COMMUNITY PARTICIPATION IN FLOOD DISASTER MITIGATION IN THE CAPITAL OF NORTH ACEH DISTRICT

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ABSTRACT

Floods are one of the most frequent disasters that hit Indonesia, especially North Aceh District. Flood is a disaster that causes a lot of loss in the form of property and lives, disrupting the activities of the population. Therefore, flood disaster mitigation is important to be carried out by the government by involving the community to reduce the impact of flood disasters that occur so that this can reduce the number of flood risks. One of the efforts made by the government is a cooperative relationship between the government and the community to obtain optimal results. In reviewing flood mitigation efforts, a qualitative approach was carried out with research procedures that produced descriptive data. This descriptive data can be sourced from the local community and observable community behavior. Data collection was carried out by means of in-depth interviews. The results of the analysis show that there has been a flood mitigation effort from the government in the Krueng Keureuto area in the form of the current dam construction and cooperation with the community which is called community participation. This is done by inviting the community to be able to carry out flood disaster mitigation plans. Mitigation planning activities involving the community are carried out by studying and discussing things that might happen before the flood occurs, emergency response during the flood and post-flood recovery. Therefore, disaster mitigation is needed both structurally and non-structurally.
Keyword: *Community Participation, Disaster, Floods, Mitigation.*

INTRODUCTION

Indonesia is a country that is highly susceptible to natural disasters. Based on statistics from the 2008 World Risk Report, Indonesia is ranked 36th out of the 172 nations with the highest risk of disaster, with a risk index of 10.36. This state is produced by the fact that Indonesia is geologically positioned between three of the world's largest tectonic plates, which move convergently, and volcanically located in the path of an active volcano known as the Ring of Fire (Dubov, 2021). In addition, hydroclimatologically, Indonesia is affected by el-nino and la nina phenomena, which has an impact on the occurrence of floods, landslides, droughts, and tornadoes (Mursidi & Sari, 2017).

A flood is a significant overflow of river water caused by excessive precipitation. Floods are common in Indonesia during the rainy season. Floods can occur as a consequence of upstream deforestation, heavy rainfall, waste disposal in rivers, a lack of water drainage, and changes in land use. High rainfall intensity is one of the primary causes of flooding in North Aceh District, particularly in Lhoksukon, the district's capital. Floods brought on by heavy rainfall and steep slopes have an impact on the surrounding area which happens to be in a relatively lower position. Floods are exacerbated further by river pollution which is typically caused by people throwing waste on the river's banks (Benani & Sudarti, 2022). Garbage disposal on riverbanks degrades river water quality and disrupts river flow, resulting in catastrophic flooding (Suherdiyanto & Prihadi, 2021). As in the case

of natural disasters that occur almost every year in the North Aceh region.

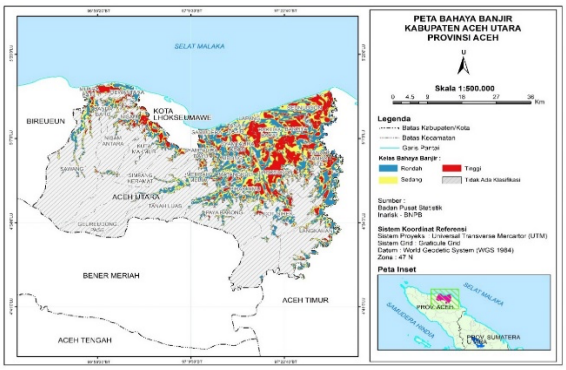
Lhoksukon is a region that has seen rapid changes in land usage. This is due to the fact that Lhoksukon has been designated as the Capital of North Aceh District since 2001 in accordance with Law No.2 of 2001, and its implementation has been carried out efficiently in accordance with PP No.60 of 2002. The separation of North Aceh District and Lhokseumawe City has had a substantial impact on the changes of land usage in areas with high residential land expansion. Changes in land use from water absorption regions to residential areas are linked to the annual flood disaster in North Aceh District. The disaster history in North Aceh District is shown in the table below.

Table 1. Disaster History in North Aceh District

Kind of Disaster	Occurance	Evacuee	Lightly Damaged House
Flood	27	3,030	724
Extreme Waves and Abrasion	1	-	-
Earthquake	1	8268	-
Forest and Land Fire	1	-	-
Drought	6	-	-
Extreme Weather	6	100	379

Source: (BNPB, 2022)

North Aceh District has quite a complicated history of disasters. Floods are the most common type of disaster with high statistical probability. The following is a flood hazard map for North Aceh District.



Source: Analysis Results, 2023

Figure 1. Flood Hazard Map of North Aceh District

Several efforts to deal with this flood have been carried out by the Government, such as what is currently underway, the construction of the Keureuto dam, which is a dam that accommodates the quantity of water from Krueng Keureuto, the preparation of a river water level monitoring system, and preparations by the Regional Disaster Management Agency or Badan Penanggulangan Bencana Daerah (BPBD) in preparing disaster management assistance for communities in flood-prone villages to minimize the impacts. However, the government's efforts alone will not suffice to tackle the flood problem; coordinated and collaborative action between the government and the community in the flood disaster area is required.

Actions to mitigate or minimize the impact of flood disasters through a non-structural bottom up system approach by mobilizing community participation can be carried out as part of an effort to assist government and community efforts in preparing themselves for future flood disasters.

LITERATURE REVIEW

Community Participation

Participation as a concept in community development is implemented generally and broadly. “Participation is a central concept and basic principle of community development because, among many things, it is closely related to mitigation efforts. Community engagement in development implies that the community is not only accountable for development but also for

receiving and utilizing the outcomes of development (Darmansyah et al., 1986). Community participation in development program implementation can be both physical and non-physical (Darmansyah et al., 1986). Many experts define participation as an attempt to participate in a development-related activity. Other frequently used words for participation are engagement, involvement, and taking part, which is shown in Indonesia's mentality of gotong royong (mutual cooperation or collaboration). According to Budiono (1999), participation or gotong royong is an effort undertaken collectively regardless of compensation with the goal at advancing the greater good. In the same way, Widiayanti and Sunindha (1989) define it as a collaborative effort that can be realized through participation. Achmadi (1978) added that community participation in the form of mutual cooperation is the main capital. While autonomy is described as the ability of a group of individuals to meet their own needs through their own awareness and initiative. Participation can be an outcome and an entry point for development. In this context, the community's participation in the program can take the shape of flood catastrophe mitigation. According to Suratmo (1995), the primary goals of participation in the community are as follows:

a) involving the community in environmental management.
b) Involving the community in the development of the country.
c) Assisting the government with establishing better and more precise policies and decisions.

Disaster Mitigation

Disaster mitigation is defined in Law No. 4 of 2008 as a range of measures aimed at reducing the risk of disasters, including both structural and non-structural development, as well as raising citizens' awareness and ability to respond to disasters. Disaster mitigation should be prepared as a baseline for disaster management preparation. The goal of disaster mitigation is to reduce the impacts that could have occurred as results of a disaster by focusing on the disaster stage. There are two types of disaster mitigation efforts: structural mitigation and non-structural mitigation (Wahyuningtyas, Tanjung, Idris, & Dewi, 2019):

1) Structural mitigation is the establishment of disaster-resistant building through technical engineering, as well as water-resistant building infrastructure, in order to reduce disasters, such as by creating a unique flood prevention lake. As a result, it is projected that if a calamity occurs, the waterproof building architecture will receive minimal impact. The following are some examples of structural mitigation:
   a) Building defensive walls and embankments. Defense walls are strongly advised to be constructed around rivers that are prone to flooding, such as in areas surrounding settlements. This is highly beneficial in minimizing the risk of flood disasters, which frequently occur due to unpredicted water volume.
   b) Controlling the flow rate and volume of water. To prevent flooding, reservoirs/dams are recommended to be built upstream of the river. The flow rate and volume of water in the upstream area of the river need to be closely monitored.
   c) Sterilizing rivers and create waterway diversion. It is critical to clean up the river since this will help reduce the sedimentation that has accumulated in the river. This method can be employed in rivers with closed or open channels, as well as tunnels.
2) Non-structural mitigation techniques are efforts involving area planning and insurance. With this increasingly advanced technology, non-structural mitigation emphasizes heavily on technological advancements, with the goal that technology can project, anticipate, and minimize the risk of a disaster occurring. Examples of non-structural mitigation strategies include:
   a) Establishing Non-Governmental Organizations (NGOs)
   b) Providing outreach and training
   c) Forming a working group
   d) Evaluating flood-prone areas

e) Renovating infrastructure and facilities
f) Analyzing flood-related data
g) Mapping
h) Instrument testing
i) Providing supplies of primary needs
j) Establishing a Flood Disaster Standard Operating Procedure (SOP)
k) Creating an evacuation simulation
l) Organizing meetings

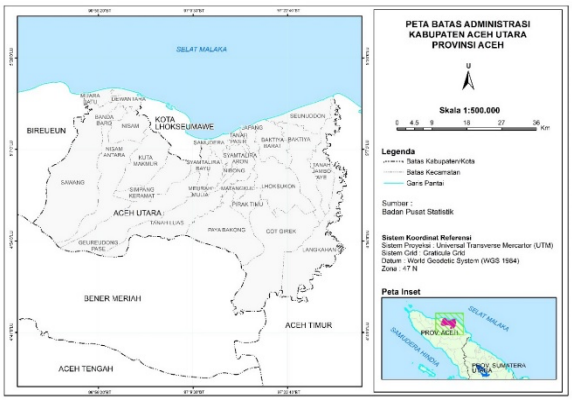
RESEARCH METHODS

This study was carried out in North Aceh District, Aceh Province. This study's subjects were drawn from the residents of North Aceh District. In-depth interviews were used to acquire data. In-depth interview is a type of data collecting technique that is used to get information orally through debriefing with a number of informants who can provide information about issues being researched. This strategy seeks to collect direct information from informants by offering certain main ideas or frameworks and outlines of the same questions in the interview process to multiple informants. The researchers performed in-depth direct interviews with chosen informants to collect authentic and reliable data and information to obtain primary data. During the interview process, the writer recorded the information provided by the informants, which was subsequently used as material to compose a research report. The researchers used a tape recorder to capture interviews. This recording device was used as a cross-check material if, during the analysis, there is data, information, or details that was not captured by the researcher. Several members of the community in the area, as well as some village officials known locally as keuchik, were invited as data sources or informants in this study. In order to attain this goal, secondary data collection is done in addition to primary data collection.

RESULTS AND DISCUSSION

Identification of Flood Disasters

North Aceh is a district in the Aceh province. Administratively, North Aceh District has the following territorial boundaries: by the Malacca Strait to the north, East Aceh District to the east, Central Aceh District and Bener Meriah District to the south, and Bireuen District to the west. North Aceh Regency, whose capital is Lhoksukon, covers an area of 3,296.86 km2 and is divided into 852 villages or gampongs and 27 sub-districts, namely Sawang District, Nisam District, Kuta Makmur District, Syamtalira Bayu District, Meurah Mulia, Matang Kuli District, Tanah Wide District. , Samudera District, Syamtalira Aron District, Tanah Pasir District, Lhoksukon District, Baktiya District, Tanah Jambo Aye District, Seuneudong District, Cot Girek District, Muara Batu District, Dewantara District, Stepan District, Evidenceya Barat District, Paya Bakong District, Nibong District, Simpang Keramat District, Lapang District, Pirak Timu District, Geureudong Pase District, Banda Baro District and Nisam Antara District (BNPB, 2022).



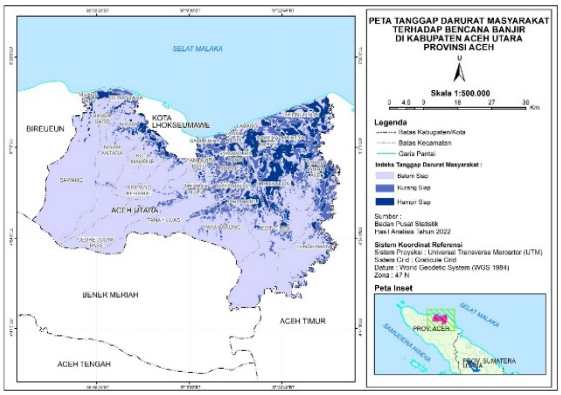
Source: Analysis Result, 2023

Figure 2. North Aceh District Administrative Boundary Map

Identification of the flood disaster in North Aceh District is carried out as an area with a relatively high level of disaster susceptibility. The prolonged rainy season and high rainfall are the causes of flooding in North Aceh District. Each year, the impacts include environmental damage, infrastructure and public facilities damage, property loss, and casualties.

Disaster mitigation, both structural and non-structural, goes hand-in-hand with the disaster management cycle, starting with mitigation planning, emergency response, recovery, and establishing a mitigation plan involving the community. The form of flood disaster mitigation preparedness carried out by

the people of North Aceh Regency is in the form of a community emergency response plan in the North Aceh Regency region, as shown on the map below.



Source: Analysis Result, 2023

Figure 3. Map of Community Emergency Response to Floods

According to the map above, the residents of North Regency are not yet in the category of sufficiently prepared for the flood emergency response mitigation plan. Consequently, non-structural flood control initiatives must be undertaken using a bottom-up system approach that involves community participation in minimizing the impact of flood hazards.

Flood disaster mitigation initiatives in North Aceh District must carry out flood disaster mitigation operations in order to reduce the risk of flood calamities. Physical (structural) mitigation and non-physical (non-structural) mitigation are mitigation approaches used, particularly in flood hazard areas with the highest level of flood hazard risk.

Structural Mitigation

At the preventative stage, the government undertook flood control infrastructure projects and established settlement arrangements in river border areas. The availability of the structural mitigation development program in North Aceh District comprises the development of:

a. Residential layout planning, including the designation of building types and riverbanks in flood-prone locations. Particularly in sloping and densely populated areas where flood inundation is projected. A river border arrangement has been implemented in a flood-prone area in North Aceh District.
b. Construction of flood control structures. A flood control structure is a type of construction that is meant to withstand or sustain minimum damage in the case of a disaster. The flood control infrastructures available in North Aceh District include river embankments, sufficient drainage systems, and dams.

Figure 4. Krueng Keureuto Dam

Non-Structural Mitigation

At the preventative stage, the government has attempted non-structural mitigation efforts, implementing multiple projects in affected areas in each sub-district. Several types of non-structural mitigation have been implemented, including:

a) Flood disaster education and simulation training program.

Given the limitations the government faces when it comes to disaster management, an alternate solution is to educate the general public, particularly school communities, as a preventative strategy for dealing with natural disasters. Schools and other educational institutions play an important part in the national disaster prevention program. Schools are seen as effective institutions for influencing people's perspectives and behaviors through disaster mitigation education (Astuti & Sudaryono, 2010). Consequently, the community and school members in North Aceh District must have the attitudes, knowledge, and skills to deal with natural disasters, so that the community's tangible and non-tangible damages are minimized. Attitude, knowledge, and skill development, one of

which is carried out through disaster mitigation education through community participation.

The flood disaster education and simulation training program implemented in schools includes an explanation of natural flood disasters, including factors resulting in floods, the impact of floods, how to save oneself from floods, and how to deal with floos. This training employs a simulation strategy in conjunction with disaster-related games and other medias. The teacher and students watched a video, and at the end of the session, they practiced safeguarding themselves from a flood disaster. Playing disaster-related games can help people understand and prepare for natural disasters (Syuaib, 2014). This activity is carried out by actively optimizing the role of teacher, with the intention that it may be carried out in a sustainable manner to nurture students who are prepared for future natural disasters (Rahma, 2018).

b) Establishing Non-Governmental Organization (NGO)

Noolen Heyzer identified three types of roles played by NGOs in disaster management in Affan Gaffar (2001), namely: (1) supporting and empowering communities at the grassroots level, which is essential for creating sustainable development; (2) increasing political influence broadly through a network of cooperation both within a country and with other international institutions; and (3) participating in determining the direction and agenda of development.

In essence, community participation can be seen in NGO initiatives that pursue a bottom-up approach by seeing humans as subjects of development. Eliot (1987: 57) states that there are three strategic approaches that NGOs must implement. The first is the welfare approach, an approach to provide assistance to specific communities afflicted by disasters such as floods, famine, natural disasters, wars, and other calamities. This method seeks to empower people in dealing with the process of impoverishment, rather than providing strength or the ability to collect aid funds. Second, the developmental approach, which focuses program efforts on the development of development projects aimed at strengthening community capacity and autonomy. Third, the empowerment method, which sees poverty as a result of political processes and attempts to empower or train individuals to overcome their powerlessness.

In order to support the government's and the community's preparations for future flood disasters, non-structural efforts to control or lessen the effects of floods can be carried out through a bottom-up system approach by involving community participation. By empowering the community, it is feasible to minimize the suffering brought on by the threat of floods through collaborative attempts that lessen the risk of flood fatalities and increase the community's capability to respond to flood hazards independently.

This effort is a form of community concern to alleviate the suffering of flood-affected people. This type of activity is a manifestation of community concern to alleviate the suffering of flood-affected people. This community capacity-based mitigation movement is intended to strengthen the capacity of people living in flood-prone areas to deal with flood disaster risks, and it is expected to reduce future disaster risks, foster initiatives in determining priority actions, and seek solutions to increase community participation and initiative in flood-prone areas. The following activities can be used to establish mitigation institutions and plan for implementation:

1) Preparation for the establishment of a steering committee comprised of government agencies, donors, and community groups from the activity site.
2) Preliminary study and survey.
3) Development of community profiles based on an awareness of their susceptibility and strength/ability to mitigate the threats of flood disasters, as well as their socioeconomic conditions. This includes participatory training and

activities for the community in (a) understanding flood hazards; (b) developing flood mitigation activities formulation; and (c) identifying alternative activities that can be implemented.

4) Assistance in the formulation of mitigation activity plans.
5) Assistance for the community in procuring resources.
6) Activity implementation and monitoring.
7) Evaluation of activity outcomes and recommendations for the future.
8) Preparation of activity reports.

c) Establishment of disaster resilient villages.

A disaster-resilient village is a village or sub-district that has received training from the Regional Disaster Management Agency with a goal to recognize threats in their area and organize community resources to reduce susceptibility while improving their ability to minimize risk from disasters. The dissemination of the program for forming a disaster-resilient village was distributed to the community and community leaders in North Aceh District to provide an overview of the disaster-resilient village program's implementation and to obtain input and suggestions for developing a strategy for implementing the disaster-resilient village program in North Aceh District. Basic training on the establishment and development of disaster-resilient villages was also provided to the North Aceh District community and village apparatus to provide understanding about the development of disaster-resilient village programs and the methods being implemented.

d) Using a Participatory Approach to Flood-Prone Areas Condition or Pendekatan Partisipatif Kondisi Daerah Rawan Banjir (PPKDRB)

The Participatory Approach to Flood-Prone Area Conditions (PPKDRB) refers to the process of learning and working together through a series of planned techniques that can encourage the community to actively participate in increasing their knowledge and analytical skills about their own living conditions, allowing residents to make appropriate action plans and develop a survival strategy. Outsiders such as researchers, benefactors, and officers assist the PPKDRB community in analyzing their living conditions, which include any potential or problems that present in their area. The community is then assisted in developing programs based on the potential that exists in their region as well as the potential that exists beyond their area that may be utilized by the community to tackle the problems faced by the community.

CONCLUSION

Non-structural actions involving the mobilization of community participation to control or mitigate the impact of flood disasters can be carried out as part of an effort to support government and community initiatives in preparing for future flood disasters. By empowering the community, the suffering of the community due to the danger of floods can be avoided to the greatest extent feasible through community activities that lower the possibility of flood disasters and strengthen the ability to cope with flood hazards autonomously. This type of initiative is a manifestation of community concern to alleviate the suffering of flood-affected people. This community capacity-based mitigation activity is expected to reduce future disaster risks, foster initiatives in determining priority actions, and find solutions to increase community participation and autonomy in flood-prone areas.

Community participation is defined as a collective attempt by community members and the government to reduce losses and suffering caused by flooding in North Aceh District. The following are some examples of activities that can be carried out:

1. Promoting public awareness of flood risk in flood-prone areas through public outreach and other means.
2. Provide an overview and information on the various kinds of flood disaster mitigation measures that the community can undertake.

3. Establish initiatives in the community to reduce the danger of flood disasters by improving the quality of life and the environment.
4. Encouraging the community to take flood mitigation measures by going through a process of identifying and prioritizing actions, as well as their implementation in the community.

DAFTAR PUSTAKA

Astuti, S. I., & Sudaryono. (2010). Peran Sekolah dalam Pembelajaran Mitigasi Bencana. *Jurnal Dialog Penanggulangan Bencana*, *1*(1), 30–42.

Benani, N. B. A., & Sudarti, S. (2022). Analisis Perilaku Masyarakat dalam Membuang Sampah di Bantaran Sungai Setail. *Jurnal PIPSI (Jurnal Pendidikan IPS Indonesia)*, *7*(3), 255–264. https://doi.org/10.26737/jpipsi.v7i3.2833

BNPB. (2022). *Indeks Rawan Bencana Indonesia Tahun 2022*. Jakarta.

Darmansyah, M., Fathurahman, L. A., Sustiwi, F., Fadjri, M., Yasin, S., Suryansyah, S., & Zain, M. T. (1986). *Ilmu Sosial Dasar*. Surabaya: Usaha Nasional.

Dubov, K. (2021). *Journey to the Republic of Indonesia: Review & Analysis*.

Mursidi, A., & Sari, A. D. P. (2017). Management of drought disaster in Indonesia. *Jurnal Terapan Manajemen Dan Bisnis*, *3*(2), 165–171.

Rahma, A. (2018). Implementasi Program Pengurangan Resiko Bencana (PRB) Melalui Pendidikan Formal. *Varia Pendidikan*, 1–4.

Suherdiyanto, S., & Prihadi, A. (2021). Analisis Pembuangan Sampah Rumah Tangga di Bantaran Sungai. *Jurnal PIPSI (Jurnal Pendidikan IPS Indonesia)*, *6*(2), 54–62. https://doi.org/10.26737/jpipsi.v6i2.2543

Syuaib, M. Z. (2014). Pengaruh Strategi pembelajaran simulasi vs bermain peran dan sikap siswa terhadap pengetahuan dan kesiapsiagaan tentang bencana alam. *Jurnal Pendidikan Humaniora*, 177–189.

Wahyuningtyas, N., Tanjung, A., Idris, I., & Dewi, K. (2019). Disaster mitigation on cultural tourism in lombok, Indonesia. *Geo Journal of Tourism and Geosites*, *27*(4), 1227–1235.