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Strategy to Increase Public Awareness in Flood-Prone Areas

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ABSTRAK

Banjir merupakan salah satu bencana alam yang paling sering terjadi di Indonesia dan berdampak luas terhadap kehidupan sosial, ekonomi, dan lingkungan. Di Kota Manado, sampai dengan tahun 2024, terdapat 10 kecamatan dan 48 kelurahan yang dikategorikan sebagai daerah rawan bencana banjir. Penelitian ini bertujuan untuk menganalisis strategi peningkatan kesadaran masyarakat di wilayah rawan bencana banjir di Kota Manado, Provinsi Sulawesi Utara. Penelitian ini menggunakan metode kualitatif dengan pendekatan studi kasus. Teknik pengumpulan data dilakukan melalui wawancara mendalam dengan pihak Badan Penanggulangan Bencana Daerah Provinsi Sulawesi Utara dan Kota Manado serta masyarakat di lokasi rawan banjir, observasi langsung, serta pengumpulan data sekunder. Analisis data dilakukan secara induktif dengan tahapan reduksi, penyajian data, interpretasi, dan penarikan kesimpulan. Hasil penelitian menunjukkan bahwa strategi sosialisasi dan pelatihan melalui media cetak dan elektronik belum efektif. Strategi yang lebih relevan dan tepat sasaran meliputi pembentukan dan pelatihan komunitas sadar bencana di tingkat kelurahan, sosialisasi langsung secara tatap muka, serta penindakan terhadap aktivitas masyarakat yang dapat memicu banjir. Strategi-strategi tersebut dinilai mampu meningkatkan kesadaran dan kesiapsiagaan masyarakat dalam menghadapi bencana banjir.

ABSTRACT

Floods are one of the most frequent natural disasters in Indonesia and have a wide impact on social, economic, and environmental life. In Manado, continuously from 2024, there are 10 sub-districts and 48 villages that are categorized as flood-prone areas. This study purposed to analyze strategies for increasing public awareness in flood-prone areas in Manado City, North Sulawesi Province. This study applied a qualitative method with a case study approach. Data collection techniques were conducted through in-depth interviews with the Regional Disaster Management Agency of North Sulawesi Province and Manado, and communities in flood-prone locations, direct observation, and secondary data collection. Data analysis was conducted inductively with the stages of reduction, data presentation, interpretation, and conclusion. The results of the study showed that the strategy of socialization and training through print and electronic media was not yet effective. More relevant and targeted strategies include the formation and training of disaster-aware communities at the village level, direct face-to-face socialization, and taking action against community activities that can trigger flooding. These strategies are considered capable of increasing public awareness and preparedness in dealing with disasters, particularly floods.

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INTRODUCTION

Every human being desires to have a safe and peaceful life. However, each person is also dealt with various threats. One of the threats faced by humans is disaster. It can occur due to natural factors, natural factors, or natural social disasters. Natural disasters that emerge in the world including Indonesia are mostly related to the weather. As a result of the weather, floods and landslides are the top disasters in the world (Prihatin, 2018). Floods are the most frequent disasters that have a very broad impact on humans in social, economic (Astuti, 2013) aspects, lives, infrastructure, and health (Rachmawati, et al., 2018). Disasters are one of the major

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challenges faced by humanity, and almost everyone wants a life free from threats, especially those that can damage the safety and stability of life. The desire to live in safe and peaceful conditions is a universal goal, but the reality shows that the threat of various disasters is always there, whether caused by natural factors, non-natural factors, or social disasters.

Natural disasters are one type of threat that cannot be completely avoided. This occurs as a result of extreme natural conditions or ecological imbalances. Many natural disasters occur in this world, and Indonesia, as a country located in the Pacific Ring of Fire, is one of the countries that are very vulnerable to natural disasters, especially those related to weather. Unpredictable extreme weather can lead to various types of natural disasters, with floods and landslides being the two most common in many places, including Indonesia.

Floods, for example, are disasters that often occur due to very high rainfall in a short period or due to rising water levels in rivers and lakes. Floods can have a major impact on human life, both in terms of social, economic, health, and infrastructure. In terms of social aspects, floods can cause loss of housing, destroy life resources, and worsen the psychological condition of affected residents. Meanwhile, in terms of the economy, floods can cause major losses due to the destruction of agriculture, loss of income, and disruption of economic activities in the affected areas. Floods can also threaten human life, especially if they involve fatalities due to strong currents or being buried by material carried by the flood. In addition, floods can also damage infrastructure such as roads, bridges, and other important buildings, which will require large costs for repair and reconstruction. No less important, floods can also cause the spread of diseases, such as diarrhea, malaria, or dengue fever, which often appear after the disaster. The already burdened health system must handle an even greater increase in the number of patients due to poor sanitation conditions and the spread of disease. Overall, flooding is a disaster that has a very wide impact, both in terms of physical damage and in terms of long-term consequences for human life. Therefore, the government and society need to have an effective mitigation strategy, to reduce the impact of this disaster and increase preparedness for the possibility of other natural disasters.

To address disaster issues in Indonesia, the government has established a technical institution guided by regulation Number 24 of 2007, which regulates disaster management. In disaster mitigation and management efforts, the National Disaster Management Agency (BNPB) plays an important role, by providing coordination and support to related institutions at the central and regional levels. This policy provides a strong legal basis for the implementation of disaster management, to reduce the risk and impact of disasters and accelerate recovery after a disaster occurs. BNPB's duties, in addition, also include formulating policies, providing education to the community, and providing logistical assistance and resources in disaster management. At the regional level, especially in Manado City, the city government has also followed up on this national policy by issuing Manado Mayor Regulation Number 64 of 2016. This regulation is a reference for implementing a disaster management system that is more organized, systematic, and based on community needs. This regulation regulates various aspects, from prevention, and mitigation, to post-disaster recovery. One of the main implementations of this policy is increasing the capacity of human resources at the regional level, through disaster training and simulations for the community and government officials. In addition, the Manado City government also developed a disaster early warning system, mapped disaster-prone areas, and strengthened coordination between related agencies to ensure preparedness and rapid response when a disaster occurs.

This policy is expected to create a more resilient environment against disasters, as well as increase public awareness of the importance of mitigation and preparation before a disaster

occurs. Disaster management programs that have been implemented in Manado City also show the commitment of the local government to strengthening community resilience in facing the threat of disasters, to minimize material and non-material losses when a disaster occurs. The Regional Disaster Management Agency has taken various steps related to flood management. The work plan and budget followed by the allocation of human resources, financial resources, and suggestions have been well organized at the Manado City Regional Disaster Management Agency. Likewise, by carrying out collaborative work with related agencies and also followed by supervision. However, even though there is light rain, many sub-districts in Manado City experience flooding. This happens not only because of the high rainfall and the many river basins but also has a lot to do with the poor behavior of the Community in maintaining and preserving nature. Construction of houses that are not by the rules in the river basin area, the occurrence of swallowing of rivers and drainage due to garbage, and the lack of community preparedness in anticipating flood disasters. In this situation, 10 sub-districts with 48 urban villages are areas prone to flooding.

Table 1.
Annual Flood Trends and Their Impacts in Manado City (2015–2025): A Historical and Spatial Analysis

Year	Number of Flood Events	Main Affected Locations	Highest Rainfall (mm/day)	Main Impact	Additional Details
2015	3	Tikala, Paal Dua, Tuminting	±180 mm	Dozens of houses were damaged, road access was disrupted	Moderate to high rain intensity
2016	4	Wenang, Singkil, Sario	±200 mm	Inundation in the city center, evacuation of residents	Poor drainage, occurs 2 times in 1 month
2017	2	Tikala, Malalayang	±150 mm	Minor damage, schools closed	Short rainy season
2018	5	Tikala, Tuminting, Mapanget	±210 mm	Hundreds of houses submerged, 1 fatality	Flood of shipments from upstream areas
2019	3	Paal Dua, Tikala	±170 mm	Main road access cut off, landslides	A combination of rain and garbage accumulation
2020	4	Wenang, Ternate Tanjung	±190 mm	Public facilities are damaged	COVID-19 pandemic slows response
2021	5	Tikala, Paal Dua, Singkil	±200 mm	Thousands of lives affected, emergency relocation	Longer rainy season
2022	3	Tuminting, Sario	±160 mm	Damage to houses, inundation at school	Decrease in river capacity
2023	6	Tikala, Paal Dua, Wenang, Tuminting	±230 mm	Thousands of houses submerged, 3 fatalities	Biggest flood after 2014

Year	Number of Flood Events	Main Affected Locations	Highest Rainfall (mm/day)	Main Impact	Additional Details
2024	4	Sario, Singkil, Malalayang	±170 mm	Significant economic losses	Local extreme rains
2025*	2 (until May)	Tikala, Tuminting	±160 mm	Fast-receding puddles, embankment system tested	Not yet the peak of the rainy season

Source: Researcher's Analysis, 2025

*Note: 2025 data is provisional and may change according to weather developments until the end of the year.

Efforts to resolve the problem can be made by approaching prevention. Prevention can be started with the existence of a community that is aware of the dangers of flood disasters. Forming a community that is aware of flood planning is not easy. However, it requires the correct strategy. Because the community has different educational backgrounds, knowledge, and experiences as well as diverse needs and desires. The realization of a disaster-aware community can be achieved through disaster-aware families, especially in vulnerable areas, forming a disaster-aware community in addition to training to carry out disaster mitigation. However, it is necessary to examine the methods or strategies to achieve the target, namely the formation of a flood-aware community in Manado City. A community that is aware of disasters is a community that has the knowledge and understanding to obey all regulations related to disaster mitigation and maintaining the sustainability of nature and also knows, understands, and realizes that the earth is a disaster-prone area. A community that has an active role is willing to collaborate with the government to prevent and overcome disasters.

Disaster management that has occurred in Indonesia until now has been faced with obstacles caused by regulations related to the authority of the central and regional governments, the role of the National Disaster Management Agency, and the accountability of emergency funds. So it is difficult to achieve the level of effectiveness in disaster management in Indonesia (Ayuni & Arsil, 2021). Likewise, coordination between institutions is one of the causes of the difficulty in increasing the effectiveness of disaster management (Jibiki, et al., 2020; Akhya. et.al, 2023). To resolve this, collaborative governance is required in disaster management that emphasizes coordination between government and non-government institutions in emergency mitigation, as well as a community-based recovery approach after a disaster (Khafian, 2023). The intended community-based recovery approach is related to the participation or involvement of local communities. This is in line with Shaw's findings (2012) that community-based strategies are important in increasing local awareness and capacity to deal with disasters, including floods. However, increasing public awareness must be accompanied by strengthening institutional capacity and information systems that are easily accessible and understood by the community (Triyanti, et.al. 2017). Likewise, communication-related to risk is seen as effective in building awareness and increasing community resilience to disasters including floods (Paton, 2015). Communication will occur in disaster education activities in schools and communities to increase flood awareness (Syamsidik et al, 2020). Therefore, it is important to have community understanding and community participation in designing effective mitigation strategies (El Naggar & Abdelrazik, 2024). However, it must also be understood that even though the community is aware of the risk of flooding, there is a need to increase active participation in disaster mitigation and preparedness efforts (Priyanti, et.al. 2019). So that community

involvement can be carried out in the planning and implementation of a sustainable flood mitigation strategy (Nugraheni, et.al. 2022).

The problems faced in improving the ability to handle floods are related to community participation and local wisdom (Sedyowati, et.al, 2021). Community participation has an important role in the effectiveness of the implementation of disaster risk reduction policies (Yuwanto, et.al. (2021); likewise, the synergy between the government and the community in disaster risk reduction is essential (Hanifa, et.al, 2019). This is largely due to the communication carried out not being by the culture of the community, as well as the lack of the role of government leaders to actively disseminate information related to disasters (Marlowe, et.al. 2018). Community involvement in government programs for disaster management is also related to local culture or local customs. This can be seen in community involvement in focus group discussions, development planning can be more acceptable and effective in the local context (Saadi, 2022).

To implement a strategy in a community or community group, it is mandatory to pay attention to cultural aspects or adaptation of local cultural values that exist in the community (Nurmillah, et.al. 2024). Nugroho & Jumanah (2024) understand that increasing the capacity of government officials, strengthening communication between the government and the community, and implementing technology are seen as core strategies for improving a service. However, it also turns out that changes that occur in social and technological interaction patterns, limited infrastructure, and digital literacy gaps are still obstacles to implementing a strategy in society, so it is important to involve and make the community a part of all government programs (Bahasoan, 2024). As a result, active community involvement in government programs can encourage an increase in the quality and speed of response from government agencies (Hendrarso, et.al. 2024).

Literature Review

Prihatin, (2018) stated that public awareness is still reactive; meaning it only arises when a disaster occurs. The main weakness is the lack of disaster education, low participation in simulation training, and high dependence on the government. However, on the other hand, some communities show high disaster awareness, and are proactive, with a strong disaster education system from an early age, and adequate infrastructure and mitigation technology support. Therefore, to increase public awareness in dealing with floods, active community participation, formal education, discipline, and integration of disaster awareness culture into daily life are needed. Presented important lessons regarding disaster awareness from three different contexts. That a disaster awareness culture can be formed and instilled systematically through education and community involvement can be used as a model to form a responsive, aware, and prepared society to face disasters, including floods. For further research, risk communication strategies, locally-based education, and strengthening community capacity can be further developed. Did not discuss in depth the risk communication strategy or the role of local media, does not focus enough on the aspects of information technology or early warning systems in building awareness, and does not review the differences between age segments or community groups in terms of awareness levels.

Rachmawati, et al (2018) in their study explained that many flood-affected areas in Indonesia do not pay attention to Regional Spatial Planning so settlements are built in flood-prone zones. In addition, minimal supervision and weak enforcement of spatial planning laws contribute to the vulnerability of areas to flood disasters. Therefore, ideal spatial planning must consider aspects of disaster-prone maps, drainage capacity, and

environmental carrying capacity as well as conservation zones and river boundaries. That areas that follow good spatial planning rules tend to be more resilient to disasters. An important understanding of how spatial planning plays a major role in reducing the risk of disasters, including flooding. In the context of increasing public awareness, the results of this study can be used as a basis for encouraging public education about the importance of spatial planning and land use according to its designation. That way, the strategy of increasing public awareness of flooding can be directed not only at behavioral aspects but also at spatial understanding and the right to safe space. That public awareness can be formed through understanding spatial planning, people who understand the function of zoning and its potential risks will be more prepared and aware in dealing with floods. So it is seen as important for collaboration between local governments, spatial planners, and residents in building a sustainable disaster risk reduction system. Although Rachmawati, et al (2018) have not explored much about the role of the community in spatial planning supervision, aspects of risk communication and public education on spatial planning are still limited and have not discussed in-depth community-based strategies in flood risk reduction.

Widjanarko & Minnafiah's (2018) research reinforced the idea that disaster education plays a very important role in shaping disaster response and preparedness behavior. In the context of flood-prone areas, these results are an important basis for integrating flood and mitigation materials into the school curriculum. Public awareness can be formed earlier through the younger generation, as agents of change who will transmit risk-aware attitudes to their surroundings. This research is very relevant to the topic of public awareness of floods because it provides evidence that disaster education can increase public awareness and preparedness from an early age, become an important basis for school-based awareness programs in flood-prone areas, and can be applied to local curricula in flood areas as a strategy to form a culture of risk awareness. However, the study was only conducted in the short term (the long term has not been studied), has not seen an impact on the family environment or the wider community, and focuses only on high school students, not including other ages. However, from a study conducted by Widjanarko & Minnafiah (2018), it turns out that disaster education significantly influences changes in students' preparedness behavior. Being given disaster education material shows an increase in knowledge about types of disasters, an increase in the ability to make emergency plans, and a faster and more appropriate response in disaster simulations. So interactive learning and direct practice (such as evacuation simulations) are proven to be more effective than just theoretical learning.

Istiqomah (2019) proved that local media has the power to shape public awareness of disasters. In the context of flood disasters, informative, educational, and contextual news can accelerate understanding and encourage preventive actions by residents. This strengthens the idea that strategies to increase public awareness must involve the media as educational partners, not just as post-disaster information providers. Regarding increasing public awareness of flood disasters, Istiqomah (2019) explained that mass media can be an effective risk communication tool, especially in disseminating preventive and responsive information. It is important for the quality and intensity of news coverage to shape risk perceptions and public preparedness so that mass media can be used as a reference in designing public campaigns or media education for communities in flood-prone areas. On the other hand, the role of local media, which is often the closest information bridge to grassroots communities. That disaster reporting in local media has a positive and significant influence on public awareness. The more often and intensively

people read news related to disasters, the higher their level of alertness and preparedness. The most influential elements are the depth of news content, visualization (photos/pictures), and the clarity of practical information, such as anticipatory steps and emergency contacts. This makes the mass media play an important role as a source of education and indirect early warning for the public, especially in disaster-prone areas.

Rahayu, et al. (2023) in their study explained that direct environmental education to the community is an effective strategy in increasing awareness of disaster risks, including floods. The community-based approach carried out by Rahayu et al. provides a concrete example of how to build awareness through real and collaborative action. This is very appropriate to be applied in flood-prone areas as part of a strategy to build local community resilience. Before the education program, the community had a low level of awareness of the relationship between environmental damage and natural disasters. After educational activities and environmental management training (such as tree planting, waste management, and land conservation) were carried out, there was an increase in understanding and active attitudes of the community in protecting the environment and residents also began to be involved in cooperation activities and monitoring the surrounding environment. Public awareness grows when they are given a practical and relevant understanding of local conditions. That awareness of floods can be formed through an environmental management approach and environmental education has proven to be an effective entry point for forming a risk-aware attitude, including flood risk. So disaster risk reduction does not only depend on infrastructure but also community awareness and behavior.

Sriharini (2010) enriches the understanding that building a disaster-aware society is not only about technical and infrastructure matters, but also requires a social, cultural, and religious approach. In the context of flood disasters, local preaching and communication strategies are important bridges to instill the values of preparedness and risk response more touchingly and sustainably. Public awareness of disasters is not only formed by technical information, but also by social, cultural, and religious approaches. Religious figures, traditional leaders, and preaching media can be strategic agents in conveying disaster mitigation messages. Effective and participatory communication is very important, especially if packaged in local languages and symbols that are easily understood by the community. Disaster education must be carried out continuously, not only when a disaster occurs. From Sriharini's study (2010), it turns out that there is an increase in awareness of flood disasters, especially in areas with high social capital and religiosity.

One alternative strategy for flood mitigation socialization is through a cultural, religious, and local values approach. Sriharini's findings (2010) can be applied in flood-prone areas with the active involvement of community leaders and religious organizations as drivers of education. Efforts to increase disaster awareness according to Astuti (2013); and Widjanarko and Minnafiah (2018) can be executed through disaster education. Also done through news using the media to inform and educate the public to be aware of disasters (Istiqomah, 2019). Forming a community-based disaster response community (Rahayu, et al. 2023) and conducting preparedness exercises (Prihatin, 2018). However, until now, increasing public awareness of disaster risks has not been as expected and has ultimately resulted in a large number of fatalities and loss of property (Hardy, et al. 2020). The gap in this study can be examined through strategies to increase public awareness. Each region has its special characteristics and uniqueness about disasters. The dynamics and socio-economic conditions of the community and regions are also very different. So it is

very difficult to apply the same pattern in increasing public awareness of the dangers of disasters.

The facts of the problem above clearly show the importance of reviewing the handling of natural disasters such as floods through increasing public awareness. Recently, the efforts to increase public awareness are still a problem faced by the government. This study was conducted to find a strategy to increase public awareness of flood-prone areas in Manado City, North Sulawesi Province in the study of public administration science. Through the implementation of this study, it is hoped that strategies can be found that can be carried out to increase public awareness of flood-prone areas in Manado City, North Sulawesi Province. The findings of this study can also be used as scientific recommendations for the Manado City government in making policies related to flood management.

RESEARCH METHODS

This study uses a qualitative design with a case study approach. The selection of a qualitative design aims to obtain in-depth, accurate, and contextual data and information to fully understand the social phenomena related to strategies for increasing public awareness in flood-prone areas. This design allows researchers to explore in detail the social symptoms that occur in the field, by focusing on the real situation and behavior of social actors in the local context.

The case study approach was chosen because this study only focuses on one specific location, namely Manado City, which is known as one of the areas with a high level of vulnerability to flooding. This study proposes to reveal the right strategy model for increasing public awareness of the threat of disaster, through an in-depth study of one particular case by considering the local social, cultural, and institutional context.

To keep the direction of the research focused and systematic, the scope of the problem is limited to five main aspects, namely: education, training, coordination, dissemination of information and communication, and the formation of disaster response communities. These five aspects are examined from the dimensions of knowledge, attitudes, actions, and community awareness of flood risks.

Data collection was carried out by:

1. Conducting interviews with:
   a) Leaders and Staff at the North Sulawesi Province Disaster Management Agency.
   b) Leaders and Staff at the Manado City Disaster Management Agency.
   c) Representatives of the community in 10 sub-districts with 48 villages which are flood-prone areas in Manado City
2. Direct observation to 10 sub-districts with 48 villages which are flood-prone areas in Manado City.
3. Secondary data collection Secondary data collection was carried out directly while at the Provincial/City of the Regional Disaster Management Agency and conducting searches via Google Scholar and Google Scholar.

Data obtained from interviews, observations, and documents were analyzed inductively, namely the interpretation of the meaning contained behind the data based on the social context and experience of the subject. The analysis was carried out through three main stages as stated by Miles and Huberman (Sugiono, 2020), particularly data reduction, data display, and conclusion drawing/verification. To increase the validity of the analysis results, the researcher also held a

focus group discussion with several informants to re-examine the findings and interpretations that had been obtained.

RESULTS AND DISCUSSIONS

Manado City is the capital of North Sulawesi Province located in the northern part of Sulawesi Island. Geographically, the city is directly adjacent to the Sulawesi Sea, North Minahasa Regency, and Minahasa Regency. Manado has an area of approximately 157 km² and is divided into 11 sub-districts. The area consists of coastal areas, hills, and valleys crossed by many rivers (Tondano River, Sario River, Tikala River, and Bailang River. Manado City is located in a lowland area surrounded by hilly areas. This makes rainwater easily flow from high areas and collect in the city center. Manado City has a tropical climate with quite high rainfall, especially from November to March (rainy season). This condition makes Manado very susceptible to flooding; especially flash floods that occur when rainfall is high and rivers overflow. The causes of flooding in Manado City are related to natural and non-natural factors. Natural factors include high annual rainfall, basin topography that causes water to be retained in the city center, and narrow river flows that easily overflow during heavy rain. Non-natural factors include land conversion: Many infiltration areas have been transformed into residential and commercial areas, settlements on riverbanks, which narrow the river body and increase the risk of flooding, and a poor city drainage system, unable to drain rainwater effectively or piles of garbage in gutters and rivers that block the water flow.

The frequent flooding in Manado City, has an impact, among others, related to economic losses in terms of damage to houses, infrastructure, and vehicles of residents. Also, disruption of residents' activities such as schools and offices are often closed during major floods. In terms of health, it has an impact on the potential spread of diseases such as diarrhea and skin diseases. One of the major floods that attracted national attention occurred on January 14, 2014, when flash floods hit most of Manado, causing thousands of houses to be damaged and thousands of residents to be displaced. The Manado City Government together with related agencies such as the Regional Disaster Management Agency, the Public Works Agency, and the Environmental Agency have made several efforts, such as normalizing rivers (dredging and widening), controlling illegal settlements on riverbanks, making and repairing city drainage channels, installing an early warning system and educating and involving the community in environmental management. However, the challenges are still great, especially in changing people's behavior, such as littering and building in red flood zones. Manado City has great potential to develop but also faces a fairly high risk of flooding. The problem of flooding in this city is complex because it is influenced by natural and human factors. Therefore, flood management strategies must be comprehensive, involving aspects of spatial planning, infrastructure, education, and active community participation.

The Manado City Regional Disaster Management Agency as a regional technical institution has responsibility for disaster management. Manado City is an area prone to flooding. Of the 11 sub-districts with 87 villages, there are 10 sub-districts with 48 villages that are areas prone to flooding. To anticipate flooding, a disaster-aware community is needed. The disaster-aware community in question is a community that knows, shows attitudes and behaviors takes preventive actions, and can avoid flooding. Real manifestations are seen in the actions to prevent and anticipate flooding.

The government through related agencies has carried out various programs to make the community disaster-aware. However, with many people still being victims and affected by the flood disaster in Manado City, it shows that there is still a lack of public awareness in preparing

early in the process of prevention and handling after the flood. So efforts are needed as a strategy to increase public awareness.

As a follow-up to the results of the joint agreement of the international community to build national and community resilience to disasters, Indonesia has formed a National Action Plan for Disaster Risk Reduction. This action plan contains five priority actions that must be carried out, namely those related to (Sriharini, 2010):

1. Placing disaster risk reduction as a national and regional priority and its implementation must be carried out by a strong institution.
2. Identifying, and assessing disaster risks and implementing an early warning system.
3. Utilizing knowledge, innovation, and education to build a culture of safety and resilience at all levels.
4. Reducing the scope of disaster risk.
5. Increasing disaster preparedness at all levels, so that the response is more effective.

The five priorities for disaster risk reduction contained in the national action plan above are a strategic foothold for building a culture of society that cares about disasters. The community that is expected to know understand and care about disasters is a community that is aware of the dangers of disasters (Sriharini, 2010). Strategy in Greek "Strategos" which means military expertise and is understood as a bridge that connects policies with targets. So that strategy is a concept related to the network to develop a framework to decide and take action in achieving goals (Ginting & Simamora, 2020).

The study related to the concept of awareness will include perception, thoughts, and feelings. In the theory of consistency (awareness), three indicators of knowledge, attitude, regulation, or feelings are put forward. Benjamin Bloom's theory (Lafendry, 2023) divides human behavior into three domains, namely cognitive, affective, and psychomotor. However, in its development, Benjamin Bloom's theory ((Lafendry, 2023) was modified into knowledge, attitude, and practice (Action). A disaster-aware society is described as a condition of society that has knowledge, understanding, skills, and concern for matters related to disasters. So that they have the awareness to behave and adapt in disaster-prone areas as well as possible, and can actively participate in minimizing the occurrence of disasters or overcoming the impact if a disaster occurs.

To build a society or community that is aware of disasters, disaster education is a fairly important and strategic entry point. Disaster education can be implemented through formal, non-formal, or informal education. Disaster education as an effort to build a disaster-aware society has a fairly broad dimension of study, and in its implementation, it is necessary to pay attention to methods, appropriate media and need to establish cooperation with other parties who have the same mission, to achieve a participatory society in managing disasters. With disaster education, it is hoped that the shared ideals of the Indonesian people and the world community can be realized so that they can enjoy a safer, more peaceful, and prosperous life (Sriharini, 2010). However, there is also preparedness training as a form of coordination, communication, and evacuation training by involves all stakeholders (government and community) so that they can improve skills in coordinating and implementing disaster management operations. Equipping the community with increased knowledge, skills, and awareness of disasters, will increase the basis for planning (Prihatin, 2018). Increasing awareness of disasters can be done through disaster education, and news using the media to inform and educate the public to be aware of disasters. It is also done by forming a community-based disaster response community and paying attention to local cultural conditions. Conducting preparedness exercises followed by coordination, communication, and evacuation by involving all stakeholders (government and

community) to improve skills and coordination as well as in implementing disaster management operations. Equipping the community through increasing knowledge, skills and awareness will have an impact on increasing disaster awareness (Prihatin, 2018).

Based on the results of interviews, observations, and secondary data collection conducted in 10 sub-districts and 48 flood-prone villages in Manado City, it was found that the strategy for increasing public awareness of the risk of flooding still faces various challenges. In general, public knowledge about the potential and impacts of flooding is quite varied. Some residents understand the risk of flooding in general but do not yet know in detail about the appropriate mitigation and emergency measures.

In terms of education and training, it is known that the socialization program organized by the Manado City BPBD has been carried out periodically, especially before the rainy season. However, community participation in these activities is still low, especially in densely populated areas. Disaster simulation training has been conducted in several schools and community groups but has not been evenly distributed across all sub-districts. The coordination and communication aspects between institutions (Provincial BPBD, City BPBD, sub-districts, and community leaders) show synergy, although not yet optimal. In emergency conditions, coordination tends to be reactive rather than proactive. On the other hand, early warning systems are available at several points, but have not been fully integrated and are not always understood by the community.

In terms of information dissemination, social media is the main channel used by BPBD to convey disaster information. However, access to information is still an obstacle in several areas with minimal signal or limited devices. This causes delays in delivering information to residents, especially those who are vulnerable such as the elderly or people with disabilities.

Regarding the formation of disaster response communities, it was found that in several sub-districts, local disaster volunteers have been formed. This community is active in educating and assisting the community. However, the existence and role of this community are not uniform in all flood-prone areas and still require capacity building and institutional support.

From the aspect of changing attitudes and actions, it was found that people who had experienced flooding tended to have higher alertness. They showed preventive behavior such as raising their houses, preparing emergency bags, and maintaining the cleanliness of water channels. On the other hand, people who had not been directly affected tended to be passive and did not have adequate preparedness.

The government has carried out disaster education in the form of training and socialization. Disaster education through socialization and training activities is carried out to equip the community with disaster knowledge. What causes disasters to occur and how to anticipate them so that when disasters occur, they will not claim material and non-material victims? Disaster education through socialization and training is carried out by the Manado City Regional Disaster Management Agency through cooperation with other government agencies, the private sector, and social organizations. Until now, there has been a lot of socialization for civil servants/private sector, students, pupils, and community groups. Training and socialization are carried out in government offices, schools/campuses, and even in private offices such as companies and banks. Efforts to increase public awareness of flood disasters in particular and disasters in general are also carried out through news using mass media, social media, and new digital-based media. News through various media aims to disseminate information to the general public related to knowledge and important things about disasters. The dissemination of this information is to inform and educate the public to be aware of disasters.

Meanwhile, efforts to raise public awareness of flood disasters in Manado City have not been carried out in the form of forming or directly involving community-based disaster response communities and conducting preparedness training. This is due to the lack of community-based disaster response communities in Manado City and the lack of support, advice, and budget for preparedness training. The government through the Manado City Regional Disaster Management Agency selects civil servants/private sector employees, students, and community groups. Training and socialization are carried out in government offices, schools/campuses, and even in private offices such as companies and banks as targets for disseminating information and implementing disaster training which is not seen as the right strategy for increasing public awareness.

The flood problem mostly occurs in communities living in lowland areas, communities living in areas on the banks of rivers or around river basins, and communities living around the coast. Thus, it can be seen that the community groups living around river basins and coastal areas are communities who work as traders, fishermen, and even casual workers. Not the office workers as the target of training and socialization activities carried out so far. Efforts to raise public awareness regarding flood disasters through socialization and training are expected to form knowledge, attitudes, and practices/actions. Knowledge, attitudes, and practices/actions can be seen in communities that are often hit by flood disasters, not office workers, and do not live in flood-prone areas. Communities that are categorized as disaster-aware are communities that in a condition or situation have knowledge, understanding, skills, and concern for matters related to disasters. In their daily behavior, they do not cut down trees carelessly, do not deforest, do not litter carelessly, do not build houses beyond the rules related to riverbanks, and do not build houses/buildings on riverbanks.

The attitudes and actions above are a manifestation of a disaster-aware community. So with the knowledge they have, they behave and adapt in disaster-prone areas as well as possible, and can actively participate in minimizing the occurrence of disasters or overcoming the impacts if a disaster occurs.

The results of the study indicate that increasing public awareness in flood-prone areas in Manado City is highly dependent on the effectiveness of education strategies, risk communication, and local community involvement. This finding is in line with participatory theory in disaster risk management, which states that a bottom-up approach—involving the community as the main subject—is more effective in building community resilience (Wisner et al., 2012).

The still limited scope of disaster education and training indicates the need for a more inclusive and sustainable approach. Training must be tailored to local characteristics, including language, culture, and community literacy levels. In addition, education programs need to focus on increasing awareness through participatory and community-based methods.

Communication and coordination between institutions must be strengthened through the establishment of fixed protocols and the involvement of all stakeholders, including religious and youth leaders. Disaster information systems need to be improved through technology that is easily accessible and understood by the community. In this context, the use of community radio, loudspeakers, and short message systems can be used as alternatives to reach groups that have difficulty accessing digital information.

The formation of disaster response communities is also a key to creating local resilience. These communities not only function during disasters but also in building a culture of risk awareness and cooperation. Local governments can strengthen these communities through regular

training, budget support, and formal recognition of their roles. Thus, increasing public awareness of flood risks is not only a matter of conveying information, but also about building responsive, collaborative, and sustainable social structures. This study recommends the need to develop a participatory-education-based strategy model supported by an effective communication system and active involvement of local communities.

Table2.
Research Results: Strategies to Increase Public Awareness of Flood Risk in Manado City

No	Research Aspects	Findings	Strategic Notes
1	Community Knowledge	Public knowledge of flood risk varies; Some do not understand the proper mitigation measures.	Intensive education and participatory methods based on local communities are needed.
2	Education and Training	Socialization has been carried out by BPBD ahead of the rainy season, but participation is low.	Involve community leaders, focus on flood-prone areas, use local media.
3	Inter-Agency Coordination and Communication	There is already synergy but it is not optimal and tends to be reactive.	Build a fixed protocol, active involvement of all stakeholders.
4	Early Warning System	It is available at several points but has not been integrated and has not been understood by the public.	Improve the system, educate the community, use local technology that is easy to understand.
5	Information Dissemination	Social media is dominant, but some areas are constrained by signals and devices.	Use community radios, loudspeakers, and text messages as alternatives.
6	Disaster Response Community	It has been formed in several villages, but it is not evenly distributed and still needs strengthening.	It requires regular training, budget support, and formal recognition.
7	Changes in Attitudes and Actions	Residents affected by the flood show preventive behavior, while those who have not been affected tend to be passive.	Build collective awareness and education on the importance of preparedness.
8	Socialization and Training Targets	So far, it has targeted ASN, students, and the private sector; Less targeting vulnerable groups.	Focus on vulnerable communities on riverbanks and coasts, such as traders and fishermen.
9	Disaster Education Strategy	It has been carried out in the form of socialization and training, but it has not touched all levels of society.	A formal, non-formal, and informal approach is needed that is sustainable.
10	Recommended Strategy Models	The top-down approach is still dominant.	Use a community-based participatory educational-model to increase local resilience.

Source: Researcher's Analysis, 2025

CONCLUSION

A society with a high level of awareness of the dangers of disasters is needed to support government programs in the field of disasters. Manado City, which is a flood-prone area, requires a real presence and role to participate together with the government in minimizing and overcoming the impacts of floods. Socialization and training as well as the dissemination of information through print and electronic media are the government's choices as a strategy to

increase public awareness of floods in Manado City. The office community (civil servants/private sector), students, and university students are the targets of these socialization and training activities. The continued discovery of material and non-material victims when floods occur and behavior that is less supportive of preventing floods, shows that the strategy set and carried out by the government is not yet appropriate. The biggest mistake occurs in the inaccuracy of the strategy for determining target groups and the form of socialization and training activities. The communities that are often affected by floods in Manado City are those who live in river basins, lowlands, and coastal areas. The communities that live in these areas are generally freelancers, traders, micro and small business managers, and fishermen. This is not by the target groups that have been targeted by the government so far in socialization and training activities. Likewise, the form of training and socialization based on lectures that are carried out does not make the target group understand quickly and accurately. This study shows that the strategy of increasing public awareness of the risk of flooding in Manado City still requires strengthening in various aspects, both in terms of education, training, inter-agency coordination, communication systems, and the formation of disaster response communities. Although several initiatives have been implemented, their implementation is not evenly distributed and has not fully reached all communities in flood-prone areas.

Community participation in education and training programs is still relatively low, due to limited access, information gaps, and the lack of a strong risk awareness culture. Coordination between institutions tends to be reactive, while the disaster information dissemination system has not been effective in reaching vulnerable groups. Meanwhile, the formation of disaster response communities shows great potential as the vanguard in building local resilience but requires ongoing capacity and policy support.

Thus, increasing community awareness cannot be done partially. A comprehensive, integrative, and community-based approach is needed, so that flood disaster management efforts become more effective and sustainable.

To improve it, determining and implementing the right strategy to increase community awareness in flood-prone areas can be done by:

1. The local government through Disaster Management Agency needs to expand the reach of disaster education programs evenly to all flood-prone areas, with participatory, contextual, and community-based methods.
2. The disaster information dissemination system needs to be improved, both through the use of digital technology and conventional methods such as local radio, loudspeakers, and community-based warnings, to reach all levels of society, including vulnerable groups.
3. It is necessary to establish a structured and sustainable coordination mechanism between the Regional Disaster Management Agency Province, City, sub-districts, and social community institutions to ensure a fast and effective response before, during, and after a disaster.
4. The government and partner institutions need to support the establishment and strengthening of disaster response communities at the sub-district level, through training, funding, and formal recognition of their existence and role.
5. It is necessary to develop a participatory-based awareness-raising strategy model that can be used as a reference in planning and implementing disaster management policies in flood-prone areas, especially in Manado City.

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