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# IMPLEMENTATION OF DISASTER MITIGATION POLICIES IN NATUNA REGENCY (Case Study: Forest and Land Fires in Cemaga Village)

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*Disaster Mitigation,*
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**Abstract**

*Natuna Regency is highly vulnerable to forest and land fire ( Karhutla ) disasters, particularly in Cemaga Village. Disaster mitigation efforts are regulated by Regional Regulation Number 14 of 2019 as a risk reduction measure. However, its implementation still faces several challenges, including limited funding, insufficient resources, low public awareness, and weak inter-agency coordination. This study aims to analyze the implementation of disaster mitigation policies in handling forest and land fires in Cemaga Village, using George C. Edward III's policy implementation theory. A qualitative method was employed, with data collected through interviews and documentation. The findings show that the implementation of Karhutla mitigation policies has not been optimal. Major obstacles include limited resources in terms of budget, equipment, and qualified personnel. Uneven communication hampers the effective dissemination of information to the public. Coordination among relevant agencies—BPBD, DLHK, and the Fire Department—is ineffective, leading to delayed responses during fire incidents. Difficult access to fire-prone locations and inadequate equipment hinder further early response efforts. Moreover, community involvement in mitigation activities remains limited, despite the crucial role of public participation in preventing and managing forest and land fires, especially in high-risk areas such as Cemaga Village.*



## INTRODUCTION

The Riau Islands Province is a region prone to natural disasters, both due to its geographical location on the border of mainland Asia and due to its topography dominated by hills and mountains and a tropical climate with only two main seasons: the rainy season

and the dry season. Based on data from the National Disaster Management Agency (BNPB) through inaRISK (2023), the disaster risk index in this province fluctuated during the period 2015 to 2023, but tended to be stable at 110 to 120. In 2023, the index value was recorded at 107.79, which is classified as moderate.

Natuna Regency, as part of the Riau Islands Province, faces a number of disasters with varying levels of risk, including forest and land fires ( karhutla ), drought, flooding, extreme weather, landslides, and extreme waves. According to the 2020–2024 Riau Islands Disaster Risk Assessment, forest and land fires recorded the greatest impact, with an affected area of 197,083 hectares, of which 38,544 hectares were classified as high risk. Drought affected 198,569 hectares, and flooding affected 134,704 hectares. Thus, forest and land fires, drought, and flooding are the main types of disasters that require attention in mitigation efforts in Natuna Regency.

The table of disaster events in Natuna during 2022–2024 shows that forest and land fires occurred 167 times, affecting 424.35 hectares, categorized as high risk. Droughts occurred six times, affecting 198,569 hectares (moderate risk), extreme weather events occurred 10 times (153,028 ha), and floods occurred 25 times (134,704 ha), both also classified as medium risk. Extreme waves and landslides are categorized as low risk, while flash floods and earthquakes were not recorded and are categorized as very low. This data indicates that forest and land fires are a major threat in Natuna Regency, both in terms of frequency and extent of impact.

In 2024, there was a decrease in the number of disaster events to 87, compared to 91 events in 2023 and 94 events in 2022. Although the number decreased, the frequency of forest and land fires remained high, indicating that this disaster remains a real and serious threat.

Areas vulnerable to forest and land fires include the districts of South Bunguran, North Bunguran, Bunguran Batubi, East Bunguran, Central Bunguran, and West Bunguran. In Cemaga Village in South Bunguran District, fires are often triggered by traditional land clearing through burning. In 2023, East Bunguran District recorded the highest number of forest and land fire incidents, with 55 incidents. In North Bunguran, fires in early 2023 spread to 100 hectares and caused visibility problems due to thick smoke. In Bunguran Batubi, a fire occurred in March 2024 covering an area of five hectares. In general, the main cause of fires in Natuna is a combination of extreme heat and human activity that clears land by burning without adequate supervision.

Data from the Natuna Regional Disaster Management Agency (BPBD) recorded that the number of forest and land fires increased from 53 in 2023 to 80 in 2024, with a total burned area of over 400 hectares. One of the villages with the highest number of incidents is Cemaga Village in South Bunguran District. The village's geographical characteristics include dry land, grasslands, shrubs, and low hills that are prone to fire during the dry season. In addition to natural factors such as hot temperatures and wind, the practice of clearing land by burning also increases the risk of forest and land fires.

mitigation is implemented at various levels, from the individual to the national level. The individual and community levels focus on preparedness and daily behaviors, such as avoiding land clearing by burning, participating in outreach activities, and forming preparedness groups. Local governments are responsible for formulating policies, allocating resources, and coordinating mitigation programs. Mitigation policies Forest and land fires in Natuna are formulated through Natuna Regency Regional Regulation Number 14 of 2019 which includes activities such as outreach, volunteer

training, patrols, provision of firefighting equipment, and coordination between agencies such as BPBD, DLHK, and DAMKAR.

However, the implementation of this policy faces obstacles, including budget constraints, weak inter-agency coordination, and low community participation. In Cemaga Village, for example, despite outreach activities and the formation of volunteers, firefighting facilities are still limited, and most residents still clear land by burning. The geographical and social conditions of Cemaga Village add to the complexity of mitigation. This village has a vast expanse of dry land with a sparse population, and access to firefighting facilities and communication networks is still limited, causing delays in disaster management.

Cemaga Village are known for upholding the value of mutual cooperation, but awareness of disaster risks remains low. Continuous education and mentoring are needed to increase their understanding and active role in mitigation. BPBD data from 2022–2024 recorded 35 forest and land fire incidents in Cemaga Village, making it the village with the highest frequency of forest and land fires in Natuna. These incidents often recur in the same locations, such as Cemaga Hamlet, Jl. Penarik, Jl. Selemut, Padang Hangus, Jl. Setengar, and Jl. Poros Cemaga. The fire area varies, from less than one hectare to 26 hectares, with an estimated total burned area of more than 100 hectares in three years.

Factors contributing to the forest and land fires in Cemaga Village include land clearing by burning and hot and dry weather conditions that facilitate the spread of fires. Burning is often uncontrolled and escalates into forest and land fires. This situation is exacerbated by the lack of management and monitoring facilities.

Natuna Regency Regulation No. 14 of 2019 establishes the government's responsibility to protect the public and reduce disaster risks. However, implementing this policy faces significant challenges. Limited local government budgets hinder the provision of adequate facilities and resources for forest and land fire mitigation. The Ministry of Environment and Forestry (KLHK) has coordinated with the Natuna Regency Government, but without sufficient budgetary support and resources, effective mitigation efforts are difficult to implement.

Coordination between the Environment and Forestry Department (DLHK) and the Natuna Regency Government has been suboptimal. Despite field inspections and the establishment of an integrated command post, issues such as a lack of firefighting equipment and limited personnel remain unresolved. Public awareness campaigns on forest and land fire prevention are ongoing, but awareness is very low. Many residents do not yet understand the threat of fire as a serious risk and tend to ignore warnings against clearing land by burning.

A lack of understanding of the long-term impacts of fires on the environment and public health adds to the complexity of mitigation efforts. Outreach efforts need to be more intensive and involve the community directly to increase awareness and active participation.

In conclusion, Natuna Regency, particularly Cemaga Village, faces a serious threat from forest and land fires. Although mitigation policies have been formulated through Regional Regulations, their implementation has been suboptimal due to limited budgets, weak coordination, and low public awareness. It is crucial to evaluate the effectiveness of these mitigation policies and identify challenges hindering their implementation on the ground.

This research focuses on the local government and community levels. The local government, through the Regional Disaster Management Agency (BPBD), the Environment and Forestry Agency (DLHK), and the Fire and Rescue Agency (DAMKAR), acts as the implementer of mitigation policies in accordance with Regional Regulation No. 14 of 2019, while the community serves as both a partner and a target of the policy. Their involvement in outreach, education, and prevention is a crucial element in the success of mitigation.

Suryanto and Susanto (2018) emphasize that strengthening collaboration between the government, communities, and relevant institutions is the primary solution to overcoming obstacles to disaster mitigation implementation. This collaboration will enable resource optimization and increase policy effectiveness.

This study aims to analyze the implementation of disaster mitigation policies in Natuna Regency in response to forest and land fires in Cemaga Village, and to identify the obstacles faced by both the local government as implementer and the community as partners. These findings are expected to provide theoretical contributions to the development of disaster policy literature and practical benefits in the form of recommendations for improvements for local governments.

## REVIEW LIBRARY

This section discusses the literature review, which includes a theoretical framework, a conceptual framework, and conceptual definitions. The primary purpose of the literature review is to provide a comprehensive overview of relevant prior research, thereby helping researchers understand theory and previous findings, identifying gaps in existing studies, and demonstrating the contribution this research will make. Within the context of this research, several prior studies serve as important references.

Research by Jefesen Pahar Erichat (2022) examined fire mitigation efforts in densely populated coastal residential areas of Tanjungpinang City by the Fire and Rescue Service. Using a qualitative descriptive method and a mitigation theory approach encompassing structural and non-structural dimensions, this study found that firefighting equipment capacity was inadequate, the physical environment was highly fire-prone, the community had not renovated buildings enough, and accessibility for firefighting vehicles had not been reconstructed. Furthermore, there were limited competent personnel resources, as well as high social and economic vulnerability of the community, so that mitigation efforts were not optimal.

Meanwhile, research by Putri (2022) examined the role of the Regional Disaster Management Agency (BPBD) in handling flooding in Teluk Air Village, Karimun District. This study showed that the BPBD was well-prepared and engaged community participation, particularly in maintaining the cleanliness of waterways. However, limited human resources, low public awareness, and natural factors were the main obstacles in carrying out BPBD's duties.

Another study by Diov Hafizh (2022) focused on the role of the Riau Islands Province Regional Disaster Management Agency (BPBD) in disaster management, specifically in handling the tornado in Karimun Regency. The BPBD, through its emergency and logistics division, immediately distributed basic food aid, and the study results indicated that the BPBD's implementation of its duties was quite optimal. However, the uncertainty of the disaster's location and timing remains a major challenge.

Turning to the theoretical framework, this section explains the theories that serve

as the conceptual basis for the research. The theoretical framework serves as a tool for interpreting data and developing a framework for thinking. According to Nang Martono in Priadana and Sunarsi (2021), theory can connect one study to another and help researchers explain the relationship between previous research and the current one. In this context, theories of policy implementation and disaster mitigation are central to the theoretical study.

Policy implementation is defined as the process of carrying out policies designed by the government to achieve stated objectives. Nugroho (in Laary F. and Dengo, S., 2022) emphasizes that implementation is a tool to ensure policies are implemented according to their objectives. Meanwhile, Jones (in Laksana, 2023) states that implementation is relatively easy as long as there are adequate implementers, funding, and organizational capacity (Kusumasari, 2012) . Yulianto Kadji ( in Nugraha, 2021) emphasizes the importance of structured coordination of steps, while Laster and Stewart (in Laksana, 2023) emphasize the importance of structured coordination of steps. Putra (2022) views it as a legal administrative instrument involving actors, organizations, and procedures in achieving policy objectives. Furthermore, Yulianti, in Basuki (2022), explains that implementation also includes efforts to influence the behavior of bureaucrats and target groups to act in accordance with established policies.

George C. Edward (in Wati, 2022) states that the success of policy implementation is determined by four main variables: communication, resources, disposition, and bureaucratic structure. Communication plays a crucial role in ensuring the implementers understand the objectives and content of the policy. Without a clear understanding, policy implementation will deviate from its original intent. Resources, including human resources, funding, and information, are also essential to ensure success. Disposition refers to the implementers' attitude and commitment to the policy. Finally, an overly rigid or complex bureaucratic structure can hinder effective implementation.

Another model was proposed by Donald Van Meter and Carl Van Horn in (Kasmad, 2013) , which includes six important variables: policy standards and objectives, resources, inter-organizational communication, characteristics of implementing institutions, socio-economic-political conditions, and attitudes of policy implementers. Meanwhile, Mazmanian and Sabatier in (Abdoellah Y., 2016) highlighted the importance of ease of problem control, formulation of the implementation process, and political influence on implementation support.

Furthermore, disaster mitigation is defined as efforts to reduce the negative impacts of disasters, whether caused by nature or humans. Mitigation measures include planning, strengthening infrastructure, and increasing public awareness. Giri in (Widiyawati, 2023) emphasized that mitigation is a sustainable effort, while Wijanarko in (Juhadi and Herlina, 2020) emphasized the importance of distancing settlements from vulnerable areas. Law Number 24 of 2007 states that mitigation includes physical development and increasing capacity to face disasters (Martinus S. and Rico, P., 2020). Alfin and Abdul in (Yusnita, 2024) added that mitigation is carried out before a disaster occurs and includes outreach and strengthening community capacity. This is also emphasized in Government Regulation Number 21 of 2008 (Satibi, 2011) .

According to Home Affairs Ministerial Regulation Number 33 of 2006 (Nakoe NAS, 2022) , there are four important aspects in disaster mitigation : providing information and maps, public outreach, understanding self-rescue, and structuring vulnerable areas. These steps are crucial in building awareness and preparedness.

Jokowinarno in (Haeril M. and Iradat, T. and Hendra, H., 2021) suggests six mitigation strategies, ranging from infrastructure protection to regulatory development and community economic sustainability. Bongi, Rogi, and Sela in (Purba, 2024) state that risk analysis and mapping are the basis for developing disaster management policies, especially in decision-making by local governments.

The conceptual framework in this study is structured based on a conceptual model that connects theory and research problems. According to Sugiyono (in Sugarino, 2021) , the conceptual framework shows the relationship between research variables. This study analyzes the implementation of disaster mitigation policies in Natuna Regency, focusing on forest and land fires in Cemaga Village, using indicators from Edward (Wati, 2022) , namely communication, resources, disposition, and bureaucratic structure. Issues highlighted include budget constraints, limited human resources, low public awareness, and suboptimal inter-agency coordination.

The final conceptual definition clarifies the use of terms in the research. Indicators of policy implementation include clear communication, adequate resources, supportive disposition of implementers, and a non-obstructive bureaucratic structure. Meanwhile, disaster mitigation, according to Home Affairs Ministerial Regulation No. 33 of 2006, includes the provision of information and maps, public education through outreach, mastery of rescue measures, and spatial planning to avoid disaster risks.

## METHOD STUDY

This research uses a qualitative approach, aiming to understand the meaning of individual or group experiences and perceptions regarding social issues. The analysis process is conducted inductively, moving from specifics to general understanding, with primary attention to the participants' perspectives. The researcher plays an active role in interpreting the data, hoping to unravel the complexities of the social situation being studied (Sugiyono, 2010) .

Data collection was conducted through three main methods: interviews, observation, and documentation. The data obtained were deemed valid and provided a picture of social processes in a local context. This approach enabled researchers to trace the chronology of events, understand cause and effect, and explore the meaning of the observed phenomena.

The object of this research is the conditions or entities that explain the disaster situation in Natuna Regency, specifically the case of forest and land fires in Cemaga Village. The focus is on mitigation efforts by the community, local government, and related institutions. This object refers to the definition according to (Supriati, 2012) as the main research variable, and Satibi (2011:74) as the mapping of the area and its characteristics (Sopaheluwakan, 2010) .

This research focuses on the implementation of disaster mitigation policies in Natuna. The aim is to assess the extent to which these policies are implemented in practice and their effectiveness in reducing disaster risk, taking into account the region's characteristics and geological aspects (Khodijah, 2024) . Implementation barriers and the influence of local conditions are also analyzed.

The research data comes from two sources:

- Primary Data: Data collected directly from sources through interviews with officials from the Regional Disaster Management Agency (BPBD), the fire department, and other relevant agencies. These interviews explored their policies

and strategies for dealing with the disaster in Natuna (Sugiyono, 2016).

- Secondary Data: Drawn from documents, official reports, archives, and relevant books and online media. This data provides additional context to strengthen the findings from primary sources.

Data collection methods consist of:

1. Interviews: Conducted with informants with relevant experience or knowledge, such as residents of Cemaga Village, BPBD officers, and other agencies. This technique provides a detailed understanding of mitigation policies and barriers to their implementation.
2. Documentation: Includes policy documents, evaluation reports, training materials, and archives from government agencies. The goal is to understand the policy historically and institutionally and to support the interview results.

The informants in the research consisted of four main parties:

Data analysis was conducted using a thematic analysis approach, identifying key themes from the data obtained, such as interview transcripts and documents. This process groups information into categories to understand the meaning that emerges.

The analysis model used refers to Miles and Huberman in (Sugiyono, 2016) which consists of three stages:

1. Data Reduction: Filtering and simplifying data from interviews, observations, and documentation to suit the research focus.
2. Data Presentation: Presenting data in the form of tables, graphs, or images to facilitate analysis and drawing conclusions.
3. Drawing Conclusions and Verification: Formulating conclusions based on the data presented and verifying their accuracy to ensure relevance to the research problem.

The research schedule was implemented over two months. The first month focused on developing objectives, research questions, and interview planning. The second month was devoted to initial data analysis and relevant document management. The research schedule outlined the stages from preparation to final testing, including seminars, revisions, and thesis defense.

## RESULTS AND DISCUSSION

This study examines the sustainable tourism management strategy of the Dendang Bertuah Village-Owned Enterprise ( BUMDes ) in Busung Village, Bintan Regency, Riau Islands Province. The main focus of this study is how BUMDes manages the Gurun Telaga Biru tourist area, formerly a former sand mining site, into a leading tourist attraction that contributes to Village Original Income ( PADes ), creates jobs, and maintains environmental sustainability and community participation.

The concept of a village as the smallest government entity given the authority to regulate and manage the interests of its community through Law Number 6 of 2014 has become the legal basis for the formation of BUMDes. As a business entity, BUMDes was formed to manage the village's economic potential so that it can develop and improve the welfare of the community, with the principles of professional, transparent, and sustainable management. The government provides support through regulations that encourage village economic independence, as reflected in Permendesa PDTT Number 4 of 2015 concerning the Establishment, Management, and Administration of BUMDes.

The Blue Lake Desert in Busung Village is the result of post-mining land transformation that has been developed into a tourist attraction. Sand mining, which once made Busung Village an economic center, left unproductive land. However, through village government initiatives and community participation, the area has been transformed into an attractive tourist destination, featuring a white sand desert combined with a natural blue lake. This unique geography makes the Blue Lake Desert attractive to both domestic and international tourists.

In its implementation, the Dendang Bertuah Village- Owned Enterprise (BUMDes) implements a strategy that relies on utilizing local potential, with the aim of creating new sources of income for the village and encouraging local community participation in economic activities, primarily through managing the tourism sector. The BUMDes chairman emphasized that the primary goal of managing tourist attractions is to increase village income and create jobs, along with awareness of preserving the area's natural environment. Although this objective has not yet been formalized in a standard strategic plan document, efforts have been made to consistently implement it through operational practices in the field.

The number of tourist visits has continued to increase since being managed by the Village-Owned Enterprise (BUMDes). Management data shows significant increases in both foreign and domestic tourist visits, particularly during national holidays. For example, during the 2024 Eid al-Fitr holiday, the number of tourists increased to over 9,000 over 10 days, with 3,000 of them being international. On normal days, the number of foreign tourists ranges from 10 to 20 per day. This data demonstrates the strong appeal of this tourist area.

Owned Enterprise (BUMDes) commenced its management activities with initial capital sourced from the Village Budget (APBDes) of Rp50,000,000 in 2021, then increased by Rp100,000,000 in 2023. Although there has been no capital participation from the community, a scheme to involve community investment in tourism development has been designed as part of a long-term strategy. BUMDes has the vision of "Building the Village Together" and is committed to carrying out business management in a participatory and responsible manner, based on the principles of empowerment and sustainability.

BUMDes strategy in managing the Blue Lake Desert can be analyzed through five elements of public strategy according to Geoff Mulgan (2009) defines purpose, context, direction, action, and learning. These five elements serve as tools for evaluating and measuring the effectiveness of BUMDes ' management strategies. In terms of objectives, BUMDes' orientation is not only economic, but also social and environmental, which are integrated into the triple bottom line. bottom line : profit, people, planet.

However, the lack of measurable success indicators and the absence of an evaluation system make it difficult to objectively assess the achievement of these goals. The strategies implemented remain normative, based more on field experience and intuition than on written strategic documents like business plans or medium-term work plans. Development goals such as improving service quality, diversifying tourist attractions, and involving MSMEs are not yet supported by clear indicators for their achievement.

In context, the Blue Lake Desert is an area with significant geographical potential, but faces legal challenges. Land tenure remains a major obstacle to more permanent development. This tourist area sits on land owned by a third party, and to date, there has

been no land conversion scheme or purchase by the village. This hampers efforts to develop permanent facilities and creates uncertainty regarding long-term management ( Zurianto, interview, July 10, 2024). On the other hand, local residents' enthusiasm for sustainable tourism is quite high, as evidenced by their participation in area cleanup activities and involvement in the management of parking, food stalls, and photography services.

The strategic direction or guidance implemented by BUMDes originates from the village head as policy director, with BUMDes as technical implementers. However, there is no strong synergy in the form of planning documents such as the RPJMDes, which integrates tourism development as a priority village program. Directions are verbal and responsive to field dynamics. Coordination between BUMDes and Pokdarwis has not been fully effective due to a lack of clarity in work structures and role divisions. Relations with local businesses are sometimes disrupted by changing policies without adequate socialization, such as those regarding opening hours, parking management, or tariff adjustments.

Concrete actions taken by the Village-Owned Enterprise (BUMDes) in managing the area include parking arrangements, providing photo spots, managing cleanliness, and providing English language training for local youth. While these actions reflect a commitment to improving service quality, limited resources and legal uncertainty over land rights limit further development. Tourism marketing is conducted independently through social media by the management, but is not yet supported by a professional promotional strategy based on tourist data or collaboration with travel agencies. Financial management is carried out manually, although simple digital record-keeping has begun to be adopted.

Organizational learning within the Village-Owned Enterprise (BUMDes) occurs informally, including through daily operational experiences, tourist input, and observations of tourism management practices elsewhere. Program evaluation is not conducted through formal systems, but through internal discussions and the development of situational solutions. For example, after receiving complaints about cleanliness, management increased the number of trash bins and established a regular community service schedule ( Pokdarwis member, interview). Furthermore, management has begun to recognize the importance of training and capacity building for managers and village youth, by organizing foreign language training and basic tourism services.

Village heads play a significant role in driving the learning process, both through facilitating training activities and supporting village-owned enterprises (BUMDes) in establishing partnerships with external parties. Evaluations from the Village Consultative Body (BPD) are also part of the collective learning process. However, the documentation and reporting system for activities remains suboptimal, resulting in knowledge often remaining undocumented and unable to be used as a basis for policy improvement.

From the overall process, it can be concluded that the management of the Blue Lake Desert tourism area by the Dendang Bertuah Village- Owned Enterprise (BUMDes) demonstrates strong local initiative, with a participatory and adaptive approach to field conditions. While not entirely ideal in terms of strategic planning, legality, and institutional structure, the implemented strategy reflects the spirit of sustainable development that favors the local community. Its success in attracting tourists and stimulating the village economy demonstrates significant potential for further development.

Key recommendations for strengthening the strategy include the need for land legality for more independent and sustainable management, the development of integrated strategic planning documents between villages and village-owned enterprises (BUMDes ), and capacity building for BUMDes administrators and local tourism stakeholders. Partnerships with local governments, the private sector, and educational institutions also need to be strengthened to enhance the competitiveness of tourism areas. Finally, it is crucial to establish a data-driven monitoring and evaluation system so that strategic decisions are not based solely on intuition but on objective evidence and analysis.

## CONCLUSION

Based on research on the implementation of disaster mitigation policies in Natuna Regency, particularly the case of forest and land fires in Cemaga Village, it was concluded that policy implementation has reflected active efforts from the government and related institutions, although it still faces a number of significant obstacles. Referring to George C. Edward III's theory of policy implementation, which includes communication, resources, disposition, and bureaucratic structure, the study shows that communication has been carried out through social media, direct outreach, and inter-agency coordination. However, limited digital infrastructure and a lack of experts have prevented information from being effectively conveyed to remote areas, such as South Bunguran, including Cemaga. On the resource side, obstacles such as a lack of budget, lack of technical training, limited firefighting fleets, and weak monitoring technology remain major obstacles to equitable and comprehensive mitigation efforts in vulnerable areas.

Meanwhile, the disposition of policy implementers such as the Regional Disaster Management Agency (BPBD) and the Fire and Rescue Department (DAMKAR) was assessed positively, demonstrating high work ethic and loyalty. However, community participation remains low. In Cemaga Village, residents tend to be passive in their approach to training and simulations, resulting in suboptimal involvement in supporting mitigation policies. Bureaucratic structures at the government agency level have been established, but this has not been matched by community-level preparedness. The absence of a standby post or permanent volunteer team in Cemaga is evidence of the local fire preparedness gap.

In general, disaster mitigation policies in Natuna have been implemented, but they have not been running optimally. The main obstacles stem from limited resources, weak inter-agency coordination, and low public awareness and involvement. Therefore, strategic steps are needed to strengthen human resource capacity through regular technical training and the addition of disaster management infrastructure, particularly in vulnerable areas like Cemaga. Furthermore, disaster mitigation communication must be optimized by providing emergency information networks and developing educational content that is easily accessible to rural communities.

The government also needs to increase community participation through scheduled simulation and education programs, as well as establishing standby village volunteers. Strengthening inter-agency coordination is crucial, including developing joint standard operating procedures (SOPs) and holding regular forums to ensure a more rapid and structured disaster response. Regular policy evaluation and monitoring are also essential to adapt strategies to the dynamics of disaster risk. This is crucial for creating

an adaptive, responsive, and community-based mitigation system, particularly in addressing the threat of forest and land fires in areas like Cemaga Village.

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