maintained a unity that interacts with each other in the Implementation of Pre-Flood Disaster Mitigation Policy in Prodo Village, Pasuruan Regency.

Keywords: Disaster Mitigation; Environment,Interaction Patterns; Implementing Organization; Target Group.

I. INTRODUCTION

Flood disasters remain one of the most frequent and destructive natural hazards worldwide, causing significant social, economic, environmental, and humanitarian losses, particularly in developing countries with high population density and limited adaptive capacity [1], [2]. Climate change, land-use transformation, and rapid urbanization have exacerbated flood intensity and frequency, making disaster risk reduction (DRR) a critical global agenda [3], [4]. International frameworks such as the Sendai Framework for Disaster Risk Reduction 2015–2030 emphasize the importance of proactive, preventive, and community-based mitigation strategies to reduce disaster risks before hazards occur [5].

Indonesia is recognized as one of the most disaster-prone countries due to its geographical, climatic, and geological characteristics. Situated at the convergence of major tectonic plates and within a tropical monsoon climate zone, Indonesia experiences high rainfall variability that frequently triggers floods and extreme weather events [6], [7]. Empirical evidence indicates that floods consistently rank as the most recurrent disaster type in Indonesia over the past decade, surpassing earthquakes, landslides, and droughts in both frequency and spatial coverage [8]. These conditions necessitate systematic, integrated, and policy-driven disaster management approaches at national and local levels.

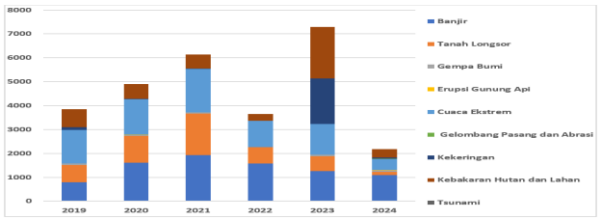

Figure 1. Disaster Events in Indonesia 2019-2024

In response to escalating disaster risks, the Indonesian government has strengthened its disaster governance framework through Law No. 24 of 2007 on Disaster Management, which emphasizes mitigation, preparedness, emergency response, and recovery as an integrated cycle [9]. Pre-disaster mitigation, in particular, is positioned as a strategic

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phase aimed at reducing vulnerability and exposure through physical development, spatial planning control, institutional coordination, and community capacity building [10]. Subsequent regulations, including regional and sectoral policies, further operationalize mitigation principles at sub-national levels to address localized hazard characteristics.

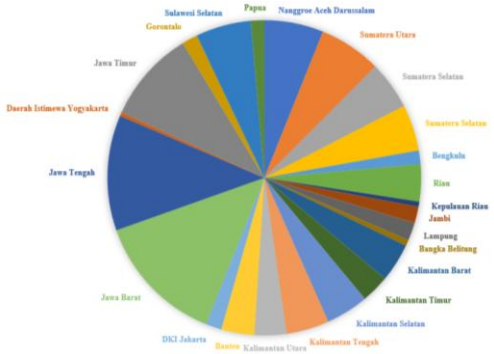

Figure 2 Flood Disaster Events in Indonesia by Province in 2019-2024

The data above shows that in the past year, namely 2024, East Java had the highest number of floods on the island of Java. Data from the National Disaster Management Agency shows that East Java reached 100 flooding incidents.

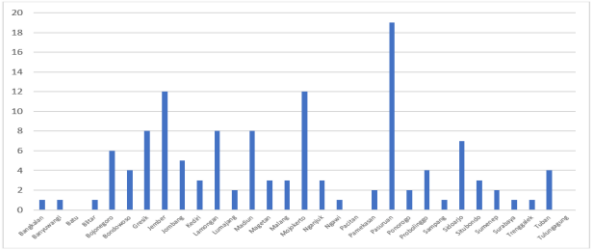

Figure 3 Frequency of Flood Disasters in East Java in 2024

Of the many regions in East Java, Pasuruan Regency is highly vulnerable to flooding due to its geographical location, dominated by alluvial lowlands and crossed by the Rejoso and Kedunglarangan River Basins. The frequency of flooding in Pasuruan Regency is also considered the highest compared to other regions. In 2024, there were approximately 19 floods spread across numerous locations in Pasuruan.

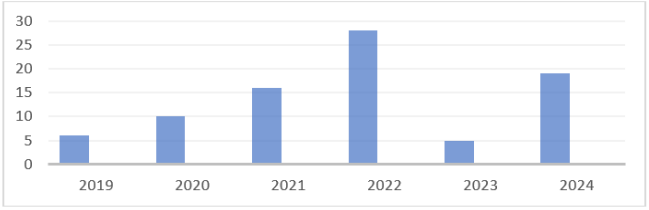

Figure 4 Frequency of Flood Disasters in Pasuruan 2019-2024

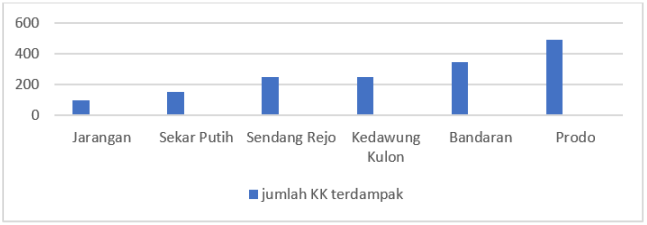

Figure 5 Frequency of Flood Disasters in the Pasuruan Region in 2024

Based on the data above, the area in Pasuruan that experiences quite severe flooding and occurs annually is Prodo Village, with 490 families affected in Winongan District. Floods not only cause significant material losses but also threaten lives and disrupt community activities.

East Java Province represents one of the regions with the highest flood incidence in Indonesia, driven by extensive river networks, alluvial lowlands, and intensive agricultural land use [11]. Within this province, Pasuruan Regency is classified as a high-risk flood area due to its hydrological conditions and settlement patterns along river basins [12]. Annual flooding in several sub-districts has caused repeated economic losses, infrastructure damage, and social disruption, underscoring the urgency of effective pre-disaster mitigation policies tailored to local contexts.

Prodo Village in Winongan District exemplifies a rural area with chronic flood exposure, where flooding occurs almost annually and affects hundreds of households. Beyond material damage, floods in Prodo Village disrupt agricultural productivity, threaten livelihoods, and increase health and safety risks for vulnerable populations [13]. These recurring impacts highlight the limitations of reactive disaster response and reinforce the need for preventive, participatory, and policy-driven mitigation mechanisms.

The effectiveness of disaster mitigation policies depends not only on regulatory design but also on how policies are implemented at the grassroots level. Policy implementation studies emphasize that gaps frequently emerge between formal regulations and actual practices due to institutional capacity constraints, coordination failures, and socio-cultural dynamics [14]. Smith's policy implementation framework, which examines idealized policy, target groups, implementing organizations, and environmental factors, provides a comprehensive analytical lens to assess how mitigation policies operate in real-world settings [15].

Previous studies on disaster mitigation in Indonesia have largely focused on technical risk assessment, infrastructure development, or emergency response mechanisms [3], [8]. However, fewer studies systematically analyze the interaction patterns among implementing agencies, local governments, community groups, and environmental contexts during the pre-disaster phase, particularly at the village level. This gap limits understanding of how local governance structures and social capital influence mitigation effectiveness.

Therefore, this study aims to analyze and describe the implementation of pre-disaster flood mitigation policies in Prodo Village, Pasuruan Regency, using Smith's

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implementation theory as an analytical framework. By examining policy design, stakeholder interaction, institutional roles, and environmental factors, this research contributes empirical insights into localized disaster governance and offers policy-relevant recommendations to strengthen community-based flood mitigation in disaster-prone rural areas..

RESEARCH METHODS

This study uses a descriptive qualitative approach to provide comprehensive information regarding the implementation of pre-flood disaster mitigation policies in Prodo Village, Pasuruan Regency, with a focus on Smith's implementation theory [15] These are idealized policy, target groups, implementing organization, and environmental factors. Data were collected through observation, interviews, and documents, using purposive sampling. Data analysis was conducted using an interactive model through the stages of data collection, data condensation, data presentation, and conclusion drawing/verification.

II. RESULTS AND DISCUSSION

The implementation of pre-flood disaster mitigation policies in Prodo Village, Winongan District, Pasuruan Regency, is based on Regional Regulation No. 4 of 2011, which establishes an integrated and sustainable mitigation framework. This policy is implemented through several key, interrelated steps to minimize the risk and impact of flooding.

First, disaster management planning is carried out systematically and involves all stakeholders, from village governments, the Regency Regional Disaster Management Agency, volunteers, and the community. Contingency plan documents are prepared periodically, incorporating comprehensive risk analysis. The plans are not static but are regularly evaluated and disseminated through village meetings to ensure their relevance and preparedness for all parties.

Second, disaster risk reduction focuses on the development of physical infrastructure such as embankments, river normalization, and drainage channels, which are maintained sustainably with the support of the Regional Disaster Management Agency. The existence of a disaster risk reduction forum encourages active community participation in environmental monitoring and preservation, demonstrating collective awareness of the importance of mitigation.

Third, prevention includes strict monitoring of land use and spatial planning, as well as public education campaigns to maintain environmental cleanliness and avoid practices that increase flood risk. Local cultures such as mutual cooperation and generosity are maintained and utilized as social capital to empower communities in protecting the environment and anticipating disasters.

Fourth, guidance in development planning, including the integration of disaster risk mitigation into planning documents such as the Medium-Term Village Development Plan and Village Government Work Plan, ensures that all development takes potential flood risks into account and enhances overall village resilience. This includes prioritizing environmentally friendly and mitigating development.

Fifth, the implementation of risk analysis requirements is carried out through participatory engagement with residents and village officials. Collecting risk data, creating evacuation route maps, and identifying disaster-prone zones provide a valid basis for designing mitigation strategies. The main challenge is limited human resource capacity and technology, which need to be strengthened to ensure more accurate and comprehensive risk analysis.

Sixth, the implementation and enforcement of spatial planning are essential foundations for mitigation. Regulating village spatial use in accordance with the RTRW (Regional Spatial Plan) and strict oversight by village governments and relevant agencies ensure that development does not exacerbate flood risks. Administrative sanctions and public education are part of sustainable spatial planning enforcement.

Seventh, regular preparedness education and training should improve the capacity of communities and village officials. Programs involving evacuation simulations and hands-on risk assessments enhance community preparedness. However, expanding the reach of training, particularly for housewives and vulnerable groups, remains a critical requirement.

Eighth, the technical standard requirements for mitigation infrastructure development are accompanied by continuous monitoring by the Regional Disaster Management Agency. Regular maintenance is carried out to ensure facilities such as embankments and drainage channels are functioning effectively, although resource constraints mean that maintenance intensity is less than optimal.

Regional Disaster Management Agency employees, village government officials, local volunteers, and the community, as the target groups most directly impacted by this policy, have adopted this interaction pattern and built strong public-private participation and partnerships as the foundation for successful mitigation. The involvement of all parties strengthens response capacity and the cross-sector communication and coordination networks crucial in disaster emergencies. Active participation in training, outreach, and risk management supports the integration of mitigation measures, although specific attention to vulnerable groups remains inadequate, leaving them at high risk during disasters.

The Regional Disaster Management Agency and Village Governments play a significant role in providing protection through policies, regulations, technical guidance, facilities, and training that enhance community preparedness and rapid response capabilities. This policy encourages community empowerment to be more independent and responsive, reducing the burden on the government and ensuring the sustainability of mitigation efforts.

The economic and social environment influenced by this policy creates a peaceful atmosphere, allowing communities to focus on socio-economic development and quality of life without the fear of disaster risks. This social stability contributes to social cohesion and community well-being. Cultural and political aspects also support a spirit of mutual cooperation and generosity among residents, with respect for local culture and wisdom as social capital that strengthens

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social networks and community solidarity. This spirit encourages inclusive and responsive collaboration that maintains traditional local values, making disaster mitigation a shared responsibility, not just the government's.

III. CONCLUSIONS

Ideal interaction patterns in the implementation of pre-flood disaster mitigation policies in Prodo Village are systematically implemented through ongoing planning involving the village government, the Regional Disaster Management Agency, volunteers, and the community. Contingency planning documents and risk analyses are periodically developed and disseminated through village meetings to ensure preparedness. Risk reduction focuses on the construction and maintenance of physical infrastructure such as embankments and drainage channels, supported by active community participation through risk reduction forums. Prevention is carried out through spatial planning supervision and environmental education based on a culture of mutual cooperation and generosity. Integrating mitigation into village development planning documents ensures that development takes disaster risks into account, with community participation in risk data collection and evacuation map creation. The Regional Disaster Management Agency routinely implements and enforces spatial planning and technical standards for infrastructure supervision. Preparedness education and training are held regularly, although expanded outreach to vulnerable groups is still needed. Cross-sector synergy creates a strong community resilience system, but limited resources, uneven information distribution, and the need for increased inter-agency coordination are key challenges to the sustainability of mitigation in Prodo Village. The main target groups consist of Regional Disaster Management Agency employees, village officials, local volunteers, and affected communities who build strong public-private partnerships, strengthen response capacity and cross-sector communication and coordination networks, although special attention to vulnerable groups is still inadequate. The main implementing organization is the Pasuruan Regency Regional Disaster Management Agency, supported by village governments and local volunteers, with the role of coordination, technical guidance, monitoring the implementation of mitigation, as well as managing field conditions, patrols, education, and evacuation by volunteers; the main constraints are limited human resources and facilities. Environmental factors such as the culture of mutual cooperation and generosity, social awareness and community solidarity, the dependence of the village economy on agriculture, as well as political and governance aspects support the success of mitigation through strengthening social capital, social cohesion, and inclusive collaboration, making mitigation a shared responsibility not just the government's.

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