

Community Engagement and Participation in Flood Disaster Mitigation: A Case Study of Sidenreng Rappang Regency, Indonesia

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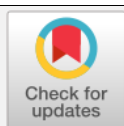
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ABSTRACT

This study evaluates community participation in flood disaster mitigation efforts in Wetee Village, Sidenreng Rappang Regency. Employing a descriptive qualitative approach, data were gathered through structured observations and in-depth interviews with community members and officials responsible for disaster management. The interview data were subsequently analyzed using NVivo 12 Plus software. The study focuses on community empowerment strategies implemented by the Sidenreng Rappang Regional Disaster Management Agency, using an eight-step community participation model to assess engagement levels. Findings reveal that the community's involvement in flood mitigation remains largely at a quasi-participation level, characterized by limited engagement in planning and supervisory processes. This restricted level of participation is seen to hinder the overall effectiveness of disaster mitigation initiatives. The study recommends promoting community participation from pseudo-participation to a 'delegated power' level to improve outcomes, facilitating comprehensive involvement in planning, execution, and oversight. These findings underscore the critical role of collaborative efforts across various stakeholders to enhance disaster preparedness and response capacities at the local level, ultimately fostering a more resilient community.

Keywords: Community Empowerment; Community Participation; Disaster Mitigation; Flood Management; Sidenreng Rappang Regency

1. Introduction

Indonesia, an archipelagic country along the equator, lies between Asia and Australia and the Pacific and Indian Oceans. Indonesia is highly vulnerable to natural disasters when positioned at the intersection of three major tectonic plates – the Eurasian, Indo-Australian, and Pacific plates.

Global climatic conditions significantly influence Indonesia's seasonal climate, resulting in variations that can lead to floods, droughts, and forest fires. A disaster is defined as an event or series of events that endanger and disrupt the lives and livelihoods of people, caused by natural, non-natural, or human factors, leading to casualties, environmental degradation, property damage, and psychological impacts (Hendra & Kismartini, 2018).

Sidenreng Rappang Regency, located in South Sulawesi Province, is one of Indonesia's disaster-prone areas, particularly vulnerable to natural disasters such as floods. Flooding is a recurring natural phenomenon that causes significant losses and poses an ongoing threat to several areas within the Sidenreng Rappang Regency.

The Sidrap Regency Government has sought to involve the community in disaster management efforts by establishing the Regional Disaster Management Agency (Badan Penanggulangan Bencana Daerah or BPBD). This agency acts as an extension of the local government in managing disasters, founded based on Sidenreng Rappang Regional Government Regulation Number 5 of 2013, which defines the Organizational Structure and Work Procedure of the Sidenreng Rappang BPBD.

The establishment of BPBD in Sidenreng Rappang Regency aims to fulfill four key functions related to disaster management. One of these functions is to foster active collaboration with stakeholders through program partnerships, including encouraging community cooperation in mitigating natural disasters, particularly floods. Community participation in disaster mitigation is essential, as it fosters a sense of ownership and engagement among residents by participating in planning, implementing, and evaluating development activities (M. S. S. Ali et al., 2019; Pujiningrum Palimbunga, 2018).

Despite efforts by local authorities to promote community involvement through BPBD and collaborative programs, community participation in disaster mitigation in Sidenreng Rappang remains low. Limited community awareness and involvement in disaster mitigation planning, implementation, and monitoring phases reduce the effectiveness of disaster management initiatives in the region. This situation highlights the need for a closer examination of the level of community participation and the obstacles hindering their engagement in disaster mitigation.

This research aims to analyze community involvement in flood disaster mitigation in Wetee Village, Sidenreng Rappang Regency, and identify the factors that limit this involvement. The findings are expected to provide policy recommendations to support comprehensive community participation in disaster mitigation efforts. Community engagement is critical given the numerous natural disasters throughout 2021 in Sidrap Regency, as shown in Table 1.

Table 1. Data on the Number of Natural Disasters in Sidrap Regency in 2021

No.	Natural Disasters	Disaster Incidents and Impact	Locations Affected
1	Flood	Four incidents impacted 466 households and 5,785 individuals	Dua Pitue, Panca Lautang, Maritengngae
2	Extreme Weather and	19 incidents impacted 210	Dua Pitue, Pitu Riawa

No.	Natural Disasters	Disaster Incidents and Impact	Locations Affected
	Strong Winds	households and 745 individuals	
3	Building and Residential Fires	20 incidents impacted 31 households and 108 individuals	Dua Pitue, Pitu Riawa, Pitu Riase, Watang Sidenreng, Maritengngae, Panca Rijang, Kulo, Tellu Limpoe
4	Landslide	One incident; no casualties were reported	Pitu Riawa
5	Earthquake	One incident; no casualties were reported	Dua Pitue
6	Hazards to Humans	Three incidents; 7 fatalities due to drowning	Pitu Riawa, Pitu Riase, Panca Rijang

Source: Sidenreng Rappang Regency BPBD Profile 2021

Based on these facts, disaster preparedness is crucial. As the rainy season approaches, the BPBD of Sidenreng Rappang Regency actively monitors flood-prone areas, focusing on four locations susceptible to flooding during heavy rains. According to the Head of BPBD, three sub-districts—Dua Pitue, Panca Lautang, and Maritengngae—are at particular risk of flooding. Additionally, many residents, especially in Wette'e, Panca Lautang sub-district, have built houses near rivers, indicating a lack of community awareness and preparedness regarding potential disaster risks.

2. Literature Review

2.1. Community Participation in Disaster Management

Since 2000, researchers have extensively examined community-based disaster risk management to reduce community vulnerability, develop disaster mitigation strategies grounded in local characteristics and wisdom, and enhance community resilience and recovery in disaster situations (Gero et al., 2011). Disasters significantly impact various aspects of social well-being (Imperiale & Vanclay, 2021). A bottom-up approach to disaster prevention and mitigation can improve disaster response systems, enhance public understanding of disaster risks, strengthen overall prevention and mitigation capabilities, and reduce disaster-related losses (Que et al., 2022).

As the fundamental social unit, communities have a natural relationship with disaster response, encompassing disaster management and post-disaster recovery (Li & Tan, 2019). This dynamic highlights the need for active community involvement before and after disasters. Participation involves engaging community members in identifying issues and decision-making processes for problem-solving. Building community engagement helps raise awareness and fosters a proactive mindset.

In her article “A Ladder of Citizen Participation,” published in the Journal of the American Institute of Planners, Sherry Arnstein proposed eight levels of community participation (Arnstein, 1969; Gaber, 2019).

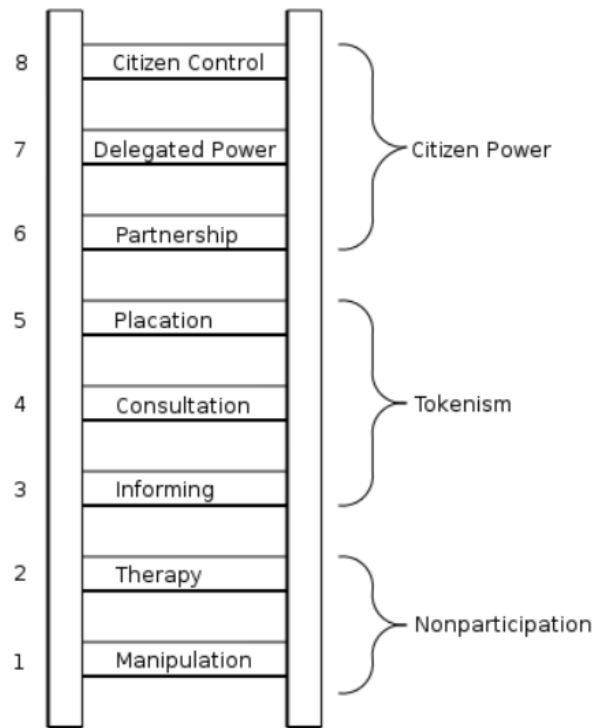


Figure 1. Eight Rungs on The Ladder of Citizen Participation
Source: (Arnstein, 1969)

Arnstein's model describes the progression of citizen participation from tokenistic measures to full empowerment or community control. The ladder metaphor illustrates a hierarchy, suggesting that lower ladder levels represent less equitable or ethical participation than higher rungs. This hierarchical approach has led to numerous reinterpretations of the model (White & Langenheim, 2021).

At the top of Arnstein's ladder is "citizen control," representing a shift in power to communities traditionally excluded from political and economic processes, thereby providing avenues for meaningful citizen participation in social reform (Bull & Janda, 2018). Arnstein's framework serves as a valuable tool for understanding flood resilience through participatory planning, which is particularly relevant since disaster mitigation and infrastructure planning often involve lower levels of community engagement than other planning activities (Berke et al., 2015).

Arnstein's model classifies citizen participation across eight levels within three primary domains: non-participation, tokenism, and citizen power. The first two rungs signify non-participation, while the third and fourth represent tokenism, allowing participants to share their views without genuine influence (White & Langenheim, 2021).

Table 2. Levels of Community Participation According to Arnstein's Ladder of Citizen Participation

Level	Participation Type	Category
8	Citizen Control	Degree of Citizen Power
7	Delegated Power	Degree of Citizen Power
6	Partnership	Degree of Citizen Power

Level	Participation Type	Category
5	Placation	Tokenism
4	Consultation	Tokenism
3	Information	Tokenism
2	Therapy	Non-Participation
1	Manipulation	Non-Participation

Source: ([Arnstein, 1969](#))

Based on Arnstein's framework, this study analyses community participation in flood disaster management in Wetee Village, Sidenreng Rappang, using Arnstein's ladder as an evaluative indicator.

2.2. Disaster Mitigation

Enhancing public engagement in hazard mitigation planning and integrating hazard mitigation with broader community planning is essential for achieving community resilience, equitable risk assessment, and public support for mitigation efforts ([Hendricks et al., 2022](#)).

According to Indonesia's Law No. 24 of 2007 and Government Regulation No. 21 of 2008, disaster mitigation refers to efforts to minimize disaster impacts. Mitigation encompasses actions to reduce disaster risks, including physical development and strengthening public awareness and preparedness. The enactment of Law No. 24 of 2007 on Disaster Management marked a paradigm shift from reactive emergency responses to proactive disaster prevention strategies. Subsequent initiatives include Disaster Risk Reduction (DRR) policies focused on capacity-building in the pre-disaster phase. Through the National Disaster Management Agency (Badan Nasional Penanggulangan Bencana, BNPB), the government has developed systems and strategies that include community-based approaches to disaster risk management. One such initiative is the Desa Tangguh Bencana (Resilient Village) program, established under BNPB Regulation No. 1 of 2012 ([Supratiwi et al., 2022](#)).

Disasters are a part of human existence, and disaster management paradigms generally fall into two categories: creating disaster-free environments or promoting coexistence with potential disasters. The primary objective of community-based disaster management in Indonesia and other countries is to enhance local disaster preparedness and response capacity, acknowledging the limitations of governmental resources, including human, financial, equipment, and logistical support. Effective disaster management, therefore, requires collaboration among all stakeholders: government bodies, private entities, and community members. Each stakeholder plays a crucial role, as disaster preparedness relies on contributions from all parties beyond individual interests ([M. S. S. Ali et al., 2019](#)).

Crisis preparedness involves thorough planning and preparation to ensure a robust response to disaster events. This includes capacity-building, coordinating relevant organizations, mobilizing individuals and volunteers, and ensuring adequate resources and training to handle disaster situations effectively ([Koenti, 2022](#)).

3. Research Methodology

This study employed a descriptive qualitative method to assess community involvement in flood disaster mitigation in Wetee Village, Sidenreng Rappang Regency. This method was chosen to explore how community members perceive, experience, and participate in a complex social setting. Data was collected through in-depth interviews and observational studies.

Interviews were conducted with local community members and officials from the Regional Disaster Management Agency (BPBD) involved in disaster mitigation efforts. The interview questions focused on the factors facilitating or hindering community participation in these activities. Participatory observations were also conducted to examine flood-prone villages' physical and social conditions.

Additional data was gathered from government documents, BPBD reports, and academic literature. A purposive sampling technique was used to select study participants, targeting informants living in flood-prone areas with disaster preparedness experience. The sample also included individuals actively involved in disaster management activities. Participants from diverse ages and socio-economic backgrounds were chosen to capture various perspectives.

The collected data was analyzed using NVivo 12 Plus software, applying thematic analysis grounded in Sherry Arnstein's theoretical framework, "A Ladder of Citizen Participation" (Arnstein, 1969). This framework categorizes community participation into eight levels, ranging from "non-participation" to "citizen power." The analysis provides insights into the extent of community engagement in flood disaster mitigation in Wete'e Village and the factors influencing their involvement. The findings aim to offer recommendations for enhancing community participation in disaster preparedness.

4. Results and Discussion

Wete'e Village is a flat and gently sloping area, approximately 1 meter above the lake water level. Hydrologically, Wete'e has two rivers: Wete'e 1/Tampu Buaya, about 1-5 meters from settlements in the Orai Salo neighborhood. These rivers function as natural channels that carry water flow. Lake Tempe, which connects to these rivers and has a narrow cross-section, lacks embankments along its banks, significantly contributing to flooding.

Like other lakeside areas, Wete'e Village has a moderately high flood risk. Flooding is often caused by high rainfall, sedimentation, and runoff that exceeds the capacity of rivers and Lake Tempe. Areas bordering the lake and rivers, where sedimentation frequently occurs, are particularly susceptible. Flooding adversely impacts the development of Wete'e Village, affecting economic activities, transportation, and social well-being.

This study applies Arnstein's "Ladder of Citizen Participation" theory (Arnstein, 1969) to assess community involvement in flood management in Wete'e Village. Community participation fosters a sense of ownership and enthusiasm for development activities rooted in engagement across planning, implementation, and evaluation phases.

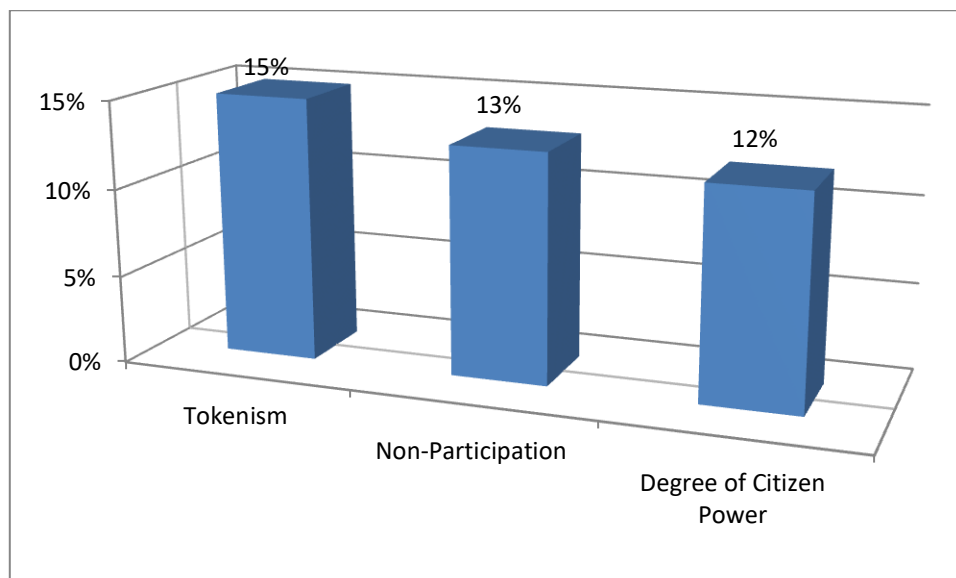


Figure 2. Coding Matrix of Interview Results

The results indicate that community participation in flood disaster management in Wette'e Village is still low. Interviews with residents reveal minimal public awareness of flood impacts, with some viewing floods as an economic opportunity rather than recognizing the broader health and livelihood risks. The community's lack of proactive flood management is evident, as residents acknowledge the dangers but view flooding as a natural condition to adapt to rather than prevent. For example, some residents respond to flooding by fishing, considering it a blessing rather than a risk.

Community participation aligns with the second rung of Arnstein's ladder—tokenism or “apparent participation”—which does not achieve the inclusive vision of genuine community involvement. Tokenism in Arnstein's model is divided into three sublevels: data transfer, consultation, and reassurance. The following table presents community participation levels by category in Wette'e Village.

Table 3. Level of Community Participation by Category

Participation Category	Percentage (%)
Non-Participation	30%
Tokenism - Data Sharing	25%
Tokenism - Consultation	20%
Tokenism - Reassurance	15%
Delegated Power	5%
Citizen Control	5%

Table 3 shows that most community involvement falls under non-participation and tokenism, reflecting limited engagement in disaster mitigation. This finding is consistent with research by Hendra and Kismartini in Sumbawa Regency (Hendra & Kismartini, 2018), where community involvement in flood mitigation was minimal, largely symbolic, and without substantial influence on policy. Similarly, research in Bangladesh (I. Ali et al., 2016). found limited community engagement in disaster mitigation, where initial awareness efforts were conducted but with no real power granted to influence planning and implementation.

Arnstein's framework suggests that while citizens can voice their opinions, the government ultimately retains decision-making power with no guarantee of implementing community suggestions. Tokenism's three sublevels—data transfer, consultation, and reassurance—allow citizens to express desires and receive government feedback without assurances of action.

The "tokenism" levels (data transfer, consultation, and reassurance) fall within the middle rungs of Arnstein's ladder, where community input is acknowledged but lacks the power to influence policy. According to Arnstein, limiting participation at this level makes significant positive change unlikely.

Interviews reveal that information provided to the community about disaster mitigation is largely one-way. During meetings, BPBD listens to community feedback, criticisms, and suggestions. However, although community aspirations are recorded, these inputs are not guaranteed to be implemented. This approach suggests that decision-making for planning and future-focused actions remains in the government's control (Petts, 2001).

According to Arnstein, the appeasement strategy involves allowing the public to make proposals or provide input, but ultimately, decision-making rests with those in power. Community members often feel their suggestions are ignored or unfulfilled.

Effective participation should enable the community to be actively involved in identifying problems, proposing solutions, and influencing decision-making. This requires a two-way engagement process, where community views inform decisions, and there is a dialogue with experts and decision-makers. This approach fosters genuine collaboration (Bull & Janda, 2018).

Arnstein argues that real decision-making power emerges when participants gain control over both the process and outcomes. Although the ladder framework is imperfect, it illustrates how participants can gain influence and control based on their level of engagement.

Community participation should encompass the implementation of activities and the planning and development of disaster management strategies in Sidenreng Rappang Regency, especially in Wette'e Village. Effective participation includes voluntary involvement from individuals or groups in planning, executing, and further developing disaster-related activities.

The top rung of Arnstein's ladder, "citizen power," represents community engagement, where partnerships and delegation of authority allow communities to make substantive contributions. However, in Wette'e Village, this level of participation is still lacking. While there is some partnership between the community and BPBD in developing disaster threat maps, it is limited to creating maps without proactive flood anticipation.

In Wette'e Village, Panca Lautang sub-district, residents receive training in developing disaster hazard maps and standard operating procedures (SOPs). Before creating a disaster risk map, BPBD provides an example and guide for map development during community outreach events. The community is expected to create safe public spaces, and the government hopes residents will gain disaster knowledge, as Wette'e is a high-risk area.

The community can implement learned disaster empowerment programs at the delegated power level. However, these programs are not yet fully utilized. Interviews reveal that while community communication and understanding of disaster risks have improved through training, engagement is initially limited. However, community participation increases by the second day of training, with a more active involvement rate of approximately 50-60%, thanks partly to community support.

5. Conclusion

Community participation in flood disaster management in Wettee Village, Sidenreng Rappang Regency, remains at a level of pseudo-participation, indicating limited public

awareness and engagement in addressing flood risks. Community involvement is primarily consultative, lacking real influence on decision-making processes. Although the community generally understands flood risks, their role and capacity in disaster mitigation remain underdeveloped. This low level of engagement may hinder the effectiveness of mitigation programs implemented by the Regional Disaster Management Agency (BPBD).

Given these findings, the government must actively involve the community in planning and implementing flood management initiatives in Wetee Village. Increasing community participation can help address the recurring flood challenges. Local authorities should establish regulations encouraging greater community involvement and reinforce this through targeted education and training programs. BPBD and local governments should organize continuous educational programs focused on disaster mitigation to enhance community awareness and capacity.

Policies that delegate certain responsibilities to the community can foster a sense of ownership and strengthen their engagement in disaster response. This can be achieved by forming working groups or committees that involve residents in mitigation planning. Collaborating with NGOs, schools, and businesses can provide communities with essential resources—such as funding, expertise, and technology—to support sustainable disaster reduction programs.

Creating a structured feedback system allows the government to understand the community's needs and priorities when formulating policies. This ensures that mitigation programs are relevant and responsive to current conditions. These steps are crucial for building a collaborative, resilient flood control strategy where the community is empowered and integral in disaster management efforts.

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7. Declaration of Conflicting Interests

The authors have declared no potential conflicts of interest concerning this article's research, authorship, and/or publication.

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