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Level Of Community Vulnerability in Facing Climate Disaster Risks in Gili Gede Indah Village, West Lombok Regency

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ABSTRACT

The purpose of the research to be conducted is to identify the variety of climate disasters faced by the community and analyze the level of community vulnerability in facing the risk of climate disasters in Gili Gede. The research method for the level of vulnerability in facing the risk of climate disasters is to use descriptive research. The research location is Gili Gede Indah Village, Sekotong District, West Lombok Regency, West Nusa Tenggara Province. Gili Gede is one of the small islands in West Lombok and is the only island village. The sampling technique uses purposive sampling with the distribution of respondents for Gili Gede Hamlet and Orong Bukal Hamlet, with 36 respondents each. The first activity to be carried out to analyze the data in this study is to conduct a climate vulnerability assessment using a rapid climate risk assessment - Risk Claim Rapid Assessment (RCRA). The data is then analyzed through four stages of activity: determining the scale of possibility, measuring the scale of consequences, determining the level of danger, and the scale of disaster priorities. The study results show that in the Gili Gede Indah area, there are various potential disaster threats, namely hydrometeorological threats consisting of high waves, tidal floods, droughts, and strong winds. Each of these threats has different characteristics and levels of danger, but all can potentially cause significant impacts. Next, the level of vulnerability of the Gili Gede community to hydrometeorological threats is at a medium-high level. This condition shows that the local community has limitations in dealing with the impacts caused by these types of disasters, but is not completely vulnerable significantly.

Keywords: Vulnerability Level, Community, Risk, Climate Disaster

INTRODUCTION

Based on Law No. 31 of 2009 concerning Meteorology, Climatology, and Geophysics, climate change is caused directly or indirectly by human activities that cause changes in the composition of the atmosphere globally and changes in natural climate variability observed over comparable periods". Climate change is a long-term change in the average weather patterns that determine the local, regional, and global climate of the Earth. These changes have far-reaching impacts. Since the mid-20th century, Earth's climate has been driven by human activity, particularly the burning of fossil fuels, which has led to increased levels of heat-trapping greenhouse gases in the Earth's atmosphere, increasing the Earth's average surface temperature. Natural Earth processes also contribute to climate change, including internal variability (e.g., ocean cycles such as El Niño, La Niña, and the Pacific Decadal Oscillation) and external factors (e.g., volcanic activity and variations in Earth's orbit) (https://climate.nasa.gov/what-is-climate-change/).

Climate risk can be broadly defined as the potential negative impacts caused by climate change on life (Morris et al., 2022). The impacts of climate change are greatly felt by communities, especially farmers and fishermen who live in coastal areas and small islands. Fishermen and coastal communities are also threatened by rising sea levels of up to 5-10 mm/year resulting in tidal flooding, coastal abrasion, extreme

weather storms, droughts and heat waves, loss of livelihoods, reduced quality of health and well-being, damage to ecosystems and species on land and sea, loss of economic, social and cultural assets, services (including ecosystem services) and damage/loss of infrastructure. With so many impacts, this shows that coastal areas are highly vulnerable to disasters due to climate change.

Life in all sectors is threatened by extreme climate disasters, on the one hand, the population is increasing and is directly proportional to the production of waste and waste, causing degradation and reducing environmental carrying capacity, so efforts are needed from the community in dealing with climate disasters. The efforts made can at least reduce the risk of disaster. There are various efforts for community mitigation and adaptation measures carried out by the community, including for coastal areas through the development of facilities and infrastructure, improving the quality of human resources through disaster training and involving women to participate in the participatory decision-making process; construction of flood retaining walls, planting coral reefs and expanding mangrove areas, and independent community preparedness in the event of a disaster.

Regarding the sea level rise projection, a study has been conducted on sea level rise projections for the Indonesian region. The results of the projections show that the Indonesian region is experiencing land loss due to sea level rise. If the projection results for 2010, 2050, and 2100 are taken, the land area lost is 7,408 km^2, 30,120 km^2, and 90,260 km^2, respectively (Susandi et al. 2008).

Climate change will also have an impact on the small islands in Lombok Island, especially Gili Gede. Gili Gede, which is a coastal area based on Law No. 27 of 2007, is a small island. Gili Gede Island is located in Gili Gede Indah Village with an area of 308 Ha (Gili Gede Indah village profile, 2023) including small islands that have a very high risk of disaster with climate change. Climate changes that are felt include rising sea levels, changes in sea surface temperatures, changes in seawater acidity, increased frequency and intensity of extreme climates, abrasion, and reduced coastal boundaries due to tidal waves/floods and drought.

Disasters due to climate change on Gili Gede based on initial surveys in the field, coastal abrasion disasters have occurred, and the coastal boundaries are decreasing and continue to increase every year, thus disturbing the people living in coastal areas. However, until now there has been no action or policy from the village government and local communities to mitigate climate disasters.

The purpose of the research is to identify the various climate disasters faced by the community and to analyze the level of community vulnerability in facing the risk of climate disasters that occur in Gili Gede.

LITERATURE REVIEW

Vulnerability

Vulnerability in its general sense refers to the potential for loss. However, vulnerability is often identified and defined through a specific sectoral or thematic perspective, for example focusing only on the environment, food security, gender, etc. In building Urban Climate Change Resilience (UCCR) - city resilience to the impacts of climate change, it is necessary to define the concept of vulnerability from the perspective of the target or in this case the affected community. This is needed so that the community can later be involved and understand what challenges they face. Moreover, the threat of climate change can vary in each city so each region has different vulnerability issues and cannot be equated with other regions.

According to the IPCC (2021), climate disasters are events caused by extreme climate change and their impacts on human life, the natural environment, and the economy. The National Climate Change Research Center (NCRC) states that climate disasters are adverse events or series of events caused by extreme climate change, such as floods, droughts, storms, and rapid sea level changes.

In the context of climate change, IPCC (2007) defines vulnerability as the degree to which a system is vulnerable to and unable to cope with, the impacts of climate change, including those related to climate variability and extreme climates. The context of vulnerability can be seen at different scales and aspects in society such as households, neighborhoods, cities, countries, and economic or social sectors. More simply, vulnerability can be defined as the physical, social, and economic conditions in an area that may be affected by climate change hazards.

Vulnerability according to IPCC (2014) is the tendency to be affected by negative impacts/losses. Vulnerability encompasses various concepts including sensitivity, exposure to hazards, and lack of capacity to cope and adapt.

Vulnerability is the tendency or possibility of being adversely affected. Vulnerability encompasses a range of concepts and elements including sensitivity or susceptibility to hazards and lack of capacity to cope and adapt to existing situations (Morris, 2019). Vulnerability consists of three components: exposure, sensitivity, and adaptive capacity. In the illustration example above, a high slope area indicates the exposure component, housing type indicates the sensitivity component, and income level & public facilities indicate the adaptive capacity component.

Vulnerability (V) = f (E, S, AC)

Exposure Component (E), is highly dependent on geographic function based on climate variations that can cause disasters. For example, people living on hillsides are more vulnerable to landslides, while those living on the coast have a higher chance of exposure to rising sea levels.

Sensitivity Component (S), is the extent to which a city is affected by disasters due to climate change. The impact can be directly felt by the community but some are not directly felt. For example, communities living along the riverbank have different types of housing; some have semi-permanent houses made of wood and zinc, while others have permanent houses made of stone and brick. The semi-permanent type of house is more vulnerable (sensitive) because it is more easily carried away by flood currents.

Adaptive Capacity (AC) component, is the ability of a city to adapt to climate change by reducing potential damage, utilizing existing resources and opportunities, or coping with its consequences. For example, residents with high income levels will have a greater capacity to cope with the consequences and respond to climate change or after a climate disaster occurs.

Climate Risk Assessment

Before data collection is carried out, the scope of the analysis is important to be formulated. Cities with high levels of complexity need to consider the vulnerability of the city whether the city already has the capacity and funding or not. Climate risk assessment can be called the foundation of urban climate change resilience research, which can be revised annually as needed. Understanding building UCCR will increase the justification for implementing climate change mitigation and adaptation actions in development and also mainstreaming in the scope of government.

Given that there are several method options in completing climate risk assessments, ranging from simple climate risk assessments to more detailed and in-depth levels, districts/cities need to adjust the method chosen to the conditions of the city itself. This depends on the resources owned by the city including human resource capacity, time availability, data availability, and the level of interest in compiling an in-depth analysis. Climate risk assessments can be informative at certain levels, no matter how simple they are. Although starting with a community-based assessment, the lessons learned can be applied at the city level. Sectoral assessments can also lead cities to achieve the same goals.

The preparation of a climate risk assessment will depend largely on the size of the city and the type of information available. The assessment can be conducted at different scales, such as at the sub-district or village level. Choosing one scale over another will greatly affect the type of analysis and the type of conclusions that can be drawn from the assessment. One of the best ways to decide on the scope and method to be chosen is to evaluate the size of the city; in the case of small cities, with few sub-districts, it is better to conduct the assessment at the village level. If the city is very large, with many villages, the best option is to conduct the assessment at the sub-district level. There are a variety of approaches and techniques for climate risk assessment ranging from assessments based on national or global indicators to participatory approaches at the local level. All have different functions and purposes but can be used as long as they meet the main objectives and needs of the city from the climate risk assessment (IPCC, 2012). Quantitative approaches to

assessing risk need to be complemented by qualitative approaches to look at the complexity and tangible and intangible aspects of risk from different dimensions. Complex systems that encompass many variables (physical, social, cultural, economic, and environmental) need to consider a variety of relevant and integrated methods.

METHODS

The research is a descriptive method. The descriptive method is research that aims to describe facts or phenomena obtained from data as they are (Sugiyono, 2017). The research location is in Gili Gede Indah Village, Sekotong District, West Lombok Regency, West Nusa Tenggara Province. Gili Gede is one of the small islands in West Lombok and is the only island village that was formed in 2010 (Gili Gede Village Profile, 2023). This village does not yet have a system/policy from the local government in dealing with the impacts of climate change and the lack of public attention to environmental, social, and physical conditions that are very vulnerable to the risks of climate change.

The sampling technique used purposive sampling with the distribution of respondents for each hamlet as follows:

Table 1. Distribution of the Number of Respondents in Each Hamlet

Name of Hamlet	Number of HF	Respondents
Gili Gede	131	36
Orong Bukal	123	36
Amount	254	72

So the number of respondents to be interviewed in Gili Gede Hamlet and Orong Bukal Hamlet is 36 respondents each. The respondents interviewed consist of various elements of society, namely fishermen, farmers, livestock breeders, home industry craftsmen, street vendors, wholesalers, retailers, restaurants, private employees, non-civil servant government employees, craftsmen, construction workers, mechanics, traditional medicine services, sea transportation services, collectors and fish fryers.

The first activity that will be carried out to analyze data in the research on assessing the level of community vulnerability in facing climate disaster risks is to conduct a climate vulnerability assessment using a rapid climate risk assessment - Risk Claim Rapid Assessment (RCRA). "Climate Risk Assessment - This Climate Risk Assessment (CRA) is a guide to assessing the vulnerability of an area, the climate hazards faced, and the risks that are owned as a result of climate change. (ACCCRN, 2015)".

Climate risk assessment begins with collecting and analyzing data to form a framework and context for assessment and also assess current vulnerability conditions,

In data analysis, 4 stages of activity were carried out, namely:

1. Determining the Scale of Possibility
2. Consequence Scale Measurement
3. Determination of Hazard Level
4. Disaster Priority Scale.

RESULTS AND DISCUSSION

Identification of Diversity and Potential Disasters/Threats

Interviews and Focus Group Discussions (FGD) conducted during the research produced information on the diversity and potential of climate disaster threats. These threats cause various impacts on the condition of natural resources, property, infrastructure, and people's lives, the impacts identified are as follows:

1. Increasing air temperatures over a long period results in water shortages.
2. Rising sea temperatures are a result of rising air temperatures. Rising sea temperatures result in reduced catches because fish prefer deep waters that are relatively cooler than shallow waters.
3. Strong winds damaged fish traps and prevented fishermen from going to sea.

4. The increasing size of sea waves means that fishermen cannot go to sea, thus reducing their income.
5. The increasing current speed causes floating net cages (KJA) and nets (and other fishing gear) to be easily swept away by the water.

Based on this information, researchers found the types of threats that occurred in Gili Gede Indah Village, namely hydrometeorological threats. The types of hydrometeorological threats are arranged in Table 2 below.

Table 2. Types/Varieties of Hydrometeorological Threats in Gili Gede Indah

No	Hydrometeorological Disasters	Intensity of Events
1	Tidal Flood	Occurs in May – June every year, with a frequency of 6-8 times a month.
2	Tidal Wave	Occurs every month during the new and full moon with a frequency of 24 times (2-3 days)
3	Drought	Generally occurring in May–October (minimum 6 months) every year, the duration and intensity of the dry season can vary from year to year depending on global climate phenomena such as El Niño which can extend the dry season or increase the intensity of drought.
4	Strong winds	Occurs during the dry season, especially between July and September. In general, strong winds may occur about 5-10 times a month, with intensity varying from moderate to high, depending on weather conditions.

Source: Researcher Analysis Results (2024)

Flood Disaster Risk Assessment Rob

Based on the results of the analysis using disaster risk assessment instruments, natural/environmental and social, cultural, political, and institutional risk assets can be identified. Natural/environmental assets in the form of risks that can be identified are the death of trees/plants in residents' yards which reduce the beauty/naturalness of the residential and hotel environment located on the coast. The number of trees and plants that died due to seawater inundation was identified as 50-100 trees and grass that were deliberately maintained to add to the natural beauty of the environment. In social, cultural, political, and institutional assets, the impact of tidal flooding is disruption of public service access, water entering and inundating residents' yards and hotels reaching 30 m.

High Wave Disaster Risk Assessment

Based on the results of the analysis using the Disaster Risk Assessment Instrument, several forms of risk that occur affect human assets. In human assets, the main risks identified are sea accidents and fishermen being unable to work. Sea accidents threaten the lives of fishermen, where it was recorded that around 20 people had accidents, namely drowning or injuries, causing trauma to fishermen and their families in the last 10 years, all victims were fishermen. The main factor causing this sea accident is extreme weather conditions. However, on the other hand, fishermen have high personal capacity, such as the ability to swim and save themselves, as well as a calm attitude in dealing with disaster conditions, which are important capital in dealing with these risks. According to the community, sea accidents are considered to have a high level of risk, especially because this situation often requires external assistance such as from the SAR or Tagana team to provide evacuation support.

Furthermore, in human assets, other risks from high tides/waves have caused 245 fishermen to be unable to work. The capacity of the community to reduce the risk of being unable to work is still limited; only

a small number of fishermen have alternative skills such as working as laborers or craftsmen. So it can be concluded that the level of risk in human assets is in the high category. In economic assets, the form of risk that occurs is loss of income and property. The risk of losing income if the waves occur for 3 days and the average income of fishermen is IDR 100,000 per day, then there is a loss of income of IDR 300,000/person available to reduce the existing risk is the attitude of cooperation and helping each other.

The risk of loss of property in the form of damage to valuable assets, especially boats that are the main means of livelihood for fishermen, namely boats that sink or significant damage to vital components such as engines and boat bodies. In the last 10 years, 30 boats have been recorded as experiencing such incidents, indicating a recurring risk to fishermen's assets due to extreme weather factors and technical conditions that can endanger the sustainability of their activities at sea.

The level of risk of loss of property faced by fishing communities, especially in the form of damage or loss of boat assets, is in the medium risk category. This shows that although incidents of loss or damage to assets still occur and have a significant impact on the sustainability of fishermen's economic activities, this risk does not reach a critical level that requires large-scale external intervention. However, the medium risk category still indicates the need for attention to mitigation efforts and improving preparedness, so that potential losses to valuable assets such as boats can be suppressed and do not increase to a higher risk in the future.

In physical assets or infrastructure, the form of risk that occurs is the erosion or damage to embankments in some coastal areas. The damage to these embankments has reached a length of around 1000 meters in the last 10 years. The main cause of the erosion of the embankments is the strong pounding of waves during extreme weather. The embankments that function as wave breakers experience degradation due to repeated pressure from sea waves, which has the potential to increase the vulnerability of coastal areas to abrasion and tidal flooding.

However, there is available funding capacity, in the form of village fund allocations that can be used for repair and maintenance of embankments or wave breakers. Based on the risk analysis, it can be concluded that the level of risk faced is in the moderate category so attention is needed in mitigation planning so that the impact of the damage does not develop further.

Another risk to physical assets or infrastructure is damage to buildings/facilities located in coastal areas which can be seen in Figure 1. In the image above, there are significant changes between 2018 and 2023 in the pool area which is a tourist facility for children in the shape of a turtle. In 2018, the pool was still intact and an attraction for children. However, in 2023 the pool was severely damaged due to extreme weather and strong waves, leaving only the remains of a turtle's head. Conditions worsened in 2024 when the pool disappeared completely. This incident caused the loss of assets with an estimated loss of 150 million rupiah. Based on this condition, it can be concluded that the level of risk to the threat of disasters on natural or environmental assets is in the high category.

Figure 1. Loss of Tourist Facilities in 2018, 2023, 2024
Source: Researcher's Personal Documentation (2018, 2023, 2024)

In natural or environmental assets, the form of risk faced is the collapse of trees that function as abrasion barriers, with a total of around 100 trees and many more trees that have the potential to collapse and be carried away by the current. The types of trees affected include young mangrove trees, waru trees, mengkudu trees, and several other types of trees that are vulnerable to extreme environmental conditions. The risk of damage is mainly caused by very strong waves when extreme weather occurs, causing the trees to fall or disappear, which can reduce natural protection against abrasion in coastal areas. The capacity of the community to deal with this risk has shown an increase, especially with the growing awareness of the importance of planting mangroves as natural barriers to abrasion. This awareness needs to continue to be encouraged and supported by various parties to increase the speed of rehabilitation of affected coastal areas. Based on this condition, it can be concluded that the level of risk to the threat of disasters on natural or environmental assets is in the moderate category, which requires ongoing attention in conservation efforts and strengthening environmental resilience to the impacts of disasters.

The form of asset risk on natural/environmental assets in the last 6 years has been a reduction in the shoreline/abrasion by 12 m, meaning that an average of 2 m of abrasion occurs per year due to the lack of mangrove forests and some areas have not been embanked which function as wave breakers and the soil structure is sandy and coral so that it is easy to abrade. To reduce the risk in the last 1 year the community has planted mangroves.

In 2018, the coastal boundary area marked by the outermost trees was about 10.5 meters wide. However, in 2023, the width of this boundary shrank significantly, leaving only about 1.5 meters, and the latest data in the field shows that the width of the boundary is now only about 0.5 meters. This significant shrinkage indicates a high level of abrasion risk and shows that the coastal area is increasingly vulnerable to the impacts of waves and extreme weather. This condition requires serious attention and immediate action from the authorities, both from the village government and related agencies outside the village, to address and prevent further damage to the remaining coastal boundary.

Drought Disaster Risk Assessment Assessment

Based on the Drought Disaster Risk Assessment Instrument, it was found that economic/financial risk assets were identified as many as 469 families experiencing additional expenses and those who felt the most impact were women because they had to manage finances that were tight/even lacking for daily life, the cause was the additional cost of buying water and for those who had livestock had to buy livestock feed from outside the island because local livestock feed was not available. The existence of the Mekar bank and the culture of helping each other can reduce the risk of this condition.

Natural assets/environmental risk forms that occur are groundwater pollution that occurs throughout 308 Ha caused by seawater intrusion. The community and government do not have the capacity to reduce the risk in handling this incident so it can be concluded that the risk level is in the high category.

In natural/environmental assets, the form of risk also occurs in clean water sources in the form of PAH and dug wells, residents experience drought in as many as 240 units, and women are the ones who feel the most impact because they have to look for clean water for washing, cooking. The capacity owned to reduce the risk of the availability of drinking water depots where to buy water. In natural/environmental assets, it can be concluded that the risk of the threat of drought disaster that occurs is at a moderate level.

In natural/environmental assets, another form of risk is the loss of animals in the last 10 years, as many as 10 cows and goats died due to the unavailability of feed caused by the death of livestock feed sources due to drought and the owner's ability to buy feed is low, so it is not uncommon for cows and goats to eat anything they find, such as plastic waste scattered around their environment. To reduce the risk, the owner buys livestock feed from outside the island. This incident can be concluded that the risk level is in the moderate category.

High Wind Disaster Risk Assessment

Based on the Disaster Risk Assessment Instrument, several estimates of the form of risk were found on assets. In human assets, the form of risk that occurred was that there were 245 people with professions as fishermen who could not work because they did not have work skills other than fishermen and lived in the archipelago. The capacity available to reduce the existing risk is that they remain physically healthy and have a positive mentality. In human assets, it can be concluded that the level of risk to the threat of the Strong Wind disaster that occurred was at a moderate level.

In the economic assets, the form of risk that occurs is that 245 people do not have income, all of whom are fishermen because they do not have work skills other than as fishermen. The capacity available to reduce the existing risk is that the community takes out loans from Mekar Bank. In economic assets, it can be concluded that the level of risk against the threat of strong winds that occurs is at the Medium level.

In physical assets/infrastructure, the form of risk that occurred was as many as 2 houses were severely damaged and 1 resident's kiosk was severely damaged due to the arrival of a tornado from the coast towards the land/residents' houses in the Gili Gede hamlet. The capacity available to reduce the existing risk is the existence of buildings that are resistant to tornadoes and high community cooperation and self-reliance. In physical assets/infrastructure, it can be concluded that the level of risk against the threat of strong winds that occurred is at the Medium level.

Level of Community Vulnerability

Based on the description, the level of community vulnerability in facing climate disasters that occur in Gili Gede can be identified as follows:

Table 3. Level of Community Vulnerability in Facing Disasters

Types of Threats	Risk Assets	Risk Level
Flood	Nature/Environment	Currently
Rob	Social, Cultural, Political, Institutional	Currently
	Man	Medium - High
Wave Mount/Height	Economics/Financial	Currently
	Physical/ Infrastructure	Currently
	Nature/Environment	currently
	Man	Currently
Drought	Economics/Financial	Currently
	Nature/Environment	Medium - High
	Man	Currently
Strong winds	Economics/Financial	Currently
	Physical/ Infrastructure	Currently

Based on the table above, it can be described that in the type of flood disaster threat, the assets at risk are still at a moderate risk level, as well as the threat of Drought and Strong Wind disasters which are at a moderate risk level. In contrast to the threat of tidal/high waves on human assets, the disaster risk level is at a moderate-high level, while for economic and infrastructure risk assets it is at a moderate level.

Determining the Scale of Possibility

Determination of the probability scale score is based on the indicators that have been explained, and after analysis, information was obtained on the possibility of a disaster occurring with a score of 3 and summarized as shown in Table 4. From the table, it can be seen that tidal floods, high tides, droughts, and strong winds are types of hazards that have a significant level of threat in Gili Gede. These threats have a

high probability of occurrence, which is above 50%. This means that these disasters are almost certain to occur repeatedly and become risks that must be anticipated by the community and related parties, this also means that these disasters are not just potential threats, but are very real and recurring threats in this area. The geographical conditions and climate characteristics in Gili Gede make this area vulnerable to these natural disasters, which have a major impact on people's lives, infrastructure, the surrounding environment, and socio-cultural.

Table 4. Hazard/Threat Probability Scale Table

Types of Hazards	Possibility
Tidal Flood	3
High Tide/High Wave	3
Drought	3
Strong winds	3

Source: Researcher Analysis Results (2024)

Consequence Scale Measurement

The following are the results of the consequence scale measurements in Table 5.

Table 5. Consequence Scale measurement table

Types of Hazards	**Consequence**
Tidal Flood	3
High Tide/High Wave	3
Drought	2
Strong winds	2

Source: Researcher Analysis (2024)

Based on the risk analysis table above, here is a description of the types of hazards in Gili Gede and their level of consequences for the environment, infrastructure, society, and socio-culture. Tidal flooding has a consequence level of 3, which indicates that its impact is quite significant throughout the region. When it occurs, tidal flooding can cause environmental damage and disrupt economic activities, especially in areas close to the coastline.

High tides or waves also have consequences at level 3, with impacts similar to tidal flooding. High waves can cause coastal erosion, damage to buildings near the coast, and risks to the safety of residents living or working in coastal areas. This condition can disrupt sea transportation routes and fishing activities, having a major impact on the daily lives of coastal communities.

Drought has consequences at level 2, indicating impacts that have a lower risk level compared to tidal floods or tidal waves. Drought can cause a shortage of clean water, and impact public health due to limited water supplies. The impact is quite serious especially during the long dry season, although not as severe as tidal floods or tidal waves.

Strong winds also have a consequence level of 2 with an impact that is influential but not as big as tidal flooding or high waves. The threat of strong winds can cause light to severe damage to buildings, and disrupt sea and land transportation activities. The impact is more limited but still needs to be anticipated to avoid economic losses and safety risks.

From the description above, the hazards with the most significant impacts in Gili Gede are tidal floods and tidal waves, both of which have the highest level of consequences. Drought and strong winds, although having an impact, have lower consequences, but still need to be watched out for and anticipated.

Threat Ranking in Gili Gede Indah

Threat ranking in Gili Gede Indah was conducted to identify the types of disasters that have the greatest potential and impact on the research area. This step is important because Gili Gede Indah is a coastal area that is vulnerable to various threats such as tidal floods, tidal waves, droughts, and strong winds. The following are the results of the threat ranking in Table 6. Based on the risk analysis table, the following is a description of the type of hazard, likelihood of occurrence, consequences, scores, and handling priorities for each type of disaster in Gili Gede.

Table 6. Threat Ranking in Gili Gede Indah

Types of Hazards	Possibility	Consequence	Score	Priority
Tidal Flood	3	3	6	II
High Tide/High Wave	3	3	6	I
Drought	3	2	5	III
Strong winds	3	2	5	IV

Source: Researcher Analysis (2024)

Tidal flooding has a probability of occurrence level 3, indicating that this threat has the potential to occur significantly in Gili Gede. The consequences are also at level 3, indicating a serious impact on the community, infrastructure, and surrounding environment. With a total score of 6, tidal flooding is placed at priority II, meaning it is important to get attention and mitigation efforts, although not the most important.

High tides or high waves have the same probability of occurrence as tidal floods, namely at level 3, indicating a high potential for occurrence. The consequences of high tides are also at level 3 with significant impacts similar to tidal floods. With a total score of 6, this threat is given priority I, placing it as the type of hazard that needs the most attention and immediate mitigation to protect communities and coastal areas.

Drought also has a probability of occurrence at level 3, but its consequences are at level 2 indicating a more limited impact compared to tidal flooding or tidal waves. The total score for drought is 5 which places it at priority III. Although its impact is not as severe as tidal flooding or tidal waves, drought remains a threat that requires attention, especially for the sustainability of water resources.

The high wind threat has a probability of occurrence at level 3, indicating that high winds are almost certain to occur in this area. The consequences are at level 2 with impacts that can affect infrastructure and community activities but are not as severe as other threats. The total score for this threat is 5 so it is placed at priority IV. Although it is the last priority, high winds still require preparedness strategies to reduce their impact on the community.

Thus, it can be concluded that the main priority for the authorities to pay attention to is the threat of tidal waves or high waves which have the most significant and frequent impacts, followed by tidal flooding.

Priority Threat/Hazard Matrix

The hazard matrix is useful for providing a systematic framework for assessing and prioritizing various threats based on their level of risk and impact. This matrix allows for more targeted decision-making in disaster planning and mitigation. The prepared threat matrix is shown in Table 7.

Table 7. Priority Threat/Hazard Matrix

HAZARD MATRIX			CONSEQUENCE		
			Extraordinary	Intermediate	Not real
			[3]	[2]	[1]
POSSIBILITY	Almost Certain	[3]	• Tidal flood • High tide/wave (Very dangerous)	Drought Strong Wind (Danger)	-
	Possible	[2]	-	-	-
	Seldom	[1]	-	-	-

Source: Researcher Analysis (2024)

Based on the assessment above, each threat can be categorized according to the matrix table. The total value of the type of threat of tidal floods and high tides is at a value of 6 with a very dangerous category, while the threat of drought and strong winds is at a value of 5 with a category of Danger. The threat of high tide disasters is a threat with a priority that must receive attention from the community and policymakers in reducing disaster risks.

CONCLUSION

Based on the research results and discussion above, it can be concluded that:

1. In the Gili Gede Indah area, various potential disaster threats can threaten the safety and welfare of the community and the environment. Based on the results of research that has been conducted by researchers, the various disasters/threats that occur are hydrometeorological threats consisting of various forms of disasters/threats, namely high waves, tidal floods, droughts, and strong winds. Each of these threats has different characteristics and levels of danger, but all have the potential to cause significant impacts. High waves in this area are in the very dangerous category, which indicates that the intensity and frequency of these high wave events have a high potential risk to people's lives, infrastructure, and resources around the coastal area. In addition, the threat of tidal floods, which occur due to rising sea levels that exceed normal limits, is also one of the threats that is categorized as dangerous. Tidal floods can damage plants and trees that function to withstand/reduce abrasion, as well as disrupt the economic activities of residents. Likewise, prolonged droughts and strong winds that often hit this area are also in the danger category. Drought can have a significant impact on the availability of clean water and increase the vulnerability of communities to economic and social instability. On the other hand, strong winds can damage infrastructure, collapse buildings, and increase the risk to life safety. All forms of hydrometeorological threats, both those categorized as very dangerous and dangerous, require special attention from various parties to reduce their impacts, through planned and systematic mitigation efforts, so that the welfare and security of the Gili Gede Indah community can be well maintained.
2. The vulnerability level of the Gili Gede community to hydrometeorological threats consisting of various forms of disasters/threats, namely high waves, tidal floods, droughts, and strong winds is at a level categorized as a medium-high level of vulnerability. This condition shows that the local community has limitations in dealing with the impacts caused by these types of disasters, but is not completely vulnerable significantly. The threat of high waves that cause coastal abrasion that occurs in coastal areas and threatens the sustainability of coastal ecosystems, while tidal floods that are often caused by high sea levels can damage infrastructure, plants, and trees that function as retainers of the integrity of the coast and other marine ecosystems. On the other hand, prolonged drought can result in difficulty in accessing clean water and harm public health, while strong winds have the potential to damage buildings and increase the risk of injury.

RECOMMENDATION

Some recommendations that can be submitted based on the research results are:

1. This moderate level of vulnerability is influenced by several factors, such as limitations in community readiness and adaptability, as well as the availability of resources and infrastructure that are less than optimal in supporting disaster resilience. However, the Gili Gede community still has some ability to reduce the impact of disaster risk through adaptation and mitigation measures that have been taken. However, to achieve a better level of resilience, it is necessary to strengthen community capacity and improve supporting infrastructure, as well as synergy efforts between the community, government, and related stakeholders in dealing with natural disasters that may occur in the future.
2. Efforts to reduce the impact of disasters require a comprehensive study of Disaster Risk Reduction (DRR). This risk study is a concrete basis for every activity or action directed at disaster management, especially those focused on risk reduction. Through DRR, risk factors can be identified and analyzed systematically so that mitigation efforts can be formulated more precisely and effectively. This study is very important because aspects of disaster risk reduction will be included in the Village Annual Work Plan and the planning of the West Lombok Regency Government. Thus, DRR not only provides guidelines for operational steps but also ensures the integration of risk reduction into long-term development policies.
3. The village funds that are now allocated with a fairly large value are an opportunity for village governments to carry out DRR studies independently. Through the use of these funds, villages can carry out disaster risk studies in more detail and relevant to local conditions. This step not only increases the effectiveness of risk reduction but also strengthens the village's capacity to respond to disasters so that disaster management efforts become better, more sustainable, and oriented towards the needs of the local community. The implementation of DRR at the village level is expected to strengthen community resilience to the threat of disasters and create a safer and more resilient environment in the future.

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