

Community Vulnerability Assessment for Vulnerable Populations in the CLEAR Program



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1. Executive Summary

1.1. Research Overview

INANTA and CWS Indonesia are developing an Early Action project as part of Climate Change Adaptation (CCA). This program is known as Community-Led Early Action and Resilience (CLEAR). The program is planned for three years and targeting four urban villages in Makassar. The CLEAR program has three main outcomes: (1) Increased knowledge, understanding, motivation, and capacity of community members to assess climate and disaster vulnerability and act independently; (2) Disaster impacts can be proactively mitigated through the successful implementation of anticipatory action and strengthening of early warning systems (EWS); (3) Improved access for communities to alternative livelihoods to reduce the impact of disasters and other displacement triggers.

This study report aims to identify and address the vulnerabilities faced by different groups of people, with a particular focus on children, the elderly, people with disabilities, and marginalized communities, including female heads of households without a fixed income. In addition, researchers also conducted a Vulnerable Group Assessment to inform future livelihood support programs, as an integral part of this activity.

The findings of this study reveal significant vulnerabilities among the target groups. Children are highly vulnerable to health problems, disruptions to education, and psychological stress, exacerbated by economic instability and the impacts of climate change. The elderly face increased health risks, social isolation, and limited access to essential services, often compounded by mobility and financial constraints. People with disabilities encounter significant barriers to accessing healthcare, employment, and social services, coupled with additional challenges posed by environmental changes. Marginalized communities, including female heads of households without a fixed income, often experience systemic inequities, including poverty, limited access to education and healthcare, and increased exposure to environmental hazards. These vulnerabilities are further aggravated by inadequate social support systems and policies that fail to address the unique needs of these groups.

1.2. Main Findings

This vulnerability study highlights the significant challenges faced by communities in the four target sub-districts. It reveals a disturbing link between environmental threats and inadequate infrastructure, disproportionately impacting people with disabilities and marginalized communities. One critical issue identified is the state of drainage and sanitation. Clogged drains and the conversion of water catchment areas into housing led to flooding. This creates breeding grounds for mosquitoes, causing an increased risk of waterborne diseases like dengue fever and diarrhea. Additionally, poorly managed waste disposal exacerbates drainage problems and attracts disease-carrying pests. These environmental challenges are compounded by the pollution of clean water sources, further restricting access to safe drinking water.

The impacts of these environmental challenges are severe for people with disabilities and marginalized communities. Clogged drains and flooding can significantly limit the mobility of individuals with disabilities. Moreover, poor sanitation also increases the health risks for those with weakened immune systems. The assessment also highlights shortcomings in infrastructure and resource allocation. Existing aid programs appear to lack coordination, leading to disparities in service delivery. Additionally, the amount of aid available may not be sufficient to meet the needs of the community.

In terms of human resources, the study reveals a lack of disaster preparedness knowledge among many community groups. Many lack the training and understanding required to prepare for and respond to disasters effectively. This is further exacerbated by the lack of dedicated disaster management organizations at the community level. Despite these challenges, the study recognizes the positive steps taken by INANTA in collaboration with local governments to establish Disaster Preparedness Groups/*Kelompok Siaga Bencana* (KSB). This initiative demonstrates a commitment to building local capacity in disaster response. However, the newly formed KSB groups require training and capacity building. They need to develop skills in conducting risk assessments, creating disaster management plans, and providing essential frontline support during emergencies. The vulnerability assessment also underscores the urgent need for a multi-pronged approach. This approach must address environmental vulnerabilities, improve access to sanitation and clean water, provide targeted support to marginalized groups, and strengthen the capacity of community organizations in disaster preparedness and response. Through a comprehensive plan that addresses these critical areas, community well-being can be significantly enhanced.

The Vulnerability Group Assessment (VGA) has identified significant economic vulnerabilities caused by climate change, impacting livelihoods, food security, and access to resources. It is crucial to establish clear criteria for selecting participants in livelihood support programs, prioritizing those most affected by economic and environmental vulnerabilities. Tailoring livelihood support programs to address the specific needs identified through this assessment is paramount. These programs must be adaptive and resilient to future climate impacts, ensuring they provide sustainable benefits to beneficiaries.

1.3. Recommendations

Anticipating and adapting to climate change necessitates the development of community-specific climate adaptation strategies that prioritize the protection of vulnerable groups. These strategies should involve sustainable livelihood enhancement and resilience-building activities that mitigate the economic impacts of climate change. Enhancing infrastructure and social safety nets will help reduce the vulnerability of communities at risk from climate-related disasters. For instance, investing in climate-resilient housing and developing preparedness and emergency response plans tailored to the needs of vulnerable groups can significantly enhance their capacity to withstand climate shocks.

In conclusion, this assessment highlights the critical vulnerabilities faced by children, the elderly, people with disabilities, and marginalized communities, particularly in the context of climate change. By anticipating and adapting to climate change, and through well-designed livelihood support programs, we can better protect and empower vulnerable groups, ensuring their inclusion and resilience in the face of future challenges.

2. Introduction

Societies are not equal. Socioeconomic inequalities create vulnerabilities for certain groups, limiting their access to resources, services, and opportunities. This lack of access creates a cycle of poverty, discrimination, and exploitation, further hindering their ability to overcome challenges. These vulnerable groups, which include low-income families, ethnic minorities, people with disabilities, and the elderly, face significant barriers in obtaining basic necessities such as healthcare, education, and social safety nets.

Climate change acts as a threat multiplier, worsening existing vulnerabilities. Events such as droughts, floods, and sea-level rise disproportionately impact marginalized groups. Their livelihoods,

food and water security, and health are significantly affected, leading to further displacement and hardship. For instance, droughts can devastate the crops of communities already struggling with poverty, making them even more vulnerable to food insecurity.

Community programs are designed to empower vulnerable groups by addressing these challenges and improving their quality of life. These programs can offer a range of support, such as skills training, access to healthcare, or financial assistance. However, the effectiveness of these programs hinges on a deep understanding of the specific vulnerabilities faced by different groups within the target population. A universal approach will not succeed. Programs need to be tailored to meet the unique needs of each group.

The CLEAR Project, initiated by CWS-INANTA, aims to build community resilience through community-led disaster preparedness, early action, and adaptive measures to climate risks and disasters. The project will facilitate capacity-building activities based on community needs and promote the implementation of anticipatory actions to reduce the impact of disasters. Key activities include climate vulnerability assessments, knowledge-sharing sessions, sponsorship of community-proposed climate mitigation and adaptation actions, formation of disaster risk reduction (DRR) structures, development of community-based hazard risk information and early warning systems, and facilitation of participatory planning for adaptation options. The three phases of the project encompass awareness and knowledge raising, development of anticipatory action plans, and initiation of small-scale climate change adaptation initiatives. The project duration is three years, with a focus on community empowerment, technical support, and implementation of anticipatory and livelihood adaptation actions.

2.1. Objectives

The aim of this study is to:

- Identify and assess the vulnerabilities faced by vulnerable groups in society, including but not limited to children, the elderly, people with disabilities, and marginalized communities.
- Develop climate change anticipation and adaptation efforts to protect vulnerable groups from its negative impacts.

2.2. Scope of Study

The study focuses on the following aspects:

- Community profile and demographics in the project target areas.
- Existing services and project activities for vulnerable communities.
- Community perceptions of vulnerability, risks, and impacts of disasters and climate change.
- Availability of resources, capacity, and institutional frameworks to support vulnerable communities in disaster risk reduction and climate adaptation.
- Livelihood patterns and economic activities of the community.
- Community networks, organizations, and existing social structures relevant to disaster resilience.
- Assessing existing vulnerabilities in the community, such as economic vulnerabilities due to the impacts of climate change, including the potential for support for sustainable livelihood activities, particularly for vulnerable groups. This will be further assessed for activity design and target recipient selection criteria development.

2.3. Methodology

This study employs a range of qualitative research methods to gather comprehensive and diverse data. A core component of this approach is the use of participatory mapping and assessment tools, which actively involve community members in identifying vulnerable areas and populations. These populations include but are not limited to children, the elderly, people with disabilities, and marginalized communities. By directly engaging these groups, the assessment ensures that their unique perspectives and needs are incorporated into the findings, fostering a more inclusive and accurate understanding of vulnerabilities.

In addition to identifying at-risk populations, this study also underscores the importance of monitoring and evaluation at both the community and government levels. This dual focus aims to facilitate the development of more effective and responsive programs. By establishing a robust monitoring and evaluation framework, the assessment seeks to ensure that interventions are not only successfully implemented but can also be adapted to changing circumstances and ongoing community input. This methodology provides a holistic view of community vulnerabilities and capacities, ensuring that the assessment is conducted in a comprehensive and participatory manner.

1. **Literature review**, a comprehensive review of existing reports, documents, and datasets related to disaster risk reduction, climate adaptation, vulnerability, and development in Makassar will be conducted.
2. **Focus Group Discussions (FGDs)** will be conducted with selected community members and other stakeholders to assess their experiences, knowledge, attitudes, practices, and needs related to disaster preparedness and climate adaptation.
3. **Key Informant Interviews (KIIs)** will be conducted with relevant stakeholders, including community leaders, local government representatives, and civil society organizations, to understand their perspectives on climate change risks and existing initiatives.
4. **Field observations** will be conducted to assess the physical environment and infrastructure within the project area.
5. **Triangulation and Validation:** Data from the various methods and sources will be compared and contrasted to ensure the validity and credibility of the research findings. Researchers will engage community members and other stakeholders in the research process to validate the findings and ensure that they are relevant and meaningful to those affected.

Table 1 Methods and Respondents/Key Informants

Methods	Respondents/Informants	# Actual Respondents
Focus Group Discussion (FGD)	Urban Village / Community representatives	<p>Four Focused Group Discussions (FGDs) were conducted, divided by sub-district (two urban villages per sub-district).</p> <p>Biringkanaya Sub-district; Katimbang Urban Village 15 participants (14 female, 1 male), including 2 individuals with disabilities. Paccerakkang Urban Village 12 participants (6 female, 6 male), including 1 individual with disabilities. Total: 27</p> <p>Manggala Sub-district Tamanggapa Urban Village: 15 participants (10 female, 5 male), with 2 elderly participants. Manggala Urban Village: 11 participants (7 female, 4 male), with 2 elderly participants. Total: 26</p> <p>Grand Total: 53 participants (37 female, 16 male), including 3 individuals with disabilities and 6 elderly participants.</p>
Key Informant Interview (KII)	<ol style="list-style-type: none"> 1. Regional Disaster Management Agency (BPBD) 2. Cooperatives, Small and Medium Enterprises Office 3. Social Services Department 	<ol style="list-style-type: none"> 1. BPBD: 2 2. Cooperatives, Small and Medium Enterprises Office: 1 3. Indonesian Association of Persons with Disabilities (PPDI): 1
Total Respondent		57 people

The vulnerability assessment stages involve a systematic approach to gather relevant information followed by analysis with the aim of building a baseline understanding of the situation.

- **First stage**, involves a document review, which entails examining existing documents and literature related to the research topic. This helps in gaining background knowledge and identifying gaps in existing information.
- **Second stage**, focuses on preparing the necessary equipment and logistics for the research, ensuring that fieldwork can be carried out effectively. This includes designing and organizing FGDs and interviews/discussions and arranging field visits.
- **Third stage**, involves the collection of primary data through KIIs, FGDs, and observations. KIIs involve conducting structured interviews with individuals who have specialized knowledge or experience relevant to the research. FGDs provide a platform for group discussions and obtaining qualitative insights from participants.

- Once the data has been collected, the **fourth stage** focuses on analyzing the findings. This involves organizing, interpreting, and synthesizing the data to identify patterns, trends, and key insights. Various analytical techniques and tools can be used depending on the nature of the data.
- The **final stage** involves writing the study report. This report summarizes the objectives, methodology, findings, and key conclusions of the baseline study. This document serves as a comprehensive document that provides a basis for action, interventions, or further research in the future.

Overall, the baseline study phases ensure a systematic and rigorous approach to data collection and analysis, leading to a comprehensive understanding of the study topic and providing a strong foundation for decision-making and planning.

2.4. Research Limitations

Throughout the vulnerability assessment study, several challenges were encountered that impacted data collection, including:

- Information and data from the Cooperatives and SME Office of Makassar were unavailable during the visit to their office. This limited the availability of data and information, particularly regarding the city government's support for economic empowerment efforts, specifically for vulnerable groups.
- The extremely hot and humid weather conditions affected participant attendance in the Focus Group Discussions (FGDs) and hindered the research team's ability to collect data effectively.
- In Manggala sub-district, there were no representatives from disability groups to participate in the FGDs, leaving one segment of the vulnerable population unrepresented.
- The potential for bias in the collected data existed due to the possibility of participants not being fully truthful or not recalling all details accurately.

Overall, the researchers acknowledged the challenges faced during data collection and emphasized the importance of taking these limitations into account when interpreting the findings. Despite these challenges, the study was able to gather valuable information on vulnerability in Makassar.

3. Target Community Profile

3.1. Demographic Information

3.1.1. Demographic Data of Biringkanaya Sub-district, Makassar

The following is some important demographic data of Biringkanaya Sub-district, Makassar¹.

Table 2 Demographic Information of Biringkanaya

No.	Description	Data
1	Population	Total Population: 215,820 (2023) Male: 108,357 (2023) Female: 107,463 (2023).
2	Population Density	1,549 inhabitants/km ² (2023) Population Growth: 2021-2022: 0.55% 2022-2023: 2.13%
3	Population Composition by Age	0-14 years old: 35.24% 15-64 years old: 59.53% 65 years old and over: 5.23%
4	Population Composition by Occupation	Office Workers: 31.20% Entrepreneurs: 20.85% Farmers: 10.43% Laborers: 10.21% Service Workers: 9.87% Pensioners: 3.44%
5	Religion	Islam: 98.42% Christianity: 1.25% Hinduism: 0.18% Buddhism: 0.07% Confucianism: 0.05%
6	Ethnicity	Makassarese: 67.85% Buginese: 15.21% Mandarese: 5.43% Torajan: 3.21% Javanese Tribe: 2.87% Other Tribes: 5.43%
7	Education	Elementary School/Madrasah Ibtidaiyah (MI): 37.21% Junior High School/Madrasah Tsanawiyah (MTs): 22.45% Senior High School/Madrasah Aliyah (MA): 18.54% Diploma/Bachelor's Degree (S1): 11.23% Master's Degree (S2): 0.37% Doctoral Degree (S3): 0.20%
8	Infant Mortality Rate	7.2 per 1,000 live births
9	Life Expectancy	68,5 years
10	Economy	Gross Regional Domestic Product (GRDP) per Capita: Rp. 12,500,000,- per year (2023)
11	Unemployment Rate	6,34% (2023)

¹ Badan Pusat Statistik (BPS) Kota Makassar, Dinas Kependudukan dan Catatan Sipil Kota Makassar, <https://makassarkota.bps.go.id/publication/2022/09/26/9cb53463ba3bd6c8adae1585/kecamatan-makassar-dalam-angka-2022.html>

Based on the demographic data provided, several key findings can be drawn about Biringkanaya Sub-district in Makassar. Biringkanaya is a populous sub-district with a growing population. The majority of the residents are Makassar people and adhere to the Islamic faith. The education and health indicators in the sub-sub-district remain relatively low. This suggests a need for improvement in these areas. The economy of Biringkanaya is primarily driven by the informal sector. This is reflected in the high unemployment rate. The Makassar City government should prioritize Biringkanaya Sub-district in its efforts to enhance the well-being of its residents. This could involve initiatives to improve access to education, healthcare, and employment opportunities.

The demographic data of Biringkanaya Sub-district serves as a valuable foundation for the government to formulate effective policies aimed at improving the lives of its residents.

Flooding is a recurring issue in Biringkanaya Sub-district, particularly during the rainy season. The primary causes of flooding include overflowing rivers. Several rivers the northern, eastern, and southern parts of the sub-district overflow during heavy rainfall. Also, the existing drainage systems are inadequate to handle the volume of rainwater, leading to waterlogging and flooding on streets. The lack of adequate water retention areas and permeable surfaces contributes to the rapid accumulation of rainwater, exacerbating flooding.

Katimbang Urban Village

Katimbang Urban Village is situated within Biringkanaya Sub-district, Makassar, South Sulawesi, Indonesia. It was established in 2015 as part of the expansion of Makassar's administrative areas, split from Paccerakkang Urban Village². Katimbang Urban Village encompasses an area of 1.89 km², divided into 31 RTs (neighborhood units) and 7 RWs (community units). Astronomically, the urban village lies at coordinates 5°08'22.40" S and 119°31'25.50" E. According to the 2021 census, Katimbang Urban Village has a population of 4,064, comprising 2,002 males and 2,062 females. The population density is 5,425 inhabitants per square kilometer. The population structure is as follows: 0-14 years: 28.08%, 15-64 years: 64.20%, and 65 years and above: 7.72%. In terms of education levels, 14.44% of the population have not attended school or are still in school, 34.07% have completed elementary school, 23.30% have completed junior high school, 19.20% have completed senior high school, 6.82% hold a diploma or bachelor's degree, 1.18% hold a master's degree, and 0.03% hold a doctoral degree³.

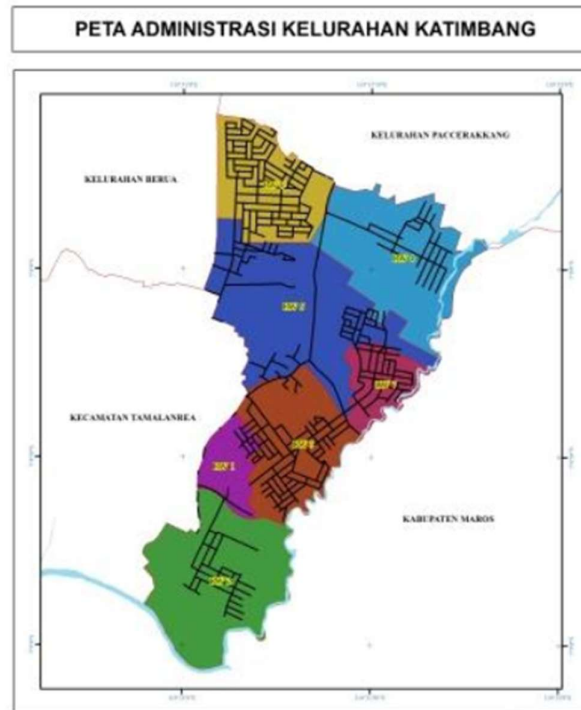
The primary occupations in Katimbang Urban Village are: private sector workers (38.91%), entrepreneurs (28.18%), farmers/gardeners (11.89%), civil servants (9.21%), construction workers (4.84%), and others (6.97%). The predominant religion in Katimbang Urban Village is Islam, with 99.90% of the population adhering to it. The remaining 0.10% of the population comprises Protestant Christians, Hindus, and Buddhists. In terms of ethnicity, 84.93% of the population belong to the Bugis ethnic group, followed by Makassar (10.44%), Mandar (1.84%), Toraja (1.22%), Javanese (0.84%), and others (0.73%).

Katimbang Urban Village is divided into 4 RWs and 20 RTs. It boasts several tourist attractions, including Katimbang Beach and Katimbang Park. Additionally, the urban village has schools, puskesmas (community health centers), and mosques to cater to the needs of its residents.

² <https://www.liputan6.com/regional/read/2290325/makassar-dimekarkan-jadi-153-urban-village-dan-15-kecamatan>

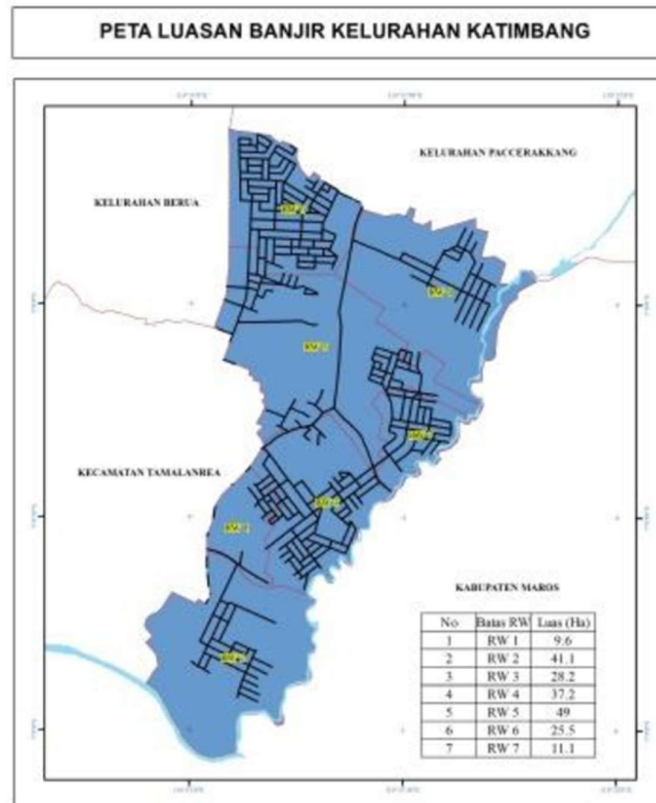
³ <https://dasawisma.pkk.makassarkota.go.id/>, <https://kampungkb.bkkbn.go.id/>

Figure 1 Administration Map of Katimbang Urban Village



Katimbang Urban Village, situated within Biringkanaya Sub-district, Makassar, has a recurring history of severe flooding, particularly during the rainy season. This persistent issue extends beyond the recent flooding in early 2019. According to the Disaster Mitigation Agency of Makassar, the urban village consistently experiences flooding, regardless of rainfall intensity, with water levels reaching approximately 1.5 meters (BPBD Makassar, 2019).

Figure 2 Flood Hazard Map of Katimbang Urban Village



The flood hazard levels in Katimbang Urban Village, Biringkanaya Sub-district, Makassar, are categorized into two classes: moderate and high. Moderate flood hazard areas are located in RWs 1, 2, 3, and 4, while high flood hazard areas are found in RWs 5, 6, and 7⁴.

An analysis of flood management strategies in Katimbang Urban Village, based on community perceptions of pre-disaster, during-disaster, and post-disaster phases, reveals the following: **Pre-disaster phase:** relevant agencies have not conducted adequate public awareness campaigns and training programs related to flood prevention and mitigation, resulting in a lack of active involvement from both the community and the government; **During-disaster phase:** there is a lack of essential medical supplies, particularly those related to skin diseases, and clean drinking water during flood events. This is particularly evident in RWs 1 and 2, indicating an uneven distribution of aid to affected areas; **Post-disaster phase:** there is a lack of proper refugee management and land rehabilitation measures, including the restoration of environmental conditions and infrastructure.

The Makassar City Government should dedicate greater attention and resources to mitigating flooding in Katimbang Urban Village. They should implement comprehensive and equitable solutions that promote sustainable urban planning and development.

For the community, it is important to be more aware of the importance of environmental protection and how their actions can impact flood risks. Additionally, they should comply with government regulations and guidelines related to waste management, land use, and construction practices to minimize flood risks.

⁴ Algafari, Fadhil Surur. 2021. Strategi Penanganan Banjir Di Katimbang Urban Village Kecamatan Biringkanaya Kota Makassar

Paccerakkang Urban Village⁵

Paccerakkang Urban Village is situated within Biringkanaya Sub-district, Makassar, South Sulawesi, Indonesia. It encompasses an area of 2.51 km², divided into 46 RTs (neighborhood units) and 7 RWs (community units). Astronomically, the urban village lies at coordinates 5°07'31.62" S and 119°31'33.06" E. According to the 2019 census, Paccerakkang Urban Village has a population of 15,341, comprising 7,366 males and 7,975 females. The population density is 6,112 inhabitants per square kilometer.

In terms of education levels, the distribution is as follows: No/not yet in school: 12.23%; Elementary school (SD/MI): 30.36%; Junior high school (SMP/MTs): 22.19%; Senior high school (SMA/MA): 20.25%; Diploma/Bachelor's degree: 8.31%; Master's degree (S2): 1.33%; Doctoral degree (S3): 0.34%.

The primary occupations in Paccerakkang Urban Village are: Private sector workers: 38.79%; Entrepreneurs: 25.18%; Farmers/gardeners: 14.36%; Civil servants (PNS): 9.21%; Construction workers: 4.84%; Others: 7.62%. The predominant religion in Paccerakkang Urban Village is Islam, with 99.90% of the population adhering to it. The remaining 0.10% of the population comprises Protestant Christians, Hindus, and Buddhists. In terms of ethnicity, 84.93% of the population belong to the Bugis ethnic group, followed by Makassar (10.44%), Mandar (1.84%), Toraja (1.22%), Javanese (0.84%), and others (0.73%).

Paccerakkang Urban Village boasts several tourist attractions, including Paccerakkang Beach, Paccerakkang Park, and the Tombs of the Tallo Kings. Additionally, the urban village has schools, puskesmas (community health centers), and mosques to cater to the needs of its residents.

Based on information gathered by the Disaster Mitigation Agency of Makassar (BPBD Makassar), Paccerakkang Urban Village is identified as one of the three most flood-prone areas within Makassar. This urban village experiences recurrent flood events during the monsoon season. Several contributing factors have been linked to the frequent inundation in Paccerakkang Urban Village. These include inefficient drainage infrastructure, limited green space availability, uncontrolled waste management practices, and unsustainable community behavior. The act of littering and disposing of solid waste into drainage channels obstructs water flow and fosters flooding.

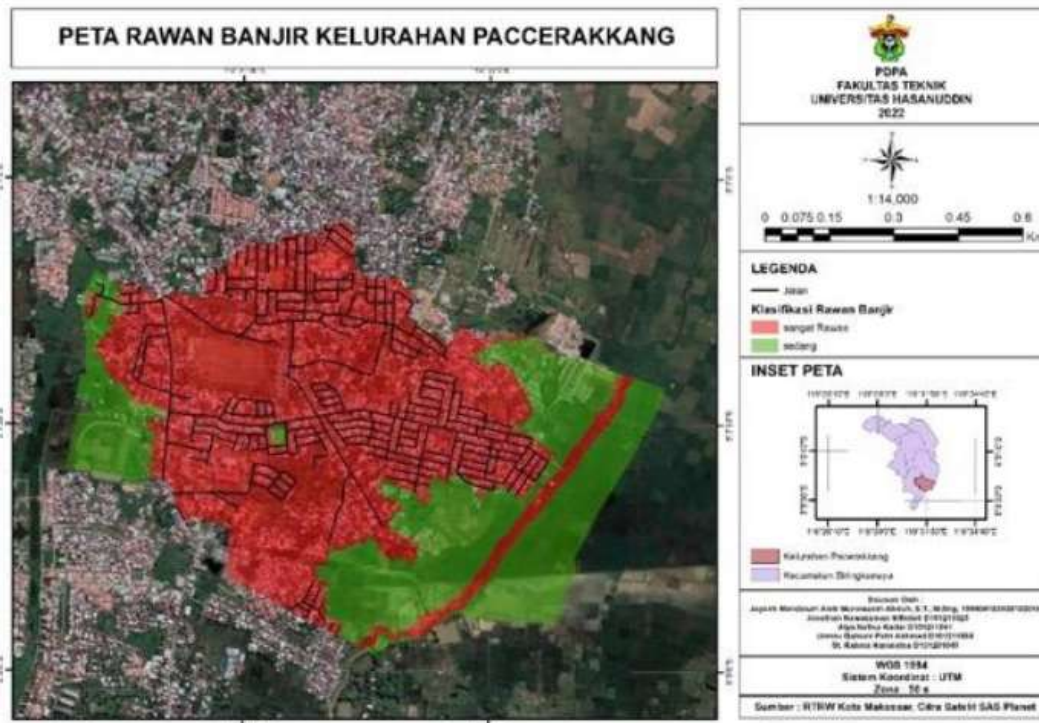
The identification of the underlying causes of flooding in Paccerakkang Urban Village paves the way for the development of effective solutions aimed at enhancing the flood resilience of this densely populated area. By adopting a participatory approach that actively involves the community in decision-making processes, a transformative approach to flood mitigation and preparedness can be implemented⁶.

Based on input from local residents, identifying suitable strategies for adaptive flood management is crucial for planning the environmental management of flood-prone residential areas in accordance with existing conditions. These strategies include: elevating river embankments, creating Green Open Spaces (RTH), widening or dredging drainage networks, repairing or constructing new drainage systems, and establishing flood warning posts.

⁵ <https://dasawisma.pkk.makassarkota.go.id/>, https://ban.wikipedia.org/wiki/Paccerakkang,_Biringkanaya,_Makassar, <https://kampungkb.bkkbn.go.id/>

⁶ Jurnal Pelita Kota. 2023. Penataan Lingkungan Permukiman Rawan Banjir Dengan Pendekatan Partisipatif Di Kawasan Sub Urban Kota Makassar

Figurer 3 Flood Hazard Map of Paccerrakkang Urban Village



3.1.2. Demographic Data of Manggala Sub-district, Makassar (2023)

Manggala Sub-district is a urban village in Makassar with a fairly large population, consisting 71,351 people.

Here is some important demographic data⁷:

Table 3 Demographic Information of Manggala Sub-district

No.	Description	Data
1	Population	Total: 71,351 Male: 34,329 Female: 37,022
2	Population Density	1,457 inhabitants /km ²
3	Population Composition by Age	0-14 years old: 32.40% 15-64 years old: 61.51% 65 years old and over: 6.09%
4	Population Composition by Occupation	Office Workers: 28.13% Entrepreneurs: 20.29% Farmers: 7.46% Laborers: 8.80% Service Workers: 9.21% Retirees: 3.11%
5	Religion	Islam: 98.42% Christianity: 1.25%

⁷ Badan Pusat Statistik (BPS) Kota Makassar, Dinas Kependudukan dan Catatan Sipil Kota Makassar
<https://makassarkota.bps.go.id/publication/2023/09/26/bd4d2255988cb8c1be80686/kecamatan-manggala-dalam-angka-2021.html>

		Hinduism: 0.18% Buddhism: 0.07% Confucianism: 0.05%
6	Ethnicity	Makassarese: 67.85% Buginese: 15.21% Mandarese: 5.43% Torajan: 3.21% Javanese: 2.87% Other: 5.43%
7	Education	Elementary School (SD/MI): 37.21% Junior High School (SMP/MTs): 22.45% Senior High School (SMA/MA): 18.54% Diploma/Bachelor's Degree (Diploma/S1): 11.23% Master's Degree (S2): 0.37% Doctoral Degree (S3): 0.20%
8	Infant Mortality Rate	77.2 per 1,000 live births
9	Life Expectancy	68.5 years
10	Economy	Rp. 11.800.000,- annually (2023)
11	Unemployment Rate	7.21% (2023)

Based on the analysis of the data presented, Manggala Sub-district exhibits several notable demographic characteristics. Significant population: With a population of 71,351, Manggala Sub-district ranks among the most densely populated areas in Makassar. The sub-district boasts a substantial young population, with 32.40% of residents falling within the 0-14 age bracket. This demographic trend indicates a promising potential for future human resource development.

A majority of the sub-district's population is employed in the informal sector, primarily as entrepreneurs and laborers. This informal employment pattern is accompanied by a relatively high unemployment rate. Education and health indicators suggest areas for improvement. The relatively low life expectancy and high proportion of individuals with limited education highlight the need for targeted interventions.

To address the demographic challenges and unlock the potential within Manggala Sub-district, the Makassar City government should adopt a multi-pronged approach. Firstly, they can focus on improving access to education and healthcare. This could involve constructing new schools and clinics, alongside programs that incentivize residents to prioritize education and preventive healthcare. Secondly, the government can leverage the strong entrepreneurial spirit in Manggala by fostering the development of the creative economy. This can be achieved through training programs, mentorship initiatives, and providing access to capital for aspiring business owners. Additionally, attracting investments to the sub-district would stimulate the growth of small and medium-sized enterprises (SMEs), further expanding formal employment opportunities. Finally, investing in infrastructure development is crucial. By improving roads, clean water supply, and sanitation facilities, the government can create a more supportive environment for economic activity and enhance the overall quality of life for residents. This focus on education, healthcare, economic development, and infrastructure, coupled with fostering community participation in the planning process, will position Manggala Sub-district for a brighter future.

In conclusion, the demographic data of Manggala Sub-district paints a clear picture of the area's development potential and challenges. By comprehending this data, the government can formulate well-informed and effective policies to enhance the well-being of its residents and foster the sub-

district's progress. It is crucial to recognize that demographic data is dynamic and requires regular updates. Therefore, continuous monitoring and evaluation of implemented development programs are essential to ensure alignment with evolving trends and demographics.

Tamangngapa Urban Village

Tamangngapa is a urban village located within the Manggala Sub-district of Makassar, South Sulawesi Province, Indonesia. Spanning an area of 1.50 square kilometers, the urban village comprises 33 neighborhoods (RT) and 7 community units (RW). Astronomically, Tamangngapa lies at coordinates 5°11'04.50" S and 119°29'25.90" E. With a total population of 10,698, Tamangngapa maintains a slight male majority, with 5,459 male residents and 5,242 female residents. The number of households stands at 3,020. The urban village is further divided into 7 neighborhood units (RW) and 34 community units (RT). Tamangngapa exhibits a relatively high population density of 4,905 inhabitants per square kilometer. The population's age structure is distributed as follows: 0-14 years old: 29.45%, 15-64 years old: 62.92%, 65 years and over: 7.63%. Educational attainment levels in Tamangngapa are as follows: No/not yet in school: 13.87%, Elementary School (SD/MI): 33.21%, Junior High School (SMP/MTs): 22.48%, Senior High School (SMA/MA): 19.84%, Diploma/Bachelor's Degree (Diploma/S1): 7.61%, Master's Degree (S2): 1.82%, Doctoral Degree (S3): 0.17%.

The primary occupations of Tamangngapa residents include: Private sector workers: 40.23%, Entrepreneurs: 26.52%, Farmers/Planters: 12.48%, Civil servants (PNS): 9.21%, Construction workers: 4.84%, Others: 6.72%. Islam is the predominant religion in Tamangngapa, with 99.90% of the population adhering to the faith. The remaining 0.10% of the population follows Christianity (Protestant), Hinduism, and Buddhism. The ethnic makeup of Tamangngapa is predominantly Bugis (84.93%), followed by Makassar (10.44%), Mandar (1.84%), Toraja (1.22%), Javanese (0.84%), and others (0.73%).

Based on its geographical location, Tamangngapa Urban Village is susceptible to various natural disasters, particularly flooding. Situated in a low-lying area and bordering several rivers, the urban village faces an elevated risk of inundation during the rainy season. Additionally, Tamangngapa is prone to whirlwinds, a common meteorological phenomenon in Indonesia. In some areas of Manggala Sub-district, steep cliffs and hillsides pose a landslide hazard, especially during heavy downpours.

The Makassar City Government and the Disaster Management Agency of Makassar (BPBD Makassar) have implemented several measures to mitigate disaster risks in Tamangngapa Urban Village, including construction of flood mitigation infrastructure, including drainage systems, dams, and water pumps, to reduce the impact of flooding, providing education and training to residents on disaster preparedness and response techniques, establishing volunteer teams to assist in evacuation and disaster relief efforts, as well as conducting regular disaster simulations to enhance community preparedness.

Manggala Urban Village

Manggala Urban Village, the capital of Manggala Sub-district in Makassar, South Sulawesi Indonesia, covers an area of 2.96 square kilometers. With a population of 14,520 (2020 data), the urban village comprises 7,220 male and 7,300 female residents, resulting in a population density of 4,905 inhabitants per square kilometer. The age distribution of Manggala's population is as follows: 0-14 years old: 29.45%, 15-64 years old: 62.92%, 65 years and over: 7.63%. Regarding educational levels, the urban village presents the following statistics: No/not yet in school: 13.87%, Elementary School (SD/MI): 33.21%, Junior High School (SMP/MTs): 22.48%, Senior High School (SMA/MA): 19.84%, Diploma/Bachelor's Degree (Diploma/S1): 7.61%, Master's Degree (S2): 1.82%, Doctoral Degree (S3):

0.17%. The primary occupations of Manggala residents include: Private sector workers: 40.23%, Entrepreneurs: 26.52%, Farmers/Planters: 12.48%, Civil servants (PNS): 9.21%, Construction workers: 4.84%, Others: 6.72%. Islam is the predominant religion in Manggala, with 99.90% of the population adhering to the faith. The remaining 0.10% of the population follows Christianity (Protestant), Hinduism, and Buddhism.

Due to its geographical location, Manggala Urban Village is susceptible to various natural disasters, particularly flooding. Situated in a low-lying area and bordering several rivers, the urban village faces an elevated risk of inundation during the rainy season. Additionally, Manggala is prone to whirlwinds, a common meteorological phenomenon in Indonesia. In some areas of Manggala Urban Village, steep cliffs and hillsides pose a landslide hazard, especially during heavy downpours. The Makassar City Government and the Disaster Management Agency (BPBD) of Makassar have implemented several measures to mitigate disaster risks in Manggala Urban Village, including construction of flood mitigation infrastructure, including drainage systems, dams, and water pumps, to reduce the impact of flooding. Providing education and training to residents on disaster preparedness and response techniques. Establishing volunteer teams to assist in evacuation and disaster relief efforts, and conducting regular disaster simulations to enhance community preparedness.

3.2. Vulnerability Information

3.2.1. Vulnerability Data for Disasters in Manggala Sub-district, Makassar

Manggala Sub-district in Makassar is highly susceptible to various types of disasters, particularly flooding. Based on studies and research conducted by various parties, several vulnerability indicators in Manggala Sub-district can be identified as follows⁸:

Physical and Infrastructure Factors

- Manggala Sub-district has a flat topography with an average elevation of 2-22 meters above sea level (masl). This condition causes rainwater to easily accumulate and potentially cause flooding⁹.
- According to data from the Disaster Management Agency of Makassar (BPBD Makassar), flood levels in Manggala Sub-district can reach 1-2 meters.
- The soil type in Manggala Sub-district is dominated by clay soil, which has low water absorption capacity. This exacerbates waterlogging conditions and increases the risk of flooding.
- The drainage system in Manggala Sub-district is still inadequate, especially in densely populated areas and informal settlements.
- The condition of the road network in Manggala Sub-district is still inadequate, especially in densely populated residential areas. This can hinder the evacuation process and distribution of aid during disasters¹⁰.
- The road network in Manggala Sub-district is still prone to disruption, especially during floods. This can disrupt community activities and hinder the rescue process.
- Communication facilities in Manggala Sub-district are still limited, especially in remote areas. This can hinder coordination and communication during disasters.

⁸ Badan Pusat Statistik (BPS) Kota Makassar

⁹ Syamsuriati, dkk. (2020). Kajian Kerentanan Bencana Banjir di Kota Makassar Menggunakan Model Overlay. Jurnal Teknik Sipil, 9(1), 72-81. <https://iptek.its.ac.id/index.php/jats>

¹⁰ Rakyat Sulsel: <https://rakyat Sulsel.fajar.co.id/2024/01/20/pengungsi-banjir-di-kecamatan-manggala-dan-biringkanaya-mulai-kembali-ke-rumah/>

Human Factors

- **Community Awareness:** Public awareness of disaster risks in Manggala Sub-district still needs to be improved. This can be seen from the current situation where people still live in flood-prone and landslide-prone areas.
- **Disaster Response Capacity:** The community in Manggala Sub-district needs to be equipped with knowledge and skills related to disaster mitigation, evacuation, and rescue.
- **Waste Management:** Lack of public awareness in waste management can lead to clogged drains and exacerbate flooding.

Natural Resource Factors

Manggala Sub-district has several natural resource-related issues that can increase vulnerability to disasters, such as¹¹:

- **Land Availability:** A large portion of the land in Manggala Sub-district is used for settlements and economic activities. This causes a decrease in water absorption areas, increasing the risk of flooding.
- **Forest Condition:** Most of the forests in Manggala Sub-district have been cleared. This causes a decrease in groundwater absorption capacity and increases the risk of landslides.
- **Rivers:** Rivers in Manggala Sub-district have experienced silting and narrowing. This causes rivers to be unable to accommodate high rainwater discharge, increasing the risk of flooding.

Socioeconomic Factors

- Manggala Sub-district has a relatively high population density of 1,457 inhabitants/km². This increases the community's vulnerability to disasters, especially during evacuation and rescue processes.
- Data from the Makassar Central Bureau of Statistics (BPS) shows that the poverty rate in Manggala Sub-district is still classified as high, reaching 12.28% (2023). This condition makes the poor more vulnerable to the impacts of disasters.
- The level of understanding of the community in Manggala Sub-district is still relatively low. This can hinder the process of education and socialization related to disaster mitigation.
- The level of public understanding in Manggala Sub-district is still relatively low. This can hamper the process of education and socialization related to disaster mitigation.
- Community awareness of disaster risks in Manggala Sub-district still needs to be improved. This can be seen from the fact that there are still many people living on riverbanks and landslide-prone areas¹².

Analysis of the data above shows that Manggala Sub-district has a fairly high vulnerability to disasters, especially floods. This is caused by several factors, such as the physical condition of the area, socioeconomic problems, and inadequate infrastructure. The Makassar City Government needs to take strategic steps to increase disaster resilience in Manggala Sub-district. Some of the steps that can be taken include:¹³:

¹¹ <https://ejurnal.its.ac.id/index.php/teknik/article/view/7263>, <https://ejurnal.its.ac.id/index.php/teknik>, <https://repository.its.ac.id/>

¹² Penelitian terkait kerentanan bencana di Kecamatan Manggala

¹³ <https://ojs.unm.ac.id/JES/article/download/52056/23927>, <https://ejurnal.its.ac.id/index.php/teknik/article/view/7263>, https://repository.its.ac.id/64932/1/3610100057-Undergraduate_Thesis.pdf

- Drainage improvement by constructing new drainage systems, expanding and deepen existing drainage channels, and regularly clean drains to remove debris and sedimentation.
- Community awareness enhancement by conducting educational and socialization programs on disaster mitigation, and establishing disaster response communities at the urban village and neighborhood levels.
- Infrastructure strengthening by constructing disaster-resistant infrastructure, including residential buildings, and improving road networks and communication infrastructure.
- Poverty reduction policies by implementing social assistance and economic empowerment programs to enhance the well-being of the poor and vulnerable.

By implementing these proposed mitigation strategies, Manggala Sub-district can significantly enhance its disaster preparedness and resilience.

3.2.2. Disaster Vulnerability Data in Biringkanaya Sub-district, Makassar

Biringkanaya Sub-district, Makassar, is an area vulnerable to various types of disasters, especially floods and strong winds. Based on studies and research conducted by various parties, several vulnerability indicators in Biringkanaya Sub-district can be identified as follows¹⁴:

Natural Resource Factors

- **Land Availability:** A large portion of the land in Biringkanaya Sub-district is used for settlements and economic activities. This causes a decrease in water absorption areas, increasing the risk of flooding.
- **Forest Condition:** Most of the forests in Biringkanaya Sub-district have been cleared. This causes a decrease in groundwater absorption capacity and increases the risk of landslides.
- **Rivers:** Rivers in Biringkanaya Sub-district have experienced silting and narrowing. This causes rivers to be unable to accommodate high rainwater discharge, increasing the risk of flooding.
- **Strong Winds:** Biringkanaya Sub-district is located on the coast, making it vulnerable to strong winds and storms.

Human Factors

- **Community Awareness:** Public awareness of disaster risks in Biringkanaya Sub-district still needs to be improved. This can be seen from the fact that there are still many people living on riverbanks and landslide-prone areas.
- **Disaster Response Capacity:** The community in Biringkanaya Sub-district needs to be equipped with knowledge and skills related to disaster mitigation, evacuation, and rescue.
- **Waste Management:** Lack of public awareness in waste management can lead to clogged drains and exacerbate flooding.
- **Community Behavior:** Unenvironmentally friendly community behaviors, such as littering and illegal logging, can exacerbate disaster vulnerability.

Physical and Infrastructure Factors

- Biringkanaya Sub-district has a flat topography with an average elevation of 2-5 meters above sea level (masl). This condition causes rainwater to easily accumulate and potentially cause flooding¹⁵.

¹⁴ Badan Pusat Statistik (BPS) Kota Makassar,

¹⁵ Sari, dkk. (2019). Analisis Kerentanan Bencana Banjir di DAS Jeneberang Kota Makassar Menggunakan Model SWAT dan GIS. Jurnal Sains dan Teknologi, 20(3), 361-372. https://etda.libraries.psu.edu/files/final_submissions/19072

- Based on data from the Disaster Management Agency (BPBD) of Makassar, flood levels in Biringkanaya Sub-district can reach 0.5-1 meter¹⁶.
- The soil type in Biringkanaya Sub-district is dominated by clay soil, which has low water absorption capacity. This exacerbates waterlogging conditions and increases the risk of flooding.
- The drainage system in Biringkanaya Sub-district is still inadequate, especially in densely populated areas and informal settlements.
- Some areas in Biringkanaya Sub-district have a relatively high slope, making them prone to landslides, especially during the rainy season.
- The condition of the road network in Biringkanaya District is still inadequate, especially in densely populated residential areas. This can hinder the evacuation process and distribution of aid during disasters.
- The electricity network in Biringkanaya Sub-district is still prone to disruption, especially during floods or strong winds. This can disrupt community activities and hinder the rescue process.
- Communication facilities in Biringkanaya Sub-district are still limited, especially in remote areas. This can hinder coordination and communication during disasters.

Socioeconomic Factors

- Biringkanaya Sub-district has a relatively high population density of 1,549 inhabitants/km². This increases the community's vulnerability to disasters, especially during evacuation and rescue processes¹⁷.
- BPS data for Makassar shows that the poverty rate in Biringkanaya Sub-district is still classified as high, reaching 11.85% (2023). This condition makes the poor more vulnerable to the impacts of disasters^{18 19}.
- The level of education of the community in Biringkanaya Sub-district is still relatively low. This can hinder the process of education and socialization related to disaster mitigation²⁰.
- Public awareness of disaster risks in Biringkanaya Sub-district still needs to be improved. This can be seen from the fact that there are still many people living on riverbanks and landslide-prone areas²¹.

Based on the data and information above, it can be concluded that Biringkanaya Sub-district has a relatively high vulnerability to disasters, especially floods and strong winds. This is caused by several factors, such as the physical condition of the area, socioeconomic factors, and inadequate infrastructure, as well as human factors that are not environmentally friendly²². To anticipate this, the Makassar City government needs to take strategic steps to increase disaster resilience in Biringkanaya Sub-district. Some of the steps that can be taken include:²³ (i) Improving the drainage system by building new drainage, expanding and deepening existing drainage, and cleaning drainage of garbage and sedimentation, (ii) Enhancing community awareness through education and socialization related to disaster mitigation, and establishing disaster response communities at the urban village and neighborhood levels, (iii) Strengthening infrastructure by building disaster-resistant infrastructure, such as vertical housing, and improving the road, electricity, and communication

¹⁶ Badan Penanggulangan Bencana Daerah (BPBD) Kota Makassar,

¹⁷ Badan Pusat Statistik (BPS) Kota Makassar: <https://makassarkota.bps.go.id/>

¹⁸ Detikcom: <https://www.detik.com/sulsel/berita/d-7148386/32-pengungsi-banjir-di-makassar-mulai-terserang-gatal-gatal-hingga-flu>

¹⁹ Biringkanaya Kecamatan Makassar: <https://www.cnnindonesia.com/nasional/20230217133048-20-914400/banjir-setinggi-lebih-1-meter-masih-kepong-2-kecamatan-di-makassar>

²¹ Penelitian terkait kerentanan bencana di Kecamatan Biringkanaya

²² Nurhidayati, dkk. (2021). Analisis Kerentanan Bencana Banjir di Kecamatan Biringkanaya Kota Makassar Menggunakan Pendekatan Indeks Kerentanan Bencana. *Jurnal Teknik Sipil*, 10(2), 239-248. <https://iptek.its.ac.id/index.php/jats>

²³ Badan Penanggulangan Bencana Daerah (BPBD) Kota Makassar: <https://bnpb.go.id/berita/bpbd-kota-makassar>.

networks, (iv) Creating policies that are pro-poor by providing social assistance and economic empowerment programs to improve the welfare of the poor.

With these steps, it is hoped that Biringkanaya Sub-district can become a more disaster-resilient area and its people can be more prepared to face various types of disasters. Biringkanaya Sub-district, Makassar, has a relatively high vulnerability to various types of disasters, especially floods and strong winds. This is caused by several factors, such as the physical condition of the area, socioeconomic factors, and inadequate infrastructure.

It is important for the government and the community to work together to improve disaster resilience in Biringkanaya Sub-district. With strategic steps and active participation from all parties, it is hoped that Biringkanaya Sub-district can become a safer and more disaster-resilient area.

4. Findings and Analysis

4.1. Uncovering Vulnerabilities in Four Target Urban Villages

A comprehensive study of Paccerakkang Urban Village, Katimbang, Tamangapa, and Manggala in Biringkanaya and Manggala sub-districts in Makassar reveals a complex interplay of economic, social, and environmental factors that contribute to their vulnerability to floods. Here's a summary of the key vulnerabilities and their geographical distribution:

4.1.1. Economic Vulnerability

- A significant portion of respondents indicated financial hardship among residents, limiting their ability to invest in preparedness measures such as flood-resistant housing or emergency supplies. This vulnerability is likely to be more concentrated in areas with higher poverty rates.
- Reliance on informal employment, susceptible to disruption due to flooding, poses a substantial economic threat. This vulnerability may be more prevalent in specific areas with higher concentrations of informal businesses or markets.
- Economic vulnerability is likely to be more severe in certain zones within these four urban villages. Further analysis of poverty data and informal sector concentrations can identify these areas for targeted interventions.
- Regarding access to post-disaster economic recovery assistance, the data shows that a majority of respondents, nearly 60%, stated they received no assistance for their economic recovery²⁴. This highlights a gap in support for affected residents in rebuilding their livelihoods after floods. Only a small percentage, 9.5% of respondents, reported receiving economic recovery assistance. It's worth noting that a significant portion of respondents (almost 31%) indicated they were unaware of the availability of economic recovery assistance. Providing comprehensive support for economic recovery is crucial to help affected residents restore their livelihoods and regain financial stability following floods. Based on the survey results, 9.5% of respondents (46 individuals) reported receiving economic recovery assistance. These respondents mentioned various sources of assistance, including the local government, neighborhood environmental officials, other communities, family members, and other entities such as companies, universities, and NGOs. This demonstrates that support for economic recovery comes from a range of organizations and institutions. The forms of assistance received also vary and encompass various aspects of economic recovery. Examples mentioned include financial aid for business capital, equipment, training, and business premises. This indicates that the assistance provided is tailored to meet the specific needs of recipients in restarting or rebuilding their economic activities. The findings show that economic recovery assistance is available to a small portion of respondents and is derived from multiple sources. The diversity of assistance forms suggests efforts to address the specific needs of individuals and businesses affected by floods. However, better documentation and communication regarding the nature and availability of economic recovery assistance may be needed to ensure transparency and understanding among all stakeholders.

4.1.2. Social Vulnerability

- Lack of strong community support systems can hinder access to information, resources, and emotional support during emergencies. This vulnerability may be more significant in newly urbanized areas or areas with high population displacement.
- Marginalized groups such as elderly individuals living alone, single-parent households, or individuals with disabilities face additional challenges due to limited mobility or lack of support

²⁴ CLEAR Baseline survey, 2024

networks. Identifying concentrations of these groups in neighborhoods is crucial for designing support measures.

- Social vulnerability may vary across the four target urban villages. Areas with higher proportions of elderly residents or single-parent households may require specific social support programs during emergencies.

However, on the other hand, community social ties are relatively strong in the four urban villages. Community-based organizations such as Karang Taruna (youth groups), Majelis Taklim (Islamic study groups), Perkumpulan Pemuda Masjid or Gereja (youth groups in mosques or churches), and Ibu-Ibu PKK (women's empowerment groups) represent valuable social capital that can serve as a vanguard for disaster response and community-level anticipatory actions. External support from organizations like the Hasanuddin University Alumni Association and the Indonesian Red Cross (PMI) are additional social assets that can assist these urban villages in developing community-based API (Anticipatory Preparedness and Response) and PRB (Community Resilience Building) efforts.

While the vulnerability assessment paints a concerning picture, there is a bright spot in the strong social ties found in the four urban villages. These existing networks represent a valuable form of social capital that can be leveraged for disaster preparedness and anticipatory actions. Active community-based organizations like Karang Taruna (youth groups), Majelis Taklim (Islamic study groups), Perkumpulan Pemuda Masjid or Gereja (youth groups in mosques or churches), and Perkumpulan Perempuan PKK (women's empowerment groups) provide a strong foundation. Their familiarity with local needs and challenges positions them well to mobilize communities and ensure effective action.

The study also identifies external resources that can be tapped into. Organizations like the Hasanuddin University Alumni Association and the Indonesian Red Cross (PMI) are additional social assets. These institutions can act as force multipliers, providing expertise, resources, and manpower to complement and strengthen community-based efforts in disaster preparedness, risk reduction (DRR), and anticipatory actions (API) in the target urban villages. By fostering collaboration between strong community-based organizations and external support networks, a robust framework for disaster management can be built. This collaborative approach empowers communities to take ownership of their safety and well-being while leveraging external resources for maximum impact.

4.1.3. Environmental Vulnerability

- All four target urban villages are located in low-lying areas and near rivers or waterways, making them highly susceptible to flooding.
- Unsustainable land-use practices caused by, among other factors, urbanization and construction may have reduced natural flood barriers, increasing flood severity. This vulnerability may be more prominent in areas that have experienced rapid development in recent times.
- Flood hazard maps can be used to identify areas with the highest flood risk in Biringkanaya and Manggala. Additionally, slope analysis data can determine landslide-prone areas in Biringkanaya.

4.1.4. Natural Resource Vulnerability

- Due to their geographical location, all four target urban villages are situated in low-lying areas and near rivers or waterways, making them highly vulnerable to flooding.
- Environmental degradation where unsustainable land-use practices, such as deforestation and construction in landslide-prone areas, can increase disaster risk.

- Clean water availability: It is understood that disasters can disrupt access to clean water, which can lead to health problems.

4.1.5. Human Resource Vulnerability

- Limited expertise in disaster management, such as meteorologists, hydrologists, and engineers, can hinder disaster preparedness, response, and recovery efforts.
- Weak institutional capacity at the urban village and community levels can hinder the implementation of disaster management and risk reduction programs.
- Lack of coordination and communication among disaster management agencies can impede effective and efficient response during disasters.

By implementing these steps, it is hoped that the vulnerability of residents in the four target urban villages to disasters can be reduced and they can live safer and more prosperous lives.

Overall, the key findings highlight the interconnected nature of vulnerabilities across the four target urban villages of the CLEAR program in Biringkanaya and Manggala sub-districts. Certain areas may be more susceptible to specific vulnerabilities based on their economic conditions, social composition, and environmental characteristics. By understanding this geographical distribution, stakeholders can design targeted strategies to address vulnerabilities in the most effective manner.

4.2. Vulnerability Assessment

4.2.1. Defining Vulnerability in Context

Vulnerability is a term widely used in various fields, but its core meaning remains the same: the susceptibility of something to harm or threat. However, the specifics of what constitutes a "hazard/threat" and the factors that contribute to that vulnerability can vary greatly depending on the context. Here, we will delve deeper into the understanding of vulnerability in various scenarios.

At its core, vulnerability refers to the diminished capacity of individuals, groups, communities, or even entire systems to withstand, resist, and recover from negative external forces. These forces can be natural disasters such as floods or earthquakes, human-made threats such as pollution or economic decline, or social issues such as discrimination or poverty.

To fully understand vulnerability, it is essential to consider the key components of vulnerability, which consist of three elements: (i) **Exposure**, this refers to the likelihood of encountering a harmful force or threat. For instance, a coastal city has a high risk of being affected by storms, while a city with no coastline has a lower risk. (ii) **Sensitivity**, this describes the extent to which a system is negatively impacted by the threat. Densely populated areas with limited evacuation routes are far more sensitive to floods compared to sparsely populated rural areas. (iii) **Resilience**, this represents the capacity to bounce back from negative impacts. Communities with strong social networks, robust infrastructure, and emergency preparedness plans will have higher resilience compared to communities lacking these resources.

4.2.2. Understanding Vulnerability Across Different Fields

Vulnerability is a central concept in Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA). By identifying the communities or regions most vulnerable to disasters, stakeholders can develop targeted mitigation strategies, preparedness plans, and early warning systems. This minimizes the impact of disasters on lives and property.

Climate change acts as a vulnerability amplifier. Rising sea levels, increasing frequency and intensity of extreme weather events such as droughts and floods, all contribute to higher vulnerability for communities with limited resources to adapt.

Social vulnerability factors are closely linked to socioeconomic factors such as poverty, limited access to healthcare and education, and social marginalization can significantly increase vulnerability. These factors limit the ability of individuals or communities to cope with hardships, be it natural disasters, economic crises, or public health emergencies.

Public health issues form the basis of vulnerability analysis, helping to identify populations at high risk to specific health threats. Older adults or those with chronic illnesses may be more susceptible to infectious diseases or complications from pollution.

Regarding strategies to address vulnerability, there is no single solution to overcome vulnerability. However, a multi-dimensional approach is most effective, including: (i) **Mitigation**, this involves reducing the likelihood or intensity of the harmful force itself. For instance, building seawalls can reduce flood risk in coastal areas. (ii) **Adaptation**, this focuses on enhancing the ability of systems to adjust to changing conditions. Developing drought-resistant crops helps communities adapt to changing weather patterns. (iii) **Capacity Building**, this involves empowering communities by increasing access to resources such as education, healthcare, and infrastructure. This empowers them to be more resilient in facing challenges. (iv) **Social Protection Programs**, these provide safety nets such as shelters and financial assistance to vulnerable groups during crises. This can help them meet immediate needs and rebuild their lives.

Therefore, understanding vulnerability is crucial for creating a safer and more equitable future. By identifying the most at-risk areas and populations, resources can be allocated efficiently. Targeted interventions can be designed to address specific vulnerabilities, which ultimately helps build more resilient communities better prepared to face various challenges.

Vulnerability is a dynamic concept that continuously evolves based on context. By recognizing the factors that contribute to it, we can move towards a future where communities are empowered and ready to thrive, even in the face of adversity.

4.2.3. Vulnerability in the Four Target Urban Villages of the CLEAR Program

Paccerrakkang, Katimbang, Tamangapa, and Manggala urban villages, located in Biringkanaya and Manggala sub-districts, face significant vulnerability to various threats. Understanding the specific vulnerabilities in each area is crucial for developing effective mitigation and adaptation strategies.

The four target urban villages in these two sub-districts have a primary threat: flood risk. Both areas have low elevations and flat topography, making them susceptible to flooding during heavy rains or river overflows. This is further exacerbated by inadequate drainage systems, which can worsen flooding. Both sub-districts also have limited infrastructure: The lack of robust infrastructure, including well-maintained roads and flood control measures, increases the severity of flooding and hinders rescue and recovery efforts. Another important factor is socioeconomic factors, where poverty and limited access to education and healthcare can significantly increase vulnerability. These factors limit residents' capacity to prepare for disasters, cope with their impacts, and rebuild their lives.

Biringkanaya has a higher population density compared to Manggala. This can lead to greater challenges during evacuation and increase the risk of casualties during floods. In terms of topography, while most of Biringkanaya is flat, some areas have slopes. These areas are more prone to landslides during heavy rains, especially if proper drainage and erosion control are not implemented.

In Manggala sub-district, most of Manggala's population relies on the informal sector for their livelihoods. This sector is often more vulnerable to disruption caused by disasters, potentially leading to economic hardship and social unrest. Manggala also has a level of public understanding and preparedness for disasters that needs to be improved. These challenges can hinder timely evacuation and response during emergencies.

It can be concluded that Biringkanaya and Manggala face different but overlapping vulnerabilities. A comprehensive understanding of these vulnerabilities, coupled with a multi-pronged approach that addresses infrastructure gaps, strengthens communities, and promotes preparedness, is essential to building a more resilient Makassar. By working together, stakeholders can create a future where neighborhoods are better prepared to face the challenges posed by natural disasters and other threats.

4.2.4. Identification of Vulnerable Groups

The four target urban villages in the Biringkanaya and Manggala sub-districts of Makassar face various disaster risks, particularly floods, droughts, and extreme weather. However, the impact of these disasters is not evenly distributed. Certain groups within the population are more vulnerable due to physical limitations, social marginalization, or economic constraints. Identifying these vulnerable groups is crucial for developing targeted disaster risk reduction (DRR) and climate change adaptation (CCA) programs and ensuring that everyone has the opportunity to prepare for and recover from emergencies.

Vulnerable groups are generally divided into several categories, including:

- **Children:** Due to their developing physical and cognitive abilities, children are often less aware of potential hazards and have a limited capacity to respond effectively during emergencies ²⁵. They may have difficulty evacuating on their own, understanding safety instructions, and coping with the psychological trauma caused by disasters ²⁶.
- **Elderly:** As people age, physical limitations and chronic health conditions can hinder mobility and self-care during disasters²⁷. Evacuating during floods or navigating damaged infrastructure may be challenging for the elderly. Additionally, they may require special medical attention during emergencies, which may be scarce in the aftermath of a disaster.
- **People with disabilities:** People with disabilities face unique challenges during disasters. Physical limitations can make evacuation difficult, and inaccessible shelters or communication barriers can further exacerbate their vulnerability. Additionally, individuals with sensory disabilities may require special assistance during emergencies.
- **Economically disadvantaged:** Poverty is a significant vulnerability factor. Low-income families often live in poorly constructed housing in flood-prone areas. They may lack the resources to

²⁵ Twigg, J. (2007). Children and disaster risk reduction: A review of the literature.

https://www.oxfordbibliographies.com/browse?module_o=obo-9780199791231

²⁶ Norris, F. H., Friedman, M. J., & Watson, P. J. (2002). 6667: Children's reactions to disaster. *Journal of Child Psychology and Psychiatry*, 43(5), 561-572.

https://www.sciencedirect.com/science/article/pii/S014664029190002R/pdf?md5=e3cd611e9e7f1fb7e524fc5fce2c09a8&pid=1-s2.0-014664029190002R-main.pdf&_valck=1

²⁷ J Peek, L. (2008). The emerging vulnerabilities of older adults in disasters. *Journal of Gerontological Nursing*, 34(6), 10-16

prepare for disasters, rebuild damaged homes, or cope with the loss of income caused by business disruptions.

Vulnerability in the four target urban villages is triggered by several factors. Higher population density, especially in Biringkanaya sub-district, can lead to particular challenges in evacuating children and elderly people during emergencies. Crowded spaces and limited resources can further complicate the situation. Additionally, Manggala sub-district's reliance on the informal sector can make economically disadvantaged residents vulnerable. Loss of income due to disasters can severely impact their livelihoods and push them further into poverty. Moreover, informal workers may not have access to social safety nets or insurance, limiting their ability to recover.

4.3. Criteria and Indicators for the Study

4.3.1. Assessment Criteria and Indicators for the Four Target Urban Villages

Paccerrakang, Katimbang, Tamangapa, and Manggala urban villages face significant vulnerability to disasters, particularly floods and droughts. To effectively address these challenges, a comprehensive assessment is crucial. This assessment delves into two main aspects: environmental vulnerability itself and the specific vulnerabilities faced by various groups within society. By using a set of well-defined criteria and indicators, stakeholders can gain a comprehensive understanding of the risks and tailor strategies to create more resilient communities and territories in the future.

The study considers three main criteria to understand the vulnerability of Biringkanaya and Manggala sub-districts to floods:

1. Exposure

This criterion focuses on the likelihood of a flood event occurring. The indicators provide insights into the flood threat. These include:

- a. Historical Data: Analyzing past flood records provides valuable insights. This includes the frequency, intensity, and areas affected by past floods.
- b. Flood Hazard Maps: These maps show flood-prone zones in the neighborhoods, allowing for a spatial understanding of the risk.
- c. Proximity to Water Bodies: Rivers, reservoirs, or other water bodies influence their vulnerability to flooding.

2. Sensitivity

This criterion assesses how severely floods impact the environment. Sensitivity indicators reveal the potential impact of floods:

- a. High Population Density: This poses challenges during evacuation and can lead to higher casualties in the event of major floods.
- b. Housing Quality: The prevalence of poorly constructed housing significantly increases vulnerability. Such structures are more prone to damage and collapse during floods.
- c. Presence of Sloping Terrain: In Biringkanaya, sloping terrain is more susceptible to landslides triggered by heavy rains, posing an additional threat.

3. Resilience

This criterion evaluates the ability of Biringkanaya and Manggala to bounce back from floods. Resilience indicators highlight the capacity to recover:

- a. Infrastructure: The adequacy of drainage systems, flood control measures, and road networks determines the ability to withstand and manage floodwaters.
- b. Social Capital: The strength of community networks and support systems plays a crucial role in facilitating post-disaster recovery efforts.

- c. **Access to Resources:** The availability of financial assistance, healthcare, and building materials after a flood is essential for residents to rebuild their lives.

4.3.2. Identifying Vulnerable Groups in the Neighborhoods

The overall vulnerability assessment needs to be further refined by focusing on specific groups within the population. Here, indicators for each vulnerable group help identify their unique needs

Children: Due to their age and developmental stage, younger children require more assistance during emergencies. Their limited physical and cognitive abilities make it difficult to evacuate on their own or fully understand safety instructions. Providing access to educational programs on disaster preparedness specifically designed for children is crucial.

Elderly: Physical limitations and chronic health conditions, common among the elderly, can hinder their mobility and self-care during disasters. This can make evacuation and fulfilling basic needs challenging. Ensuring access to healthcare and medication during emergencies is vital for the elderly. In some cases, they may require assistance during evacuation due to physical limitations.

People with disabilities: The specific nature of a disability determines the type of assistance needed during evacuation and daily life after a disaster. Individuals with certain disabilities may require special equipment or trained personnel to facilitate safe evacuation. Physical barriers in shelters and evacuation routes can significantly hinder accessibility for people with disabilities.

Economically disadvantaged. Low income and limited access to resources can significantly limit a person's ability to prepare for and recover from disasters. Low-income families often live in flood-prone areas with poor housing construction, further increasing their vulnerability. Jobs in the informal sector are often vulnerable to disruptions caused by disasters, leading to income loss and exacerbating economic hardship.

4.4. Vulnerability Analysis

4.4.1. Diverse Threats: Analyzing Vulnerability in the Four Target Urban Villages of Biringkanaya and Manggala Sub-districts

The four target urban villages face significant vulnerability to disasters, particularly floods. This vulnerability stems from a complex interplay of human, natural/environmental, economic, social, and infrastructure factors. By analyzing these interconnected elements, stakeholders can develop targeted strategies to mitigate risks and build resilience.

Investing in environmental protection efforts such as restoring natural habitats and improving drainage systems is crucial for reducing environmental vulnerability. Additionally, promoting sustainable land-use practices and enforcing building regulations in flood-prone areas can prevent further development that increases risk.

The four target urban villages (Pacerakkang, Katimbang, Tamangapa, and Manggala) in Biringkanaya and Manggala sub-districts of Makassar face significant vulnerability to floods due to a complex interplay of natural, human, social, economic, and infrastructure factors. A comprehensive understanding of these factors is essential for developing effective disaster risk reduction (DRR) strategies and building community resilience.

Natural Factors

The environmental and natural context in the four target urban villages also contributes to community vulnerability:

- The four urban villages are located in low-lying areas and near waterways or rivers, making them highly susceptible to flooding.
- Unsustainable practices, such as urbanization and settlement construction, have reduced water absorption areas and natural flood barriers like wetlands. This can increase the volume and speed of floodwaters, leading to more severe damage.
- Poor waste management practices can also potentially lead to clogged drainage systems, exacerbating flooding by impeding water flow.
- Climate Change: Increased rainfall intensity and frequency due to climate change further amplify the flood hazard.

Human Factors

- Limited Financial Resources leading to poverty and lack of access to financial services hinder residents' ability to invest in flood-resistant housing, early warning systems, and livelihood recovery efforts.
- Lack of Education and Awareness, such as limited knowledge about flood risks, preparedness measures, and evacuation procedures, increases vulnerability.
- Weak Social Support Systems, such as fragile social networks and a lack of community cohesion, hinder access to information, resources, and emotional support during emergencies.
- Marginalized Groups, such as elderly people living alone, single-parent households, and people with disabilities, face additional challenges due to mobility limitations and lack of support.

Social Factors

Social factors also contribute to the vulnerability of the four target urban villages:

- While some residents have strong family ties, the lack of broader social networks can hinder community-based support systems during emergencies. This can make it difficult for communities to access information, resources, or emotional support after a flood disaster.
- Marginalized groups within these communities, such as elderly people living alone or single-parent households, may face additional challenges due to limited mobility or lack of childcare options during emergencies.
- Lack of awareness about flood risks, evacuation procedures, and safety measures can increase vulnerability. Residents may not know when and where to evacuate, how to secure their homes, or how to stay safe during a flood.
- Unplanned urbanization and population growth strain infrastructure and increase exposure to hazards.
- Social Exclusion and Discrimination, where marginalized groups based on ethnicity, gender, or disability may face barriers in accessing essential services and disaster preparedness programs.
- Cultural Practices and Beliefs, such as considerations for local customs and beliefs, are crucial for culturally sensitive and effective DRR interventions.

Strong social structures and effective communication are essential for building social resilience. Promoting community preparedness programs, establishing early warning systems, and facilitating communication channels can empower residents to respond effectively during disasters and support each other in the aftermath.

Economic Factors

Some economic vulnerabilities that can exacerbate the impact of floods include:

- Limited Financial Resources where many residents in these communities are low-income and struggle to meet basic needs. This makes it difficult to invest in flood preparedness measures, such as reinforcing homes, purchasing floodgates, or obtaining flood insurance.
- Reliance on the Informal Sector where a significant portion of the workforce in these areas depends on informal work in sectors like construction or street vending. These jobs often lack security and social safety nets. Floods can disrupt these jobs, leading to immediate income loss and hindering post-disaster recovery efforts.
- Limited Access to Credit, especially for those who want to invest in preparedness measures. Access to loans may be limited. Banks may be hesitant to lend to low-income individuals or may offer loans at high-interest rates, further straining their financial resources.
- Limited Insurance Coverage or inadequate insurance penetration makes individuals and businesses vulnerable to financial losses after a disaster.

The consequences of economic vulnerability become apparent in the aftermath of a flood. Residents may struggle to afford repairs to damaged homes, replace lost possessions, or rebuild their livelihoods. This can worsen existing poverty and create a cycle of debt.

Infrastructure Factors

- Inadequate Drainage Systems: Poorly maintained or inadequate drainage systems exacerbate flooding, particularly in urban areas.
- Vulnerable Housing: Lack of flood-resistant construction and housing practices increases the risk of structural damage and loss of life.
- Limited Early Warning Systems: Inconsistent or ineffective early warning systems hinder timely evacuation and preparedness actions.

By implementing comprehensive resilience actions and fostering a culture of preparedness, the four target urban villages can significantly reduce their vulnerability to floods and build a safer and more prosperous future for their residents.

4.5. Strategies to Reduce Vulnerability

- Develop inclusive DRR programs: This includes creating child-friendly evacuation plans, training caregivers on how to assist children during emergencies, and ensuring shelters are accessible to people with disabilities.
- Implement social safety net programs: Provide financial assistance and basic needs to vulnerable groups after a disaster to help them meet immediate needs and rebuild their lives.
- Conduct targeted community outreach: Focus on areas with high concentrations of vulnerable groups. This may involve raising awareness about disaster risks, providing training on evacuation procedures, and identifying individuals who may require additional support during emergencies.
- Invest in accessible infrastructure: Ensure essential infrastructure like shelters, evacuation routes, and public transportation is accessible to people with disabilities. This could include installing ramps and providing alternative transportation options for those who cannot evacuate independently.

By identifying vulnerable groups in the four CLEAR program target urban villages, stakeholders can tailor DRR strategies to ensure everyone has an equal opportunity to survive, be resilient, and recover from disasters. Inclusive programs, social safety nets, and accessible infrastructure are crucial for

building more resilient and equitable communities. By empowering all residents to prepare and respond effectively, Makassar will be better equipped to face the challenges posed by natural disasters.

4.6. Actions for Resilience

By analyzing the economic, social, natural resource/environmental, human, and infrastructure vulnerabilities in the four target urban villages, stakeholders can address the identified vulnerabilities and build resilience by developing comprehensive climate change adaptation and disaster risk reduction strategies. These strategies should include:

4.6.1. Economic Resilience

- Microfinance programs: Provide access to small loans to help residents invest in flood prevention measures and rebuild their livelihoods after a disaster, including investing in flood-resistant housing, diversifying livelihoods, and implementing disaster preparedness measures.
- Support local governments in expanding social safety net programs: This could include cash assistance, food aid, and livelihood support to protect vulnerable groups during and after disasters.
- Diversify livelihoods: Promote alternative livelihood options, such as vocational training and access to markets, to reduce reliance on flood-prone sectors and enhance economic resilience.

4.6.2. Social Resilience

- Social safety nets: Implement social safety net programs to ensure vulnerable groups receive financial assistance and essential supplies after a flood disaster.
- Community-based DRR/PB action: Empower communities to lead DRR initiatives, foster social cohesion, share knowledge, and take collective action.
- Inclusive and equitable DRR/PB: Ensure program strategies are inclusive, accessible, and responsive to the needs of marginalized groups, addressing underlying social inequalities.
- Cultural sensitivity: Integrate local customs, beliefs, and traditional knowledge into DRR programs to enhance community engagement and effectiveness.

4.6.3. Environmental Resilience

- Environmental restoration projects: Invest in projects that restore natural flood barriers and improve drainage systems to reduce the impact of future floods.
- Ecosystem restoration: Support investments in ecosystem restoration projects, such as reforestation and wetland conservation, to enhance natural flood defenses and reduce runoff.
- Support for sustainable land-use planning policies: Consider flood risks, promote erosion control, and protect natural ecosystems.
- Support for designing and building infrastructure resilient: Consider the impacts of climate change, including extreme rainfall and sea-level rise.

4.6.4. Human Resilience

- Community outreach programs: Organize workshops and awareness campaigns to educate residents about flood risks, preparedness measures, and evacuation procedures.

- Implement comprehensive disaster education programs: Target all segments of society, including marginalized groups, to increase risk perception, knowledge, and preparedness.
- Capacity building and training: Support regular training opportunities in disaster preparedness, first aid, life skills, and psychosocial support for individuals and community members.
- Mental health and psychosocial support: Integrate psychosocial services into disaster preparedness, response, and recovery efforts, providing counseling, stress management techniques, and trauma-informed care.

4.6.5. Infrastructure Resilience

- Support investments in upgrading and expanding drainage systems: Improve water flow and reduce potential flooding, particularly in low-lying areas.
- Support the development and enforcement of building codes: Mandate flood-resistant design and construction practices for new and existing structures.
- Support the construction and maintenance of robust early warning systems: Disseminate timely and accurate flood warnings through multiple channels accessible to all residents.

By comprehensively addressing the natural, human, social, economic, and infrastructure factors that contribute to flood vulnerability, the four target urban villages can build a more resilient future. This requires collaborative efforts among government agencies, local communities, civil society organizations, and the private sector to implement the outlined actions. Investing in disaster risk reduction strategies will save costs in the long run, reduce human and economic losses from floods, and create a safer and more sustainable future for all residents.

4.7. Additional Considerations

Monitoring and evaluation are conducted to regularly monitor and evaluate the effectiveness of DRR interventions, adjusting strategies as needed based on learnings. This is complemented by efforts to support the use of innovative technologies, such as remote sensing and flood modeling tools, to improve risk assessment, early warning systems, and disaster response.

Another relevant aspect is exploring sustainable funding mechanisms for anticipatory action and DRR initiatives, such as public-private partnerships, risk financing instruments, and community-based resource mobilization.

5. Vulnerability Assessment

5.1. Vulnerability Assessment: Mapping Risks and Needs

A comprehensive vulnerability assessment in the four target urban villages aims to identify various aspects, including:

- Economic Vulnerability: Limited financial resources can hinder residents' ability to invest in preparedness measures like flood-resistant houses or emergency supplies.
- Social Vulnerability: Weak social networks, lack of flood risk awareness, or the presence of marginalized groups with limited mobility can increase vulnerability.
- Environmental Vulnerability: Settlements in low-lying areas or near waterways, coupled with unsustainable land-use practices, can exacerbate flood risks.
- Human Resource Vulnerability: Limited knowledge about flood risks, preparedness measures, and evacuation procedures increases vulnerability. Marginalized groups like the elderly living alone, single-parent households, and people with disabilities face additional challenges due to mobility limitations and lack of support.
- Infrastructure Vulnerability: Inadequate drainage systems, flood-prone housing and construction, and inconsistent or ineffective early warning systems hinder evacuation and preparedness actions.

5.2. Strengths and Weaknesses in Building Resilience in the Four Target Urban Villages

The four urban villages face significant vulnerability to disasters, particularly floods. However, within these communities, there are many strengths and weaknesses to consider when building resilience. Understanding these aspects can help INANTA and stakeholders develop more effective implementation strategies for the CLEAR program.

5.2.1. Community Strengths

- Residents have deep local knowledge and understanding of their environment, past flood events, and unique vulnerabilities. This local knowledge is valuable for informing DRR strategies and can be effectively utilized through participatory approaches.
- While some areas may have limited social networks, others may have strong community bonds. These networks can provide crucial support during and after disasters, fostering collective resilience.
- A strong community spirit can motivate residents to work together on preparedness initiatives and provide mutual assistance during emergencies.
- M&E issues are recognized by communities working in the formal sector as important and integral to planning and budgeting urban village development programs.

5.2.2. Community Weakness

- Many residents in the four urban villages face economic hardship, limiting their ability to invest in preparedness measures or recover from flood losses. Economic Vulnerability: This can exacerbate the impact of disasters.
- Limited awareness of flood risks, evacuation procedures, and safety measures can increase vulnerability. This highlights the need for targeted outreach, training, and education programs.
- Urbanization and development, particularly large-scale housing, may have reduced natural flood barriers and increased flood severity. Additionally, poor waste management practices can worsen

flooding by clogging drainage systems. Unsustainable practices like these increase the area's vulnerability and harm the environment.

- M&E issues are not well understood by some community members not directly involved in the formal sector, such as marginalized communities and the general public. Some even view M&E as a sensitive topic for discussion between the community and the government.

It is important to recognize that these community strengths and weaknesses may not be evenly distributed across the four target sub-districts. Some areas may have stronger community spirit, while others may struggle with limited social networks. Similarly, economic vulnerability may be more concentrated in certain areas.

Understanding the interactions between strengths and weaknesses is also crucial. For instance, strong community spirit can help address economic limitations by encouraging collective action and resource sharing during preparedness efforts. However, a lack of flood risk awareness can hinder the efforts of even the most well-intentioned communities.

In conclusion, by understanding the strengths and weaknesses of the four target urban villages in Biringkanaya and Manggala sub-districts, INANTA and stakeholders can develop a deeper understanding of community capacities to cope with floods. Leveraging existing strengths and addressing weaknesses through targeted interventions is crucial for building a more resilient future for these areas. Focusing on financial literacy programs, public awareness campaigns, and promoting sustainable land-use practices can empower residents and foster a collective approach to risk reduction.

5.3. Identifying API and DRR Priority Areas in the Four Target Urban Villages

To effectively reduce flood risks and build resilience, it is crucial to identify key priority areas for targeted CLEAR program interventions. A range of efforts can be undertaken to build community resilience. These include:

5.3.1. Data Integration and Analysis

- Analyze data from the vulnerability assessment to identify areas with high economic vulnerability (limited financial resources), social vulnerability (weak social networks, marginalized groups), and environmental vulnerability (low-lying areas, flood-prone zones).
- Integrate findings from M&E systems, focusing on areas with low participation in preparedness activities, low awareness levels, or limited program effectiveness.
- Utilize GIS (Geographic Information System) to overlay vulnerability data with spatial information such as flood hazard maps and socio-economic data (poverty levels, demographics).

5.3.2. Community Engagement

- Conduct participatory mapping workshops where residents can identify flood-prone areas, evacuation routes, and critical infrastructure (hospitals, schools, and places of worship) on large maps. This can reveal areas with specific vulnerabilities not captured by traditional data collection methods.
- Organize Focus Group Discussions with residents from diverse areas to understand their specific concerns, priorities, and existing preparedness capacities. This can help identify areas with unique challenges or a lack of awareness about DRR initiatives.

5.3.3. Prioritization Framework

- Prioritize areas with high levels of vulnerability (economic, social, environmental) and high flood risk for immediate intervention.
- Areas with low participation and limited capacity in implementing CLEAR program (early action) or weak social networks require additional support and targeted outreach efforts.
- Focus on areas where interventions can have the most significant impact in reducing overall flood risk and enhancing community preparedness.

5.3.4. Examples of Key Priority Areas

- Areas that may require financial assistance programs for flood-proofing measures or social safety nets to ensure post-disaster recovery.
- Areas identified as low-lying environments with high poverty levels and lacking strong social networks. These communities can benefit from initiatives promoting environmental monitoring programs or establishing evacuation shelters with trained personnel.
- Locations with unsustainable land-use practices may require interventions such as watershed restoration projects, mangrove reforestation, or drainage system improvements, along with capacity building through education and training on sustainable development practices.

In summary, by integrating data analysis, community engagement, and a clear prioritization framework, the four target urban villages can identify key areas for more focused CLEAR program interventions. This targeted approach optimizes resource allocation, addresses the most pressing vulnerabilities, and empowers at-risk communities to become active participants in building a more resilient future. It is important to recognize that this is an iterative process, and as API and DRR efforts progress, the identification of key priority areas may need to be revisited and adapted based on ongoing monitoring and evaluation results.

6. Recommendations

6.1. Short-Term Interventions to Enhance Resilience

To address these pressing issues, a series of short-term interventions can be implemented while laying the groundwork for long-term resilience building. Here is a breakdown of some crucial short-term actions:

6.1.1. Raising Awareness and Enhancing Community Capacity

- Conduct community outreach campaigns through training, workshops, information sessions, and public awareness campaigns using various channels (local media, community leaders, religious institutions) to increase residents' knowledge and understanding of flood risks, evacuation procedures, and safety measures.
- Provide training sessions for residents on basic first aid and CPR skills, empowering them to respond effectively during emergencies.
- Conduct evacuation drills based on realistic scenarios to familiarize residents with evacuation routes, designated shelters, and assembly points. This promotes preparedness and reduces confusion during disasters, especially floods.
- Develop engaging and easy-to-understand IEC materials, complete with pictures and practical information, using local language with elements of games and simulations, competitions, or on specific occasions such as the commemoration of August 17, Disaster Preparedness Day, DRR Month, Environment Day, Earth Day, and so on.

6.1.2. Resource Mobilization and Distribution

- Emergency stockpile management by building and maintaining essential stockpiles such as food, water, sanitation supplies, and hygiene products through collaboration with local CBOs or NGOs and community organizations. Ensure that this pre-positioning/storage is strategically located in flood-prone areas for easy access during emergencies.
- Targeted CVA Financial Assistance through the development of a short-term financial assistance program for low-income households to help them meet immediate needs such as temporary housing, food security, or minor repairs to flood-damaged homes. This could also be an integral part of the third building block; risk financing in anticipatory action. Support from family funds would be excellent to ensure the sustainability of activities at the community level.

6.1.3. Infrastructure Improvement and Environmental Actions

- Drainage System Maintenance by prioritizing the cleaning and maintenance of existing drainage systems to improve water flow and reduce the risk of flooding due to clogged waterways. This can be achieved through community mobilization efforts or collaboration with local governments.
- Coordinate early preventive measures to protect homes from floods, such as sandbag distribution.

6.1.4. Harnessing Community Strength

- Work with community members to form urban village disaster response teams (part of the KSB) trained in basic disaster response skills such as search and rescue, first aid, and damage assessment. This empowers residents to take an active role in emergency response efforts.
- Identify, map, and strengthen existing social networks within the community. This can be facilitated by supporting local community organizations and promoting environmental monitoring programs, fostering a sense of collective responsibility and mutual support during emergencies.

These short-term interventions aim to address existing vulnerabilities and equip the four target urban villages with a basic level of preparedness. While these efforts provide crucial support in facing flood risks, they should be seen as a stepping stone towards long-term resilience-building initiatives. By combining these short-term actions with long-term strategies that address underlying vulnerabilities and promote sustainable development practices, these four target urban villages can create a safer future for all residents.

6.2. Sustainable Strategies for Long-Term Resilience Building

While short-term interventions are crucial for reducing flood risks in CLEAR program locations, a long-term vision is also essential for building sustainable resilience. Here is a breakdown of key long-term strategies:

6.2.1. Infrastructure Investment and Land Use Planning

- Collaborate with local authorities to explore long-term flood protection measures such as constructing dikes, dams, or even elevated roads in critical areas.
- Invest in drainage infrastructure upgrades to handle increased water flow, considering sustainable solutions such as bioswales or permeable pavement.
- Implement stricter land-use regulations to prevent development in high-flood-risk zones and promote environmentally friendly infrastructure projects like urban forests or parks that can function as natural flood buffers. This includes the percentage of open land area to closed land area for water absorption into the ground and reducing excessive surface runoff that causes flooding.

6.2.2. Risk Financing and Livelihood Support

In the face of rising flood risks, microfinance and community empowerment programs need to adopt a comprehensive and sustainable approach to building flood resilience and improving the livelihoods of communities, particularly vulnerable groups. One key strategy is to promote livelihood diversification through group-based business development.

Livelihood diversification can reduce economic vulnerability. Focusing on group-based business development can help:

- Increase income and economic opportunities: Diverse businesses run together can increase the income and standard of living of group members and the community as a whole. This can reduce reliance on flood-prone sectors and enhance community economic resilience.
- Create jobs: Group business development can create new jobs, especially for vulnerable groups such as women, youth, and people with disabilities.
- Open access to markets: Business groups can work together to open access to wider markets, increase sales of their products and services, and strengthen their competitiveness.

Diversification of businesses for economic resilience is an aspiration of the target community. The results of FGDs in the four urban villages have identified several forms of microfinance programs that are expected to facilitate livelihood diversification by providing access to capital and training for various types of businesses, such as:

- Grocery trade: providing loans to open or expand grocery stores, especially in flood-prone areas, to provide access to basic necessities for the community.
- Culinary business: supporting food businesses, such as eateries, catering, or online food businesses, that can operate in various conditions, including post-floods.
- Online motorcycle taxis: supporting the ownership or rental of vehicles or smartphones for online motorcycle taxi businesses, which offer flexibility and income opportunities during difficult times.
- Family hydroponics: enabling the sustainable production of fresh and nutritious food, even in limited and flood-affected areas.

This business diversification can then be developed through the power of Collaboration and Business Groups using a group business approach. This strategy offers several significant advantages:

- Shared knowledge and experience: where group members can share knowledge, experience, and expertise in various fields of business, increasing the chances of success and innovation.
- Shared resources between groups: optimizing shared resources, such as equipment, raw materials, or market access, to improve efficiency and reduce costs.
- Mutual support and strengthening: with motivation between group members, it can increase spirit, resilience, and resilience in the face of challenges and obstacles.
- Shared responsibility with fair sharing of risks and benefits in joint ventures: can strengthen solidarity and build a sense of belonging among group members.

These efforts can build a disaster-resilient community. Through a combination of livelihood diversification and group business power, microfinance programs can contribute to:

- Increased income and well-being: where diverse businesses developed through groups can increase the income and standard of living of group members and the community as a whole.

- Business and income source diversification: can help communities have stronger disaster resilience, be better prepared for the economic impacts of floods, and recover faster after disasters.
- Successful business groups: can drive local economic development and growth, create jobs, and increase access to products and services.
- Collaboration and mutual cooperation in business groups: can strengthen networks and social cohesion, trust, and a sense of belonging among community members.

Microfinance programs that focus on livelihood diversification and group business empowerment can be an effective solution for building flood resilience, improving community well-being, and promoting inclusive and sustainable economic development. However, it is important to note that the success of this program depends on a well-designed program, comprehensive training, ongoing support, and adequate market access. The role of government and non-governmental organizations is crucial in facilitating this program, providing the necessary infrastructure, and creating an environment conducive to group business development. Active participation and leadership from communities, especially vulnerable groups, are essential to ensure the success and sustainability of this program. With strong collaboration and commitment from various parties, microfinance and group business empowerment programs can be powerful tools for building more resilient and prosperous communities amidst rising flood risks.

6.2.3. Institutional Strengthening and Collaboration

- Support the Regional Disaster Management Agency (BPBD) to provide resource support and training to local Disaster Response Teams (KSB) to enhance their capacity in disaster preparedness, response, and recovery efforts.
- Develop urban village or sub-district-level DRR Forums in the concept of Disaster-Resilient Sub-districts (*KENCANA/Kecamatan Tangguh Bencana*) consisting of multi-stakeholders that bring together government agencies, NGOs, community leaders, the business community, and the public to facilitate dialogue, collaboration, and resource sharing for DRR initiatives.
- Develop a comprehensive knowledge management system to document best practices, lessons learned, and local knowledge related to flood risks. This information can be shared with stakeholders and future generations to ensure continuous improvement in DRR strategies.

6.2.4. Environmental Sustainability and Risk Reduction

- Support initiatives focused on restoring degraded watershed areas, which act as natural buffers against floods.
- Conduct public education programs on Sustainability to raise awareness about environmental factors that contribute to flooding and promote sustainable practices such as waste management and water conservation.

By implementing these long-term strategies, the four target urban villages can do more than just react to floods and proactively build a more resilient future. A comprehensive approach that combines infrastructure development, community empowerment, institutional collaboration, and environmental sustainability equips residents with the tools and knowledge they need to address future flood risks and create a safer and more sustainable future for generations to come.

6.3. Community Empowerment through Participation and Capacity Building

Building flood resilience requires a strong foundation in community engagement and capacity building. By empowering residents and fostering a sense of ownership over API and DRR efforts, the effectiveness of programs will significantly increase.

6.3.1. Building Trust and Inclusive Communication

- Shift away from traditional top-down communication by using participatory approaches such as community meetings, focus group discussions, and workshops. This allows residents to actively voice their concerns, priorities, and local knowledge, fostering a sense of trust and ownership of the DRR process.
- Ensure that information about flood risks, preparedness measures, and community initiatives is disseminated in multiple languages to reach all residents, regardless of literacy level. This promotes inclusivity and ensures that everyone has access to critical information.
- Utilize existing local communication channels that are trusted by residents, such as community leaders, religious institutions, and local media, to spread information about DRR programs and activities.

6.3.2. Cultivating a Culture of Preparedness

- Conduct public awareness campaigns on education using a variety of communication methods (posters, radio announcements, community theater) to raise awareness about flood risks, evacuation procedures, and safety measures.
- Integrate DRR education into school curricula to equip younger generations with the knowledge and skills they need to prepare for and respond to floods. This instills a culture of preparedness that will continue into future generations.
- Partner with urban village governments, communities, and KSBs to form Urban Village Emergency Response Teams. These teams are trained in basic search and rescue, first aid, and damage assessment, empowering residents to take an active role in emergency response efforts, fostering a sense of collective responsibility.

6.3.3. Capacity Building and Skills Development

- Provide livelihood diversification training programs: that equip residents with the skills to undertake income-generating activities outside of flood-prone sectors. This not only reduces economic vulnerability but also empowers residents to invest in preparedness measures for their homes and families.
- Consult with local governments on flood-resistant construction techniques and designs: through workshops on flood-resistant housing. This could include raising electrical components or using water-resistant materials, and equip residents with the knowledge and skills to make their homes more resilient to flood damage.
- Community-based monitoring: by training residents on basic data collection techniques and involving them in monitoring flood risks and the effectiveness of DRR programs. This fosters a sense of ownership and empowers residents to become active participants in the monitoring and evaluation process.

6.3.4. Utilizing Local Knowledge and Traditional Practices

- Conduct participatory mapping workshops: where residents can map flood-prone areas, evacuation routes, and critical infrastructure. This allows local knowledge to feed into DRR strategies and can uncover vulnerabilities that may not be captured by traditional data collection methods.
- Respect local wisdom: by acknowledging and integrating traditional practices for flood preparedness and mitigation that may exist within communities. This demonstrates respect for local knowledge and can lead to more culturally appropriate and effective DRR strategies.

By prioritizing community engagement and capacity building, the four target locations can move away from reliance on external actors and empower residents to become active partners in building resilience. This fosters a sense of ownership, strengthens the effectiveness of DRR programs, and ultimately leads to a safer future for all community members. Remember, this is an ongoing process

that requires continuous communication, collaboration, and adaptation to ensure that communities remain engaged and actively empowered over the long term.

6.4. Policy Recommendations for Building Resilience in the Four Target Urban Villages

The four target urban villages are undoubtedly facing the threat of severe seasonal floods. However, through well-designed policies, these communities can build a more resilient future. Here is a breakdown of key policy recommendations across various domains:

6.4.1. Disaster Risk Reduction (DRR) and Land Use

- Establish land use regulations that restrict development in high-risk flood zones. Encourage development in safer areas and prioritize environmentally friendly infrastructure projects such as urban parks or bioswales in floodplains.
- Implement stricter building codes that mandate flood-resistant construction techniques for new buildings in flood-prone areas. Additionally, implement financial assistance programs to help residents retrofit existing homes with flood-proofing measures.

6.4.2. Financial Resilience and Livelihood Security

- Enact policies that facilitate microfinance programs specifically designed for flood preparedness and mitigation measures. This could include low-interest loans for flood-resistant homes, emergency supplies, or starting flood-resilient businesses.
- Develop and support social safety net programs to provide financial assistance to low-income households affected by floods. This could include temporary housing support, food vouchers, or cash assistance for post-disaster recovery efforts.
- Initiate livelihood diversification by implementing policies that support and incentivize livelihood diversification programs. This could encourage residents to pursue income-generating opportunities outside of flood-prone sectors, thereby reducing their economic vulnerability to flood events.

6.4.3. Capacity Building and Institutional Collaboration

- Advocate for and support the Regional Disaster Management Agency (BPBD) to allocate resources and training to local DMAs (Disaster Management Authority) to enhance their capacity in disaster preparedness, response, and recovery efforts. This includes equipping them with the necessary technology, communication tools, and emergency response protocols.
- Develop policies that promote the creation of multi-stakeholder platforms or forums for DRR initiatives (F-DRR). These platforms should bring together government agencies, NGOs/KSBs, community leaders, and the public to facilitate collaboration, resource sharing, and knowledge exchange.
- Establish policies that mandate the creation and maintenance of a comprehensive knowledge management system to document best practices, lessons learned, and local knowledge related to flood risks. This information is invaluable for future planning and improving DRR strategies.

6.4.4. Community Empowerment and Public Awareness

- Develop policies that require a participatory approach to DRR planning and implementation. This includes involving residents in the decision-making process, vulnerability assessments, and monitoring and evaluation activities.
- Implement policies that encourage and allocate funds for public awareness campaigns about flood risks, preparedness measures, and evacuation procedures. These campaigns should use diverse and accessible communication methods, including local languages.

- Adopt policies that integrate DRR education into school curricula. This equips younger generations with the knowledge and skills needed to prepare for and effectively respond to floods.

6.4.5. Environmental Sustainability and Climate Change Adaptation

- Invest in improving waste management infrastructure and promoting waste reduction practices. This reduces the clogging of drainage systems, a significant factor in exacerbating flood risks.
- Develop policies that encourage the implementation of Sustainable Urban Drainage Systems (SUDS) such as rain gardens, permeable sidewalks, and bioswales. These systems can help manage stormwater runoff and reduce flood risks in urban environments.
- Integrate climate change adaptation strategies into DRR policies, considering the increasing frequency and intensity of extreme weather events such as floods. This includes long-term planning to manage sea-level rise and potential changes in rainfall patterns.

By adopting these policy recommendations, the four target urban villages can move beyond reactive measures and create a proactive approach to disaster risk reduction. These policies aim to foster a culture of preparedness, strengthen community resilience, and ensure a more sustainable future for all residents. Remember, policy development is an iterative process. Regular monitoring and evaluation with communities is essential to ensure that policies remain relevant, effective, and aligned with evolving needs and challenges.

7. Conclusions

The CLEAR program vulnerability assessment has identified several key factors that can affect the effectiveness and sustainability of the program. These factors can be categorized into three main domains:

1. Socioeconomic Context

- Poverty and economic inequality are major vulnerability factors for CLEAR program participants. This can limit their access to program services and their ability to utilize program benefits.
- Lack of access to education and information can hinder participants' involvement in the CLEAR program and their understanding of the program's goals and benefits.
- Reliance on the informal sector and unstable employment can make program participants vulnerable to economic changes and external shocks.

2. Institutional Capacity

- Weak institutional capacity at the local level can hinder the effective implementation of the CLEAR program. This may include lack of staff skills, inadequate resources, and poor coordination among stakeholders.
- Lack of program ownership by local communities can reduce the sustainability of the program after external interventions end.
- Unclear roles and responsibilities among stakeholders can lead to confusion and inefficiency in program implementation.

3. Environmental Factors

- Natural disaster risks, such as earthquakes, floods, and droughts, can disrupt CLEAR program implementation and endanger program participants.
- Climate change and environmental degradation can exacerbate existing vulnerability conditions and complicate the CLEAR program's efforts to build community resilience.
- Inadequate availability of basic infrastructure and services can limit participants' access to resources essential for their resilience.

In conclusion, the CLEAR program needs to consider these vulnerability factors in its design and implementation to ensure long-term success and sustainability. The program should focus on:

- Enhancing the economic and social capacity of program participants.
- Building institutional capacity at the local level.
- Increasing community resilience to natural disaster risks and climate change.

By addressing these vulnerability factors, the CLEAR program can deliver greater benefits to the most vulnerable communities and contribute to sustainable development in Indonesia.

8. Attachment

Glossary of Terms

References and Bibliography

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Project Team