



## Analysis of Disaster Survivors' Perceptions Regarding Disaster Preparedness in Tondo Housing

Rasyika Nurul Fadrijah<sup>1\*</sup>, Arwan<sup>2</sup>, Firmansyah<sup>3</sup>, Sendhy Krisnasari<sup>4</sup>, Khaerunisa<sup>5</sup>

<sup>1</sup>Ilmu Kesehatan Masyarakat, Universitas Tadulako, [rasyikanururfadrijah](mailto:rasyikanururfadrijah)

<sup>2</sup>Ilmu Kesehatan Masyarakat, Universitas Tadulako, [arwan\\_arifin@yahoo.co.id](mailto:arwan_arifin@yahoo.co.id)

<sup>3</sup>Ilmu Kesehatan Masyarakat, Universitas Tadulako, [Firmansyahwantah15@gmail.com](mailto:Firmansyahwantah15@gmail.com)

<sup>4</sup>Ilmu Kesehatan Masyarakat, Universitas Tadulako, [evamulyanis295@gmail.com](mailto:evamulyanis295@gmail.com)

<sup>5</sup>Ilmu Kesehatan Masyarakat, Universitas Tadulako, [lkhairunnisaa2@gmail.com](mailto:lkhairunnisaa2@gmail.com)

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### ABSTRACT

This study aims to analyze disaster survivors' perceptions of disaster preparedness in the Permanent Housing (Huntap) area of Tondo, Palu City. Huntap Tondo serves as a relocation site for victims of the 2018 earthquake, tsunami, and liquefaction disasters. Although survivors now reside in a newly developed area designed to enhance safety and comfort, they continue to face potential future disaster risks. Employing a qualitative case study approach, data were collected through in-depth interviews, field observations, and documentation involving 15 key informants, including survivors and community leaders. The findings reveal that survivors' perceptions of disaster preparedness are strongly influenced by their traumatic experiences, level of understanding of disaster risks, and the availability of disaster information and education within their environment. While some survivors demonstrated high awareness of the importance of preparedness—such as storing emergency supplies and participating in disaster training—others exhibited more passive attitudes, relying predominantly on authorities. Limited community involvement in mitigation planning and insufficient routine socialization were identified as major obstacles to fostering collective preparedness. This study recommends a more participatory, community-based approach alongside strengthening local capacity through ongoing training and the establishment of accessible disaster information systems for all residents of Huntap Tondo.

### Corresponding Author:

Rasyika Nurul Fadrijah  
Ilmu Kesehatan Masyarakat, Universitas Tadulako  
[rasyikanururfadrijah](mailto:rasyikanururfadrijah)

## INTRODUCTION

The Constitution of the Republic of Indonesia (UUD 1945) mandates the state to protect all citizens and the entire territory of Indonesia, including safeguarding against disaster threats. This commitment is reflected in national development policies, where disaster risk reduction is integrated into the National Medium-Term Development Plan (RPJMN) 2020–2024 and is systematically planned within the Long-Term Development Plan (RPJPN) 2025–2045. The Indonesian government has also prioritized disaster resilience as a key component of its sustainable development agenda (Bappenas, 2023).

Geographically, Indonesia is situated at the convergence of three active tectonic plates and is heavily influenced by tropical climatic conditions, making it highly susceptible to natural disasters such as earthquakes, tsunamis, volcanic eruptions, floods, and droughts. This has earned the country the nickname “disaster supermarket.” Nevertheless, significant progress has been made in institutional strengthening, monitoring technology, and early warning systems over recent years, although substantial challenges remain, especially in remote and under-resourced regions (BNPB, 2022).

One major disaster that highlights the complex nature of these risks occurred on September 28, 2018, when a magnitude 7.4 earthquake struck Central Sulawesi, triggering a tsunami and massive liquefaction in

the areas of Palu, Sigi, and Donggala. According to the Ministry of Energy and Mineral Resources (ESDM), tsunami waves reached heights of over 11 meters in certain locations. The National Disaster Management Agency (BNPB) reported economic losses exceeding IDR 18 trillion, with over 4,300 people dead or missing and more than 170,000 displaced (BNPB, 2019; ESDM, 2024).

The earthquake was caused by the movement of the Palu-Koro Fault, an active strike-slip fault extending from the Sulawesi Sea to the Gulf of Bone. This fault lies at the intersection of the Indo-Australian, Eurasian, and Philippine Sea tectonic plates. Recent geological studies by the Geological Agency have identified four active segments of the Palu-Koro Fault (Makassar, Saluki, Palu, and Moa), marking it as one of the most seismically hazardous faults in Indonesia (Badan Geologi, 2024).

In addition to the tsunami, the earthquake triggered severe liquefaction events that submerged entire settlements in Petobo, Balaroa, Jono Oge, and South Sibalaya. These phenomena underscore the urgent need for geological risk-based mitigation and adaptive spatial planning that considers subsurface hazards.

Vulnerability to disasters in Indonesia is influenced not only by physical or geological factors but also by social, economic, and institutional conditions. National disaster risk index assessments reveal that communities with low educational attainment, high economic dependency, and limited access to public services are more prone to disaster impacts (BNPB & UNDP, 2022). Therefore, effective disaster risk reduction must be supported by inclusive development strategies that strengthen local capacities, enhance social capital, and promote community-based resource management.

## RESEARCH METHODS

This study employed a qualitative research design, which aims to describe and analyze phenomena, events, social activities, attitudes, beliefs, and human perceptions—both individually and in groups (Ghony, 2012). The research adopted a case study approach, which allows for an in-depth and comprehensive examination of a specific subject or object of inquiry.

The selection of informants was conducted using a snowball sampling technique, commonly used in qualitative research to gather rich and relevant information. Informants in this study were categorized into two groups: key informants, consisting of community leaders who possess crucial information related to the research focus, and general informants, which include community members residing in the Tondo Permanent Housing (Hunian Tetap Tondo) area and who are directly involved in the social context being studied.

Qualitative data were analyzed using content analysis, a method used to systematically interpret and organize textual data into meaningful categories (Herdiansyah, 2013). The analytical process included transcription of interview data, data reduction, interpretive analysis, and synthesis. Based on the transcriptions, the data were further examined and interpreted to generate thematic conclusions that were then presented in narrative form.

## RESULTS AND DISCUSSION

### Perceived Severity

The findings of this study indicate that community perceptions of disaster severity are closely tied to individual beliefs regarding the seriousness of potential threats, particularly those that may occur within the permanent resettlement area (Huntap). The majority of informants identified flooding as the most frequent and concerning disaster. These floods are typically triggered by heavy rainfall and exacerbated by inadequate infrastructure, especially poorly designed drainage systems. In several blocks, stagnant water carried mud and sediment into residents' homes, resulting in prolonged and difficult cleanup efforts. Informants reported that intense rainfall in recent months led to muddy floods in specific areas, such as Block X, where the hardened mud required special handling.

In addition to flooding, strong winds were also cited as a recurrent hazard, particularly during nighttime storms, increasing residents' anxiety about their safety and comfort in the resettlement area. Although landslides have not yet occurred, some informants expressed concern due to the site's proximity to hilly or mountainous terrain. Nevertheless, prior soil stability assessments indicated that the area has relatively stable geological conditions, suggesting a low risk of landslides.

Flooding, however, is perceived as a particularly serious threat, especially given previous incidents that nearly resulted in casualties—such as children being swept away by floodwaters but narrowly rescued. These experiences have reinforced community perceptions that flooding poses a significant and immediate risk requiring serious mitigation.

One of the primary causes of recurrent flooding in the settlement is the suboptimal drainage system, which was not adequately planned during construction. The disorganized management of water flow has led to rainwater overflowing into residential areas, lacking sufficient runoff channels. While other disasters—such as earthquakes and liquefaction—were not perceived as immediate threats within the settlement, despite its proximity to the 2018 disaster zone, the perception of disaster severity remains largely shaped by the

community's lived experiences, available infrastructure, and the responsiveness of local authorities and community networks in previous disaster events.

### **Perceived Susceptibility**

Based on in-depth interviews, it was found that most informants demonstrated a high level of perceived susceptibility to potential disasters in the permanent resettlement area. This perception reflects individuals' beliefs regarding the likelihood of being affected by a disaster, which directly influences their preparedness and tendency to engage in preventive actions. Informants highlighted that the area's geographical conditions and incomplete infrastructure—particularly the unfinished drainage systems in several zones—were the main factors contributing to their vulnerability to flooding. This was evidenced by past incidents where prolonged rainfall caused muddy runoff to enter residents' homes, especially in Block X. These experiences reinforced the community's view that the area remains highly prone to flooding, particularly during periods of intense rainfall.

In addition to floods, residents also expressed concern about the risks posed by strong winds, which frequently occur during the rainy season. A common fear was the danger of falling branches or tree limbs that could unexpectedly strike rooftops. Although such incidents may not be large in scale, they are perceived as recurring threats that heighten the community's sense of vulnerability. Overall, the high level of perceived susceptibility underscores the need for improved risk mitigation and environmental adaptation efforts, enabling residents to adopt more responsive behaviors toward the disaster risks in their surroundings.

### **Perceived Benefits**

Findings from in-depth interviews indicate that residents of the permanent resettlement area have developed various forms of preventive behavior in response to the potential disaster risks in their environment. Their perception of the benefits of such preventive actions motivates active community participation in mitigation efforts, including the development of basic infrastructure and collective activities. A notable example is the construction of a large drainage channel at the upper section of the settlement, initiated in response to previous flooding events. This project was carried out through coordination between residents and management authorities and is believed to significantly reduce the risk of future flooding.

In addition, residents regularly engage in communal work (locally known as *kerja bakti*) every weekend to clean drainage channels and surrounding areas to prevent clogging that could worsen waterlogging during heavy rains. Other preventive measures include trimming or cutting down tree branches to reduce the risk of damage caused by strong winds. These efforts are seen as essential, especially since some houses are located in areas prone to falling branches during extreme weather.

Local government involvement has also played a supportive role. For instance, the municipal fire department has assisted in cleaning up residual mud and debris after floods. Village officials have been involved in identifying water flow paths and addressing flood-prone points as part of anticipatory actions.

Regarding building structures, most informants perceived the permanent houses as relatively strong and earthquake-resistant, thus capable of minimizing physical damage during disasters. However, opinions among residents varied. Some expressed concerns about the structural resilience of the buildings, especially due to the use of materials such as lightweight steel and calcium silicate boards, which were perceived as less robust compared to reinforced concrete. There were also concerns about the vulnerability of ceiling structures, although no major incidents had been reported thus far. Nevertheless, the buildings were generally considered safe against strong winds, offering sufficient protection from falling branches and causing no significant damage beyond noise disturbance.

Overall, these findings highlight a growing awareness and collective action among the community in responding to disaster risks, whether through behavioral adaptation, infrastructure improvements, or collaboration with local authorities. However, perceptions regarding the effectiveness and safety of the resettlement housing remain varied, indicating the need for improved risk communication and ongoing technical assessments of both buildings and their surrounding environment.

### **Perceived Barriers**

The findings of this study reveal that one of the primary barriers perceived by residents in adopting preventive behaviors is the limited access to clean water, which is an essential component of basic sanitation. This issue is particularly significant given that access to clean water is critical for maintaining personal and environmental hygiene, which directly influences disaster preparedness—especially in preventing flood-related health risks and waterborne diseases.

According to several informants, the supply of clean water in the permanent resettlement area (hunting) remains dependent on the municipal water utility (PDAM), whose capacity is reportedly insufficient to meet the needs of approximately 1,500 households simultaneously. As a result, the management has implemented a

rotating water distribution schedule, whereby water is supplied to each block only once or twice a week according to a predetermined timetable.

This situation directly impacts residents' daily lives, forcing them to conserve water due to the limited and inconsistent supply. Informants acknowledged the vital role of water in essential daily activities such as bathing, cooking, and cleaning. However, the irregular access poses a serious challenge in maintaining adequate sanitation standards. In response, some residents have initiated private groundwater drilling efforts to reduce their reliance on the PDAM supply. While this adaptation reflects a proactive response to structural barriers, it also highlights a significant gap in the provision of basic services by responsible authorities.

If not addressed promptly, the clean water access barrier could hinder the effectiveness of broader disaster mitigation strategies and compromise overall public health resilience in the community.

### Cues to Action

Findings from in-depth interviews reveal that *cues to action*—internal and external factors that prompt individuals or groups to take concrete steps in response to threats—play a critical role in shaping disaster preparedness behaviors among residents of the Huntap Tondo community. These cues manifest in various forms, including personal experiences with past disasters, social influence, and information disseminated by authorities.

Traumatic experiences from the 2018 earthquake, tsunami, and liquefaction events serve as a major catalyst for heightened awareness among residents regarding potential future disasters in their new settlement. Memories of the catastrophe continue to influence their vigilance, particularly in observing environmental signs such as heavy rainfall, strong winds, and ground tremors.

Social communication from community leaders—such as neighborhood heads, village officials, and religious figures—also functions as a significant trigger for preventive action. For instance, public advisories to clear drainage systems during the rainy season, early warnings from the Meteorological, Climatological, and Geophysical Agency (BMKG), and disaster education provided by the local Disaster Management Agency (BPBD) have encouraged residents to prepare emergency supplies or avoid flood-prone areas.

Peer-to-peer interactions further reinforce these cues. When one resident takes proactive measures—such as storing clean water, moving valuables to safer locations, or sharing weather updates—others often follow suit. Community clean-up initiatives during the rainy season exemplify collective action arising from shared awareness of flood risks.

Nonetheless, a portion of the population remains less responsive due to limited access to information or a lack of direct disaster experience in the new location. Therefore, strengthening *cues to action* requires sustained efforts in disaster education, accessible early warning systems, and increased community participation in preparedness drills and response simulations.

With more robust triggers for action at both individual and community levels, disaster preparedness among Huntap Tondo residents is expected to improve, enhancing their resilience to future hazards.

### CONCLUSION

The findings of this study indicate that the majority of disaster survivors residing in the permanent housing area (Huntap) continue to perceive themselves as highly susceptible to disaster risks, particularly flooding and strong winds. This perceived susceptibility is largely shaped by past traumatic experiences that have left lasting concerns. Residents also perceive the severity of disasters—such as the previous flood accompanied by mudflow that nearly caused casualties—as a serious threat to both safety and public health.

This heightened awareness reinforces the perceived benefits of preparedness actions, such as improving drainage systems, preparing emergency supplies, and complying with official recommendations as effective preventive measures. Nevertheless, several perceived barriers hinder community preparedness efforts. These include inadequate infrastructure—especially unfinished drainage systems—and the lack of consistent disaster education and training.

Despite these challenges, various cues to action, including weather alerts, past disaster experiences, and encouragement from community leaders and the media, have motivated residents to be more proactive in disaster preparedness. Moreover, communal cooperation and interpersonal communication among residents have played a crucial role in fostering collective action to address disaster risks.

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