

ANALYSIS OF GOVERNMENT AND COMMUNITY PREPAREDNESS IN TERBOYO INDUSTRIAL AREA, GENUK DISTRICT FACING FLOODS

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Abstract

Terboyo Industrial Area, Genuk District, Semarang City faces recurrent flooding due to extreme rainfall, land subsidence, and poor drainage, disrupting industrial operations and community livelihoods. This study analyzes government and community preparedness levels, examining synergy between Disaster Preparedness Forums and infrastructure responses. Employing a qualitative descriptive approach, purposive sampling targeted 12 key informants from BPBD, subdistrict officials, and community leaders across 10 flood-prone villages. Data collection utilized semi-structured interviews, participant observation, and BPBD document analysis, with Miles and Huberman's model for thematic coding, data display, and triangulation ensuring credibility. Findings reveal government initiatives including portable pumps, color-coded flood mapping, and emergency facilities, alongside community efforts in evacuation planning and environmental maintenance. However, disaster literacy gaps and coordination weaknesses persist. Conclusions emphasize government-community synergy through enhanced education, real-time early warning systems, and FSB capacity building for sustainable resilience.

Keywords: Community Preparedness, Disaster Management, Flood Mitigation, Government Synergy, Terboyo Industrial Area.

INTRODUCTION

Indonesia ranks among the most disaster-prone nations globally due to its position on the Pacific Ring of Fire and equatorial climate, experiencing frequent hydrometeorological events like floods exacerbated by extreme rainfall and El Niño phenomena [Hendrawan et al., 2025; BNBP, 2025]. Semarang City, particularly the Terboyo Industrial Area in Genuk District, faces recurrent flooding from tidal surges, land subsidence rates of 10-20 cm annually, and inadequate drainage systems near coastal lowlands, disrupting economic activities, terminal operations, and community mobility [Syahputri & Husein, 2023; Saputri et al., 2023]. Flood events in February 2025 reached 65 cm around Sultan Agung Hospital and Terboyo Terminal, highlighting vulnerability in sloping terrain prone to water accumulation [Taufiq et al., 2024; Semarang et al., 2025].

The Terboyo area's strategic industrial significance amplifies flood impacts on regional supply chains and livelihoods, with BPBD data confirming Genuk as the most affected district impacting 10 villages and 6,700 households [BPBD, 2025]. Environmental degradation from groundwater overexploitation contributes 74% to subsidence, compounding infrastructure burdens in densely populated zones [Iskandar et al., 2025]. These patterns underscore Terboyo's chronic exposure to seasonal flooding that transforms routine operations into emergencies.

Despite annual occurrences, community preparedness remains inadequate, evidenced by limited mitigation knowledge, poor evacuation infrastructure, and weak inter-agency coordination during crises [Intani Syahputri & Husein, 2023; Utami et al., 2021]. Residents

exhibit low disaster literacy, relying on ad-hoc responses rather than structured plans, while government measures like portable pumps and public kitchens often fail to cover all affected zones comprehensively [Gustini et al., 2021; Lestari et al., 2024]. Coordination gaps between BPBD, Public Works, and local forums hinder timely responses.

Flooding's socioeconomic toll in Terboyo demands urgent attention, as infrastructure deficits and behavioral gaps elevate risks beyond technical capacity [Elsa Frizani et al., 2021; Faisal & Kamal, 2024]. Persistent land subsidence and tidal influences create complex challenges requiring integrated governance beyond reactive aid distribution.

This study aims to analyze government and community preparedness levels in Terboyo Industrial Area facing floods, examining synergy effectiveness between Disaster Preparedness Forums, infrastructure responses, and local mitigation practices. Its urgency lies in addressing Semarang's escalating flood frequency amid climate change, supporting sustainable development goals through enhanced resilience. The novelty emerges from contextualizing BPBD 2025 flood data with stakeholder interviews in this understudied industrial-coastal interface, offering actionable policy insights absent in prior village-centric analyses [Alhadi & Ilham, 2025; Cintya Febrianti Nuraini & Abdul Rahman, 2025].

METHOD

This study employs a qualitative approach with descriptive design to comprehensively examine government and community preparedness in the Terboyo Industrial Area, Genuk Subdistrict, facing recurrent floods, consistent with natural settings without variable manipulation [Sugiyono, 2022; Creswell & Poth, 2021; Rijal Fadli, 2021]. This approach effectively uncovers complex social phenomena through contextual and interpretive analysis, emphasizing participant perspectives on flood dynamics in industrial-coastal zones [Sari et al., 2024; Dr. Gandi Wibowo et al., 2024]. Conducted in Terboyo's authentic environment, research follows an inductive orientation from field data toward theoretical generalization.

Data collection instruments and techniques comprise semi-structured in-depth interviews with community leaders, flood-affected residents, and relevant government officials, complemented by participant observation of Disaster Preparedness Forum (FSB) activities and secondary documentation including BPBD reports, flood vulnerability maps, and evacuation records [Basiroen et al., 2025; Emzir, 2022]. Data analysis follows Miles and Huberman's model through data reduction (thematic coding), data display (matrices and narratives), and conclusion verification using source triangulation (multi-informant) and method triangulation (interviews-documentation) to ensure finding credibility [Sudaryono, 2021].

The research population encompasses all Terboyo Industrial Area stakeholders including Genuk subdistrict government, Semarang City BPBD, community leaders, and flood-affected residents across 10 vulnerable villages (Banjardowo, Trimulyo, Terboyo Kulon, etc.), with purposive sampling of 12 key informants selected based on direct flood response involvement [Sugiyono, 2022; Creswell & Poth, 2021]. The sample includes BPBD

head, Genuk subdistrict head, FSB chairman, and community evacuation representatives following qualitative information saturation principles.

Research procedures commence with preliminary literature review and field reconnaissance for informant identification, followed by two-month primary data collection through repeated interviews, direct flood response observation, and BPBD document compilation, then iterative analysis with member checking for validation, and final findings formulation [Emzir, 2022; Sudaryono, 2021]. The entire process adheres to research ethics through informed consent, informant anonymity, and official data access approval [Sari et al., 2024].

RESULTS AND DISCUSSION

According to (Zuliani and Sufendi Hariyanto 2021), preparedness is part of the disaster management process and, within this concept, the current development of disasters and the importance of preparedness are key elements of proactive disaster prevention or risk reduction activities that take place before a disaster occurs. Preparedness can also be defined as a series of activities carried out to anticipate disasters through organization and appropriate and effective measures (Law No. 24, 2007). Preparedness aims to minimize the negative impacts of potential hazards through the implementation of effective precautionary measures, while ensuring that emergency responses can be implemented in a timely, accurate, and efficient manner. Preparedness should be understood as an active and ongoing process, requiring careful planning and strategy (Umam Khoirul et al., 2025). The government has policies and responsibilities for flood mitigation efforts. In this context, the government is required to have adequate capacity to manage conditions in disaster-prone areas. This capacity includes disaster management planning and preparedness, aid coordination, reconstruction policy development, and population management. Through the development of disaster management programs, the government can achieve more effective coordination (Faisal & Kamal, 2024). In a broad sense, preparedness can be interpreted as knowledge about the early signs of a disaster or regular testing of early warning systems, evacuation plans, or other actions that must be taken during a period of alertness with the aim of minimizing physical damage and deaths that may occur.

Furthermore, according to (Gustini, Subandi, and Oktarina 2021) preparedness is a shared responsibility starting from stakeholders or parties who have an interest, such as the central government, local government, and the community. The role of the community in this preparedness is very important and needed in large numbers to reduce the amount of damage caused by disasters. This study is about the preparedness of the government and the community in facing floods in the Terboyo Genuk area. Disaster management is a systematic effort to deal with disasters appropriately and quickly to reduce casualties and losses. Continuous rain that fell on the city of Semarang on November 1, 2025, caused a large volume of water to come from various points, which ultimately could not be accommodated by the available drainage system. The city of Semarang was almost completely flooded, especially in the Genuk District of the Terboyo Industrial Area. The flood submerged all

roads, disrupted community activities and traffic, and caused severe damage to many residents' homes, particularly in living rooms, bedrooms, and kitchens. This flood disrupted residents' activities and hindered many residents or workers from outside Semarang City, such as Demak, who were heading to work in the Terboyo Industrial Area.

Based on data obtained from BPBD on November 1, 2015, the chronology of the causes of flooding was explained, namely due to high intensity accompanied by strong winds that caused several natural disasters and flooding that had occurred since October 24, 2025, with tidal water levels and water levels rising at 01.00. According to the data, Genuk District was the first to be affected, impacting 10 villages, including Bangetayu Kulon, Banjardowo, Gebangsari, Genuksari, Karangroto, Muktiharjo Lor, Terboyo Wetan, Terboyo Kulon, and Trimulyo, with water levels reaching 10-90 cm. Meanwhile, three other subdistricts, such as Gayamsari, were affected in three villages, namely Tambakrejo, Kaligawe, and Sawah Besar, with water levels reaching 15-60 cm. Semarang Timur affected two villages, namely Kemijen and Melati Biru, with an average water level reaching 10-30 cm, and finally Pedurungan affected the village of Muktiharjo Kidul with an average water level reaching 5-25 cm.

Table 1. Disaster Impact

Impact Category	Total
Wards Affected	16
Sub-Districts	4
Family Members	6,700
Total Population	2,100
Death Toll	4
Refugees	299

(Source BPBD 2025)

The impact of the flood disaster that occurred on November 1, 2025 caused significant damage in 16 villages, 4 subdistricts, 6,700 households, 20,100 victims, 4 fatalities, and 299 displaced persons. Based on this data, the flood that hit the Genuk subdistrict was not only triggered by high rainfall but also influenced by several environmental and infrastructure factors. The Genuk subdistrict experienced a significant land subsidence, so when it rained, water easily pooled and was very difficult to drain.

Table 2. Disaster Impact

Sub-District	Area (km²)	Area Proportion (%)	Family	Population
Mlati Baru	1.2	3.93%	264	790
Tambakrejo	1.5	4.91%	329	986
Kaligawe	1.75	5.76%	386	1158
Big Rice Field	2.1	6.87%	460	1378
West Bangetayu	1.92	6.29%	422	1266
Banjardowo	2.48	8.12%	547	1641
Gebangsari	1.22	4.00%	268	804

Sub-District	Area (km ²)	Area Proportion (%)	Family	Population
Genuksari	2.19	7.16%	480	1439
Karangroto	2.09	6.84%	477	1429
Kudu	1.85	6.06%	406	1216
North Muktiharjo	1.36	4.42%	297	889
East Terboyo	2.13	6.97%	468	1402
West Terboyo	2.37	7.76%	521	1561
Trimulyo	2.9	9.50%	636	1905
South Muktiharjo	1.7	5.57%	374	1120

(Source: BPBD 2025)

Based on data on land area, number of households, and population in each village in Genuk Subdistrict, it appears that areas such as Banjardowo, Trimulyo, and Terboyo Kulon have larger populations and numbers of households than other villages in Genuk Subdistrict. This condition shows that when flooding occurs, the burden of handling the situation in these areas is much more complicated because the number of residents affected is higher. The government needs to ensure adequate evacuation and logistics capacity to reach these densely populated areas. Meanwhile, subdistricts with large areas such as Trimulyo and Terboyo Kulon have wider flood areas, requiring drainage systems, water pumps, and easily accessible evacuation routes. From the community's perspective, the high number of families requires increased preparedness, such as the formation of flood-ready volunteers at the neighborhood or community level, the development of evacuation plans, and coordination among residents to minimize the risk of casualties. The data shows that the different characteristics of each sub-district require different preparedness strategies, both from the government and the community, so that flood management can be more effective and equitable. In addition to the impact of the flood disaster, there are also several evacuation points that have been set up to serve as temporary safety posts for residents affected by the flood. The locations of these evacuation points are as follows:

Table 3. Refuse Location

Refugee Shelter Location	Total Occupants (People)
Semarang University	15
Muktiharjo Kidul Village Hall	22
Baitul Manan Grand Mosque	60
Al Islah Mosque	50
Baiturrahman Prayer Room	11
Al Huda Prayer Room	3
Karangasem Genuk	16
Gas Station Trimulyo	20
Baitul Fath Prayer Room	35
Elementary School Trimulyo	20
H. Satori Prayer Room	10

Refugee Shelter Location	Total Occupants (People)
Resident's House RT 03/01	30
Baitul Izzah Mosque	15

(Source: BPBD 2025)

Flood evacuation points are shared at public facilities and places of worship that have been designated as temporary shelters. Several locations, such as the Jami Baitul Manan Mosque and the Al Islah Mosque, have become the locations with the largest number of refugees, accommodating around 60 and 50 refugees, respectively. This is because these two large mosques are located in areas that are relatively safe from high floodwaters. Other places such as the Muktiharjo Kidul Village Hall, Trimulyo Elementary School, and Trimulyo Gas Station are also being used as evacuation sites due to their easy access and proximity to residential areas affected by the flood. On the other hand, there are also several small prayer rooms such as the Al Huda Prayer Room and the H Satori Prayer Room that accommodate fewer refugees, between 3 and 11 refugees, who generally consist of elderly families or residents with limited mobility who need evacuation sites closest to their homes. In addition to public facilities, several residents also opened their homes as temporary evacuation sites, one of which was the home of a resident of RT 3 RW 1, which accommodated up to 30 people. This clearly shows the strong social solidarity among residents when facing an emergency situation. Overall, the distribution of evacuation sites across mosques, prayer rooms, residents' homes, and schools demonstrates the collaborative efforts between the community, government, and local institutions to ensure flood victims have a safe place during the emergency response period.

In an effort to mitigate the impact, the government is monitoring and surveying areas that are still affected by flooding. The Regional Disaster Management Agency (BPBD) is conducting assessments by opening public kitchens from October 26, 2025 at the BPBD office in Semarang and distributing logistics. Support from the National Disaster Management Agency (BNPB) and the Central Java Provincial BPBD has carried out 6 sorties of weather modification operations on Thursday, October 30, 2025. In addition, portable pumps were provided by the Water Resources Management Agency (BBWS) with 22 units from the Central Java Data Center (Pusdataru) 7 units, and the Central Java BPBD 1 unit, 1 unit from the Kudus District Disaster Management Agency (BPBD), 1 unit from the Jepara District Disaster Management Agency (BPBD), and 1 unit from the Semarang City Public Works Agency (DPU) located in Trimulyo Village, Genuk District. Based on data from the Genuk Disaster Management Agency (BPBD), Genuk District ranks second as the district with the highest average flood level, reaching approximately 80 cm.

Table 4. Flood Data

Sub-District	Flood Level (cm)
Banjardowo	±10–30
Gebangsari	±10–30
Genuksari	±10–30

Sub-District	Flood Level (cm)
Karangroto	±10–30
Kudu	±25
North Muktiharjo	±20
East Terboyo	±20–40
West Terboyo	±20–40
Trimulyo	±20–90
Tambakrejo	±20–40
Kaligawe	±20–60
Big Rice Field	±15–30
West Tlogosari	±10–15

(Source: BPBD 2025)

The high level of flooding in the Genuk District, especially in the Terboyo Industrial Area, shows that Terboyo is a region that is vulnerable and seriously at risk of flooding. The data presented not only illustrates the severity of the flooding but also highlights the enormous challenges faced by the community whenever there is increased rainfall and overflowing rivers. This situation clearly shows that flooding is not just a seasonal disaster but also a recurring threat that must be addressed with comprehensive and sustainable preparedness. Government preparedness plays a very important role, ranging from the provision of adequate drainage infrastructure, optimization of water pump performance, to the preparation of flood-prone maps that must be updated regularly. In addition, the government can also ensure that the early warning system works quickly and is accessible to the community at the neighborhood/community level, so that residents can take appropriate response actions when signs of potential flooding are detected. Furthermore, coordination between agencies such as the Regional Disaster Management Agency (BPBD), the Public Works Agency, the sub-district office, and volunteers is important so that the flood response can be more effective.

The high level of flooding in the Terboyo area poses a serious risk, given that this area is continuously affected. The community needs to prepare mitigation measures at the household level, such as storing important documents in waterproof containers, preparing emergency bags, and understanding the designated evacuation routes and assembly points. This preparedness plays an active role in maintaining environmental cleanliness, especially in gutters and waterways, so that drainage capacity is not further limited. Thus, flooding data is not only statistical information but can also be an important basis for assessing the extent to which the government and community preparedness has been implemented. The recurring flood disasters indicate that community and government mitigation efforts in planned flood management are key to improving safety from flood disasters in the Terboyo area in the future. High flooding data should serve as a reminder that increasing preparedness capacity is no longer an option but an urgent necessity so that the community can survive and recover

more quickly from the ever-present threat of flooding. Government and Community Preparedness Before Floods Occur.

In order to improve preparedness efforts before flooding occurs, the government has prepared various strategic measures focused on strengthening infrastructure, information systems, and inter-agency coordination. First, portable pumps have been placed at a number of flood-prone locations to speed up the process of draining water. Flood management efforts require ongoing preventive measures from various relevant agencies to maximize results and performance. Coordination is the process of integrating activities between work units from various institutions so they can work together to achieve common goals (Cintya Febrianti Nuraini & Abdul Rahman, 2025). The government has also formed a Disaster Preparedness Forum (FSB) consisting of community leaders, youth organizations, civil defense forces, and PKK women's groups, who serve as the front line for monitoring environmental conditions. In addition, the government has mapped flood-prone areas using a color-coded system: green for flooding that recedes within 1 day, yellow for flooding that lasts 3 days, and red for flooding that lasts more than 7 days. The government also routinely cleans rivers and drainage channels. In emergency situations, the government sets up public kitchens and health posts and conducts intensive monitoring through reports from officers at the Pucang Gading Dam sluice gate, which provides information on water levels categorized as safe, alert, and warning.

Some residents still don't fully understand disaster risks, while information from the Regional Disaster Management Agency (BPBD) is often not delivered in a timely manner. This highlights the need to strengthen the social role of village governments through two-way participatory communication to actively engage the community in the mitigation process (Alhadi & Ilham, 2025). From the community's perspective, it plays an important role in preparedness before the arrival of floods. The community is encouraged to actively participate in the Flood Preparedness Forum established by the Regional Disaster Management Agency (BPBD) to ensure faster coordination during emergencies. In addition, the community helps maintain environmental cleanliness by not throwing garbage into waterways and participating in community service activities to clean rivers and drainage systems. Before floods occur, the community also needs to prepare evacuation routes, determine assembly points, and ensure that designated evacuation sites are ready. Thus, structured and continuous preparedness is key to minimizing losses and protecting the safety of residents.

CONCLUSION

This study reveals that Terboyo Industrial Area in Genuk District exhibits high flood vulnerability due to extreme rainfall, land subsidence, and drainage limitations, with government preparedness encompassing portable pumps, Disaster Preparedness Forums (FSB), color-coded flood mapping, and emergency facilities like public kitchens and health posts [BPBD, 2025]. Community participation demonstrates social solidarity through evacuation route planning, environmental maintenance, and FSB involvement, yet reveals

gaps in disaster literacy and coordination between agencies. November 2025 floods affected 6,700 households across 16 villages with 20,100 victims, underscoring the necessity of government-community synergy for effective flood mitigation [Zuliani & Sufendi Hariyanto, 2021; Gustini et al., 2021].

Despite comprehensive findings, limitations include focus on government perspectives with limited direct resident interviews, potentially overlooking household-level experiences, and single-site analysis restricting generalizability beyond Semarang's industrial-coastal contexts. Future research should employ mixed methods incorporating resident surveys across multiple districts and longitudinal tracking of FSB effectiveness. Practically, findings urge enhanced community disaster education, real-time BPBD communication apps, routine drainage maintenance, and inter-agency drills. Strengthening FSB capacity through youth volunteer training and household emergency kits distribution will build resilience, supporting sustainable urban development amid escalating climate risks [Alhadi & Ilham, 2025; Lestari et al., 2024].

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