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MORALITY BEFORE KNOWLEDGE

Bridging awareness and action in flood risk reduction: Insights from a community-based evaluation

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ABSTRACT

Background: Flooding is a disaster that continues to be faced by Indonesia. Every year, floods inevitably occur. From year to year, the number of floods continues to increase. This is why we conducted a study on residents' knowledge regarding flood prevention in their environment. **Methods:** This research aims to evaluate the knowledge of Tomang residents about flood prevention methods using a qualitative approach, employing semi-structured interviews and observation techniques. **Findings:** Through this process, the research findings show that the people of Tomang possess varying levels of knowledge regarding flood prevention. Most residents are already aware of the importance of maintaining drainage systems and managing waste, although they face various challenges in fully implementing these preventive measures. **Conclusion:** The results of this study indicate that more intensive education and outreach, along with greater involvement and active participation of the community in flood prevention programs, can help prevent flood disasters in the area. Based on these findings, we hope that this information can serve as a foundation for flood prevention and risk reduction at the local level. **Novelty/Originality of this article:** The novelty/originality of this article lies in evaluating Tomang residents' knowledge of flood prevention using a qualitative approach, revealing implementation gaps despite their relatively good awareness.

KEYWORDS: flood prevention; knowledge; Tomang community; disaster; outreach.

1. Introduction

Global warming is a topic that is often discussed but also frequently ignored. Most of us may have thought about its negative impacts but have done little to reduce global warming. Due to the general apathy of Indonesian society, global warming is worsening. In reality, global warming is a major cause of many natural disasters around the world, such as floods, wildfires, and droughts. In Indonesia, the most common natural disaster is flooding. According to an evaluation by the World Risk Index (WRI), which assesses the threats faced by 193 countries—including all UN members and covering 99% of the global population—Indonesia ranked as the second highest country at risk of natural disasters in 2024 (Sinta, 2025). This study evaluates the risks of extreme weather, conflict, pandemics, climate change, population growth, political instability, water crises, and natural disasters. The WRI

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report states that Indonesia scored a risk index of 41.13, just below the Philippines with a score of 46.91.

From 2013 to 2023, the incidence of flood-related disasters in Indonesia increased, with the highest number recorded in 2021, reaching 1,794 flood events (Pratiwi, 2024). As of January 13, 2025, floods had already occurred 58 times, making up 80% of the disasters in Indonesia that year (Belarminus, 2025). Floods not only damage residential areas and the environment, but also force many local residents to relocate. Moreover, floods can also cause various diseases among the population, such as skin infections, diarrhea, cholera, leptospirosis (a bacterial infection caused by Leptospira), dengue fever, typhoid fever, and malaria.

Despite the frequent occurrence of floods in Indonesia, the public still struggles to adequately respond to them. Therefore, it is crucial to provide education and awareness campaigns about flood management to the Indonesian population—not only to increase their understanding of flood disasters, but also to help them prepare effectively, so this knowledge can be passed down to future generations.In this study, we focus on examining public understanding of flood disasters in West Jakarta. As of Saturday, February 8, 2025, 16 Neighborhood Units/ *Rukun Tetangga* (RT) in West Jakarta had been affected by floods caused by heavy rainfall (Rachmadina, 2025). In this research, we conducted interviews and studied the flood disasters that occurred in the area. We also explored the impacts of these floods, such as environmental damage, population displacement, and other related effects. Through this study, we hope to analyze and identify appropriate solutions so that the people of West Jakarta can better understand floods, know what to do when a disaster occurs, and learn how to prevent future flooding.

1.1 Flood

Flooding is a condition in which rising water levels overflow beyond their natural or artificial boundaries, inundating areas of land that are usually dry—such as a river overflowing into the surrounding land (The Information Architects of Encyclopaedia Britannica, 2025). Flood disasters are usually caused by several factors, such as high rainfall, the accumulation of waste in waterways, poor dam management, and others. Flooding has occurred frequently in many parts of the world, and Indonesia is no exception to the widespread occurrence of flood disasters (WHO, 2019).

According to the Health Crisis Center of the Indonesian Ministry of Health, floods can be categorized into five types (Regional Disaster Management Agency of East Java Province, 2023). Flash floods or "*banjir kiriman*" occur due to heavy rainfall in the upstream areas of a river. This disaster happens when the area is no longer able to absorb the intense rainwater. Flash floods are extremely dangerous as they can carry away anything in their path. This type of flood causes the most severe damage and can result in many casualties. Water floods "*banjir air*" happen when lakes, rivers, or drainage systems overflow. Mud floods "*banjir lumpur*" are similar to flash floods, but in this case, the mud emerges from within the earth and contains hazardous substances and gases that can negatively impact the health of living beings. Tidal floods "*banjir rob*" are caused by sea tides. They usually occur in coastal areas where the land is lower than sea level. Also known as "*banjir lokal*," local floods are similar to water floods. They commonly occur when the drainage capacity is insufficient to handle the volume of rainwater, causing rivers, lakes, or drains to overflow.

1.2 Cause of flood disasters

The causes of flooding can be simplified into two main factors: natural factors and human factors. Natural factors are those beyond human control, such as high rainfall, regional topography, tidal fluctuations of rivers, erosion, physiographic influences, inadequate drainage capacity, and others. These natural factors are difficult to control, and even when possible, they often require significant costs. On the other hand, human factors stem from population growth, which leads to increased demand for infrastructure, housing,

clean water facilities, education, and other public services. In addition, population growth is followed by the need for land for agriculture, plantations, and industrial activities (Balahanti et al., 2023). The demand for business land and infrastructure development directly affects land use planning, resulting in reduced water absorption capacity into the soil. Furthermore, as land becomes more exposed, the topsoil is more easily eroded by rainwater, causing sedimentation in rivers, which in turn reduces their water-holding capacity. Population growth also leads to increased waste production. If waste management is poor, it can clog waterways, contributing to flooding (Setiawan et al., 2020).

1.3 Flood in Indonesia

The western part of Indonesia is the region most frequently affected by flood disasters, especially during the rainy season. This is because the western region experiences higher rainfall levels compared to the eastern region (Yutantri et al., 2023). According to disaster statistics compiled by the National Disaster Management Agency (BNPB), there were 8,333 flood events in Indonesia between 2014 and 2023. Although the trend over the past ten years has been dynamic, the data show a steady increase in flood incidents from 2015 to 2020, with the exception of 2019. The year 2020 marked the peak, with 1,531 flood incidents across Indonesia. In that year alone, floods claimed 132 lives, and 3,843,714 people were affected. Additionally, 28,824 houses, 511 educational facilities, and 625 places of worship were damaged (Evandio & Tolok, 2024).

Although 2021 had fewer incidents than 2020 (a difference of 335 incidents), it had the most severe impact. In 2021, floods caused 337 deaths and affected 4,273,938 people. That year also saw damage to 98,717 houses, 913 educational facilities, and 818 places of worship. On the other hand, the number of flood incidents began to decline starting in 2021. Over the past decade, 2023 recorded the fewest floods, with only 351 incidents (Rasyid, 2024). BNPB reported that from January 1 to March 17, 2025, Indonesia had already experienced 641 disaster events, most of which were wet hydrometeorological disasters such as floods, extreme weather, and landslides. The increase in rainfall intensity has contributed to the rising frequency of these disasters. The recorded impact includes 110 deaths, 17 missing persons, 121 injuries, and 2,245,787 people affected and displaced. BNPB noted that flooding continues to dominate as the most common disaster in Indonesia, with a total of 441 cases reported in 2025 (Tuter, 2025). These data clearly show that floods continue to cause significant losses in Indonesia year after year, and the people of Indonesia must be prepared for disasters in the future.

This study focuses on Tomang Urban Village, located in Grogol Petamburan District, West Jakarta. Tomang has an area of 1.88 km^2 and consists of 16 Community Units/ *Rukun Warga* (RW) and 174 neighborhood units. This area is one of the densely populated areas with mixed settlement characteristics between old residential areas and new developments. Historically, Tomang is an area prone to flooding. Significant flooding events occurred in 2015, 2020, and 2025. For example, in February 2015, hundreds of houses in the Tomang Utara 2, Mandala Utara, and Mandala Selatan areas were submerged due to high rainfall. According to RW 10 resident Herman, water started to enter the house at around 11:00, with a height reaching 50 cm on the road and ankle-deep inside the house. Then, in February 2020, and, on November 22 a sudden flood caused water to pool (10–20 cm deep) on the Jakarta–Tangerang toll road at KM 24, near Tomang. Jasa Marga reported that the lane had been restored by evening, but the incident highlighted the vulnerability of drainage during heavy rain. Tomang was again affected by flooding. Extreme rainfall reaching 226 mm per day caused several points in this sub-district to be flooded. This incident shows that although the community has realized the importance of environmental and water channel management, challenges in flood mitigation are still a major concern (Detik News, 2025).

1.4 Cause of flood in Jakarta

As previously discussed, the flooding that occurs in Indonesia, including in Jakarta, is a recurring issue that happens year after year. This happens due to several factors, as outlined below.

1.4.1 Geographical location of Jakarta

The first factor contributing to the frequent flooding in Jakarta is its geographical location in a lowland area. Approximately 50% of Jakarta lies close to rivers—about 13 rivers in total—which makes the city prone to flooding from river overflows during the rainy season. Moreover, these floods often affect commercial areas in various parts of Jakarta, leading to economic downturns (Eldi, 2020).

1.4.2 Jakarta's population and urbanization

Another cause of flooding in Jakarta is the ever-increasing population. According to population data from the Directorate General of Population and Civil Registration (Dukcapil) of the Ministry of Home Affairs, as of mid-2024, the population of DKI Jakarta reached 11.34 million people. Of this, 2.61 million reside in West Jakarta, 1.87 million in North Jakarta, 2.41 million in South Jakarta, and 3.31 million in East Jakarta—the highest number—while the lowest is in the Thousand Islands Regency, with only 30.42 thousand residents.

This large population significantly contributes to annual flooding, as more land is converted into residential areas, reducing the space available for rainwater absorption. Urbanization further exacerbates this issue. Many people migrate from smaller cities to major cities like Jakarta due to uneven development of facilities across Indonesian cities, making Jakarta a prime destination for job seekers (Januari et al., 2024). The rapid population growth brings negative impacts, such as rampant littering and poorly designed urban planning and housing, which increase the frequency and severity of floods (Eldi, 2020).

1.4.3 Natural factors

During the rainy season, rainfall intensity naturally increases. This becomes a major issue in cities lacking adequate areas to absorb or retain water. As seen in Jakarta, poor infrastructure planning and decreasing natural water retention capacities result in heavy rainwater overflowing and flooding residential areas. Rainwater that cannot be absorbed properly and quickly turns into floods. Climate change also plays a role, with side effects now being felt, such as rising sea levels caused by melting glaciers (Nurlambang, 2022).

1.4.4 Infrastructure and facilities

Another factor contributing to flooding is the state of infrastructure and facilities in Indonesia, particularly in Jakarta. According to Aminullah Wanca, land development in Jakarta has drastically increased over the past decades. In the 1980s, only around 59% of the city was developed, but by 2021, this had surged to 93%. In addition, poor urban drainage systems are a key reason for frequent flooding. This can be caused by irresponsible property owners or financial constraints that prevent proper water management.

Furthermore, drainage systems are often clogged with mud that is neither dug out nor cleaned, significantly reducing their water-holding capacity. Drains that should channel water become blocked and ineffective. Poor infrastructure design also plays a role, as such planning often results in land with minimal water flow systems. This poor design leads to anxiety among residents during the rainy season, since ineffective drainage systems mean

rainwater is not absorbed or channeled properly and ends up flooding roads during heavy rain (Sarifah et al., 2024).

1.4.5 Community activities and awareness

As technology advances, people's jobs in cities have gradually shifted from farming and livestock to office work. This shift has led to land use changes, with more land being used to build housing and office buildings. These land use changes reduce areas available for water absorption. It's not just due to modernization—according to an urban planning observer from Trisakti University, flooding in Jakarta is not only caused by infrastructure or natural factors but also by the public's neglect toward the environment. Many drainage channels have narrowed and become shallow. Additionally, waste buildup caused by people's habit of littering worsens the ability of drainage systems to function, causing blockages that aggravate flooding conditions. He also criticized the lack of maintenance for flood control systems, such as dredging and normalizing waterways, which should be done regularly. According to him, the combination of public behavior and neglected flood control systems makes Jakarta increasingly vulnerable to flooding (Werdiono, 2025).

1.5 Impact of floods

Floods have numerous negative impacts on the social and economic aspects of a community. Starting with the social impact, when floods last for several days, local residents are often forced to evacuate their homes and move to safer areas. In many cases, floods damage or destroy homes, leaving people without adequate shelter once the disaster has passed. With communities displaced and removed from the comfort of their homes, their daily activities are also disrupted. For example, many students struggle to participate in school activities after being affected by floods and having to evacuate—often leaving their schoolbooks behind. Many of them also face difficulties in physically getting to school due to transportation disruptions caused by high floodwaters. This clearly hinders their access to quality and comfortable education. Not only students, but also breadwinners face difficulties getting to work for similar reasons. Some even have to use boats to reach their workplaces because the flood prevents the use of personal vehicles until the water recedes. Many people lose their jobs, making it difficult for them to meet basic needs such as food, clean water, clothing, and other essentials. This is especially devastating for those who were already financially struggling before the flood.

Public health also suffers during flood disasters. People become more vulnerable to skin diseases because floodwater mixed with river water and waste contains bacteria, germs, and other harmful substances. Other illnesses like cholera can easily spread through contaminated water, and there is also an increased risk of contracting Dengue Fever (DBD), as floodwaters create ideal breeding grounds for mosquitoes (Akbar et al., 2025). In the economic sector, floods can lead to agricultural losses, damage to aquaculture operations, and harm to infrastructure. Agricultural losses occur when floodwaters inundate farmland and submerge crops. Agriculture is a controlled process, and water is a crucial factor that must be monitored and regulated—from its source to its content—to ensure healthy crop growth. Floodwater, on the other hand, is uncontrolled and is a mixture of rainwater, river water, sewage, and other contaminants. This type of water contains minerals and impurities that can negatively affect plant growth, often rendering crops unsuitable for sale. In addition to crop damage, harvests can be ruined, reducing farmers' productivity and income, making it harder for them to meet their daily needs.

Losses in aquaculture—particularly fish farming—can occur when floods wash away fish that fishermen have worked hard to catch. Floods can also damage fishpond infrastructure and sweep away fishing equipment. This puts fishermen in a difficult position, as they not only lose their source of income but also face extra costs to repair facilities and replace lost gear (Arisanty et al., 2021). Flooding also frequently disrupts access to roads and transportation. Infrastructure damage can occur when rainwater

cannot drain properly and begins to pool on asphalt roads. If left for an extended period, the road surface deteriorates, leading to potholes and an increased risk of accidents. Floods also carry trash that clogs and damages drainage systems. As a result, governments must allocate funds to clean and repair these systems. Buildings such as schools and hospitals are also affected. Flooded roads or buildings reduce public access, which in turn hampers public services, including essential ones like healthcare (Lu et al., 2024). Floods don't just cause physical damage; they also significantly increase the financial burden on the government. Authorities must spend money on infrastructure repairs, rebuilding damaged buildings, and assisting displaced or injured residents (Sarifah et al., 2024).

1.6 Flood prevention

Many efforts have been made by both the government and the community to prevent or at least reduce the impact of flooding. Programs such as flood prevention, rehabilitation, and infrastructure improvements have been implemented as part of flood mitigation strategies. Below are some of the measures that can and have been taken by both the government and the public (Fitriyati et al., 2024). Rivers that were previously blocked have begun to be cleaned. Many rivers were clogged with sediment, mud, trash, and vegetation. These obstructions have started to be cleared to allow smoother water flow (Sofa, 2023). As a result, the water-holding capacity of rivers has increased. Urban drainage systems have also been managed more effectively, with regular maintenance applied to drainage channels, including cleaning, repairing, and increasing their capacity to ensure rainwater flows properly (Rahmadhani, 2023).

One example of this management is the work done on the Ciliwung River in the Kebon Baru area of Tebet, South Jakarta. A total of nine excavators were deployed to dredge the built-up mud. As a result, the Ciliwung River became significantly cleaner, its water capacity improved, connecting channels functioned effectively, and the area became better prepared to handle high rainfall. Another example of flood mitigation efforts is the provision of stationary pumps throughout Jakarta. A total of 549 stationary pumps have been installed at 195 different locations, along with 799 water gates at 547 different sites to help manage water flow. Two of these water pumps are located in Ancol, North Jakarta, and Gunung Sahari, Central Jakarta (Ramdan, 2023).

Another major initiative is the integrated watershed (DAS) management program. A watershed is a land area bounded by hills or mountains where rainwater is collected and channeled from small streams into a main river. Watersheds serve as natural water storage systems. In Indonesia, provincial governments have undertaken reforestation and forest conservation programs by planting more than 57,000 mangrove trees, 77,000 shade trees, and 4 million ornamental plants around Jakarta (Simorangkir, 2023). These efforts help ensure sustainable water flow, reduce erosion, and increase water absorption by vegetation. Plants not only bind soil with their roots, but also reduce the impact of raindrops with their leaves. While a single drop may seem insignificant, thousands of raindrops over time can loosen the soil, leading to erosion. Reforestation improves the soil's ability to absorb water, reducing the risk of landslides and floods, increasing agricultural productivity, and improving water and air quality (Rahmadhani, 2023).

The next program is PPSU (Public Infrastructure and Facilities Handling). PPSU is a team of individuals responsible for clearing sludge or trash that may accumulate near water channels. For example, 15 joint officers from the Water Resources Sub-department (SDA) drained sludge from drainage systems on Jalan Cilandak Bawah RT 10/RW 13, in Cilandak Barat, South Jakarta. Due to sludge blockage, the water-holding capacity of the drains was reduced, causing overflow onto the roads. PPSU officers cleaned 400 meters of drainage channels, 60 cm wide and 30 cm deep. Over three days of dredging, 380 sacks of sludge were collected. They estimated the work would be completed by the end of March 2021 (Wiguna, 2021).

Flood prevention programs would not be complete without community involvement. The government has launched awareness programs to educate people about flood disasters

and how to prevent them. These programs aim to inform the public about waste management and how to protect themselves during floods. Many people still have bad habits such as throwing garbage into rivers or drains, which blocks water flow and reduces the soil's ability to absorb water, thereby increasing flood risk (Rahmadhani, 2023).

One example of such a program is the "Bakti Kita untuk Jakarta" (Our Service for Jakarta) campaign, which took place on November 19, 2023. Acting Governor of Jakarta Heru Budi Hartono, Jakarta Provincial Secretary Joko Agus Setyono, assistant secretaries, heads of regional organizations (OPD), state-owned enterprises (BUMD), and civil servants (ASN) gathered in the morning to conduct a mass community cleanup. Together with local residents, they cleaned water channels, from the small drains in front of houses to nearby rivers (Simorangkir, 2023).

1.7 Theoretical studies

1.7.1 Vulnerability framework

Understanding flood risk in urban communities requires a strong grasp of the concept of vulnerability. According to the Intergovernmental Panel on Climate Change (IPCC, 2001), vulnerability consists of three interrelated components: exposure, sensitivity, and adaptive capacity. Exposure refers to the degree to which a system may come into contact with a disturbance; sensitivity indicates how susceptible that system is to harm; and adaptive capacity is the community's ability to respond to and recover from such impacts. In the case of urban flooding, vulnerability tends to rise when exposure and sensitivity are high, and adaptive capacity is low. Contributing factors such as inadequate drainage infrastructure, overcrowded housing, and violations of building codes like Koefisien Dasar Bangunan (KDB) intensify sensitivity and exposure, while aspects like socioeconomic conditions, institutional support, and local knowledge influence a community’s adaptive capacity (IPCC, 2001; Estoque et al., 2023).

1.7.2 Why some people are more at risk during floods

Furthermore, vulnerability can differ depending on the time of day. It appears that individuals who remain at home during the day, women, children, and the elderly are commonly more vulnerable during flood events, because of their limited mobility and lack of access to information. These time based vulnerabilities are important for assessing community readiness and risk (Rufat et al., 2015). Not just that, but age differences and occupation can also be key factors in high-risk vulnerability, based on research by Syarif et al. (2022), which found that 45% of housewives knew about flood incidents and how to prevent them from happening. Meanwhile people that are S1 graduates have 57% of knowledge about flood. these can be a major factor on how certain people can be vulnerable during floods

1.7.3 Being vulnerable vs being resilient

Vulnerability and resilience are coordinated: resilient communities are not just those that survive a disaster, but ones that recover quickly and adapt to the threats in the future. Therefore, assessing vulnerability is key for identifying the resilience level of any urban neighborhood (Lecina-Diaz et al., 2024).

1.7.4 Why local knowledge and community ability matter

Features the role of local knowledge and community capacity in forming flood adaptation strategies. Physical, social and economic factors such as drainage conditions, household sizes, and income must be recognized in order to design targeted and effective risk reduction programs (Laeni et al., 2020; Ndue et al., 2023).

1.7.5 Knowledge gap theory

In addition to vulnerability theory, this study also draws from the Knowledge Gap Theory (Communication Theory, 2017) proposed in 1970 by Philip J. Tichenor, George A. Donohue, and Clarice N. Olien of the University of Minnesota. This theory states that as mass media disseminates information throughout a social system, individuals from higher socioeconomic groups tend to acquire that information faster than those from lower socioeconomic groups, resulting in an ever-widening gap in public knowledge. In simple terms, as access to mass media increases, those with economic advantages continue to gain information more quickly, while poorer communities are often left behind. This issue is compounded by rising technological costs, which further exclude lower-income groups from accessing digital or media-based information. If access to information is not made equitable across all segments of society, the knowledge gap will continue to grow, and those with greater resources will continue to benefit more—leaving vulnerable populations at an even greater disadvantage.

2. Methods

For our research, we used a qualitative method by applying semi-structured interview and observation techniques. We conducted observations to examine the conditions and environment in areas that are frequently affected by floods. We chose the qualitative method with the aim of directly observing the situation in the field and listening to the experiences of residents who live in the area and have previously been victims of flood disasters. We investigated how these residents deal with the recurring floods during heavy rainfall, how they anticipate future flooding, how much knowledge they possess about floods, and what steps they have taken to minimize the occurrence of floods in the future. We conducted our research in West Jakarta, as the location was relatively close and accessible to us. We chose to interview residents living in Tomang, Grogol Petamburan.

This area was selected because its residents have previously experienced flooding, making it highly relevant to the focus of our research. We were also able to examine how the community in that area works to reduce the likelihood of future flood disasters. Our data was not only obtained through interviews with the residents of Tomang. We also conducted further research using published journals on flooding in Jakarta, news reports covering flood events in the city, and data sourced directly from the government via official websites. Through these methods, we hope to conduct a thorough study on the level of knowledge and preparedness of West Jakarta residents in dealing with the frequent flood disasters in the area. We also hope that through this research, an effective solution can be identified and implemented so that flood disasters can be reduced, and the residents no longer need to live in fear.

3. Results and Discussion

Flooding is a continuous issue in Jakarta especially in heavily populated urban areas like Tomang. Flood prevention doesn't only rely on infrastructure but also on public awareness and behavior. According to researchers, participation within the community plays a crucial role in disaster risk reduction. Therefore, the objective of our study is to observe the level of knowledge of Tomang residents about flood prevention, government programs and proper waste management within the area. The discovery from our interviews deliver insight into how well educated the community is on flood prevention as well as the things that they may not have a lot of knowledge about. After conducting interviews around the Tomang area, we were able to speak with several individuals and gather the information needed for our research data collection. Below are the results of our interviews, along with the questions we asked the respondents.

Table 1. Residents' knowledge and practices on flood prevention in Tomang

No.	Questions	Citizen initial's and affiliation's	Answers
1.	Are you aware of any government programs or policies related to flood prevention in your area? If not, what do you think the government should do to prevent flooding in your area?	Mrs. J (Noodle seller)	Yes, the standard law is that you are not allowed to litter.
		Mr. I (Head neighborhood)	The government is already prepared to handle flood issues
		Mr. D (Guard)	PPSU handles clogged water so that the water keeps flowing.
2.	Do you take any specific actions at home or in your surrounding environment to prevent flooding? If yes, what do you do? If not, what measures do you think can be taken to prevent flooding?	Mrs. J (Noodle seller)	Every morning the neighbors always clean and sweep the front of their houses or shops to collect trash to be thrown away in its place.
		Mr. I (Head neighborhood)	Anticipate and make improvements to the rivers.
		Mr. D (Guard)	Find the source of what's causing the water to pool and take care of it so that the water will drain away.
3.	Do you know how to manage waste in a way that doesn't worsen flooding?	Mrs. J (Noodle seller)	There are cleaning staff who always transport garbage to the recycling site.
		Mr. I (Head neighborhood)	Take initiative to throw trash in trash cans. If there's trash nearby don't burn it, throw it away to its place.
		Mr. D (Guard)	If there's trash, throw it away to its place so that it can be recycled by the cleaning staff.
4.	In your opinion, how important is the role of greening or tree planting in flood prevention?	Mrs.J (Noodle seller)	It has made an impact but in areas that already have a lot of trees, not in big cities.
		Mr. I (Head neighborhood)	Greening on the riverbank can prevent erosion.
		Mr. D (Guard)	It's important as it makes the air cooler and less hot.
5.	According to you, how can the community and the government work together to prevent flooding?	Mrs.J (Noodle seller)	There needs to be a law regarding the disposal of waste in its proper place which must be enforced so that the public will obey it.
		Mr. I (Head neighborhood)	Just keep throwing trash to its proper place.
		Mr. D (Guard)	There needs to be a community service program from superiors.

To assess the level of knowledge possessed by the informants, we established knowledge standards that are generally expected to be held by the community. With these standards, we can evaluate whether the informants have knowledge that is below, at, or above the average knowledge commonly known by the public. The first standard is whether the residents are aware of past disasters that have occurred in their area and the impacts caused by those disasters. This is a standard because, generally, people should know about disasters that have happened in their surroundings and the resulting effects, especially if they were directly affected by such events.

The second standard is whether the residents know how to prevent flooding and whether they have applied those preventive measures in their daily lives. This is a standard because flood prevention methods have been taught since elementary school and continuously reminded by other community members and the government. Simple flood

prevention methods, such as not littering, should be common knowledge among the public. However, although many people know how to manage and prevent floods, not many actually implement these actions daily. This could be caused by a lack of awareness, both logically and empathetically. It could also be due to outdated mindsets, where people do not see long-term consequences and only prioritize immediate convenience and enjoyment. Therefore, this standard helps determine whether the residents are knowledgeable and actively involved in preventing floods in their area or not.

The last standard is the community's knowledge of government programs to prevent flooding and their understanding of how these programs work. This is important because if residents know and understand how government programs operate in their area, it means they are aware and concerned about the environment and continuously seek information about efforts to mitigate flood disasters. Residents who truly understand the importance of flood prevention should know what programs the government has implemented in their area to address the disaster. It is even better if they participate in implementing these programs. From the table above, these three informants have different basic knowledge levels about flood management, considering that each plays a different role in the community. The first informant is Mrs. J, who sells noodles in the Tomang area. The second informant is Mr. I, the neighborhood leader of RT 009 RW 04 Tomang. The third informant is Mr. D, a security guard working at the main gate of the RT 009 RW 04 Tomang neighborhood. Using these standards, we can determine which of these three informants meet the criteria. This pie chart represents the percentage of interviewees who meet the criteria we have established. If a name appears in the pie chart, it means they meet the specified criteria. If a name is not included in the chart, it means they do not meet the criteria we set.

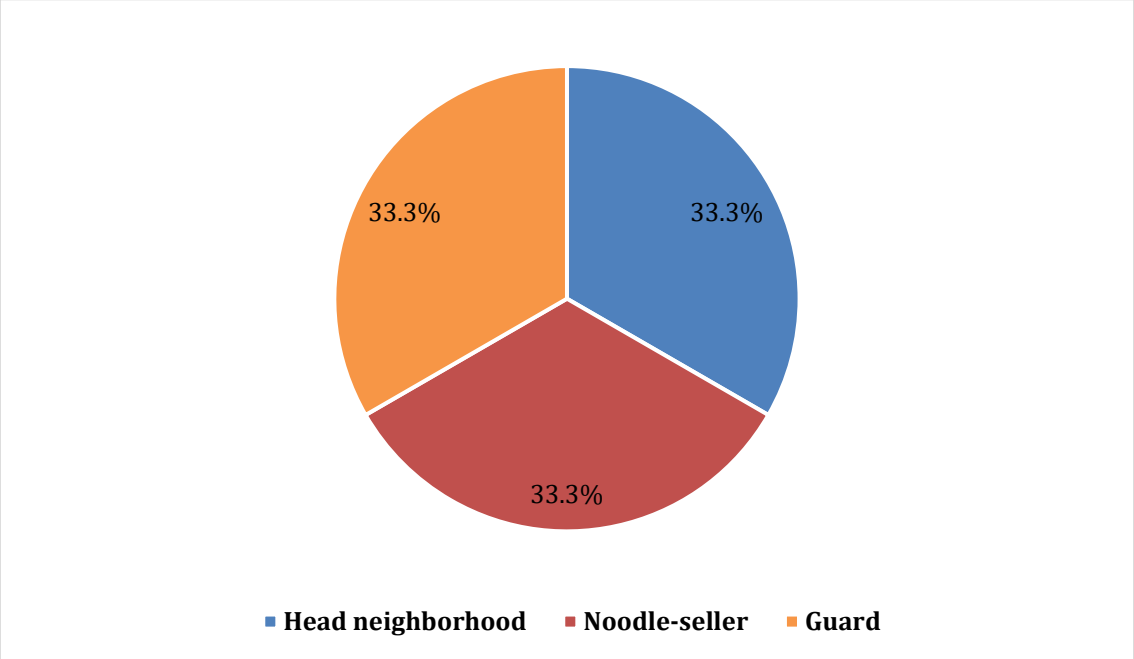

Fig. 1. Residents know about disasters that have occurred in their environment and the impact of these disasters

For the first standard, all three meet the requirement. Based on their answers throughout the interview, they were able to clearly explain the disaster and its impacts, from the noodle seller to the security guard in the Tomang area. For the second standard, only Mrs J and Mr D meet the criteria. Mrs J and Mr D have general knowledge about how to prevent flooding and apply flood prevention measures in their daily activities. Both explained sincerely and in detail that they separate their waste and do not dispose of trash carelessly. When we interviewed Bu J at her shop, we saw a large plastic bag containing used

plastic bottles. This proves that the government has been able to effectively convey knowledge about the harmful impacts of flooding as well as ways to prevent it.

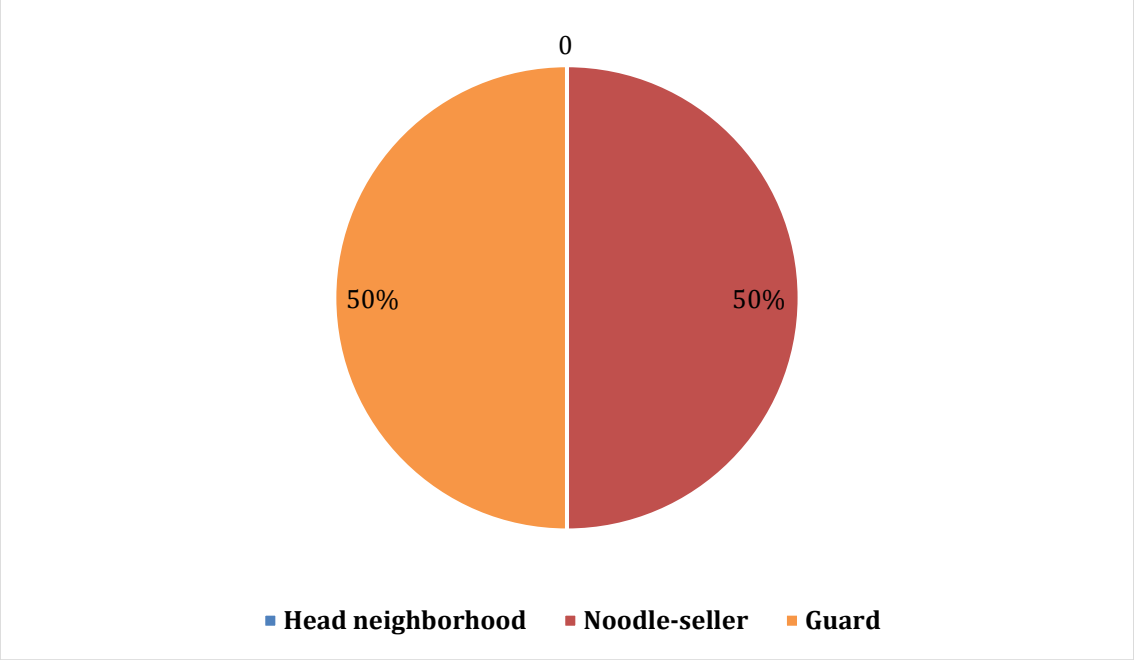

Fig. 2. Residents know about how to prevent flooding and also apply flood prevention methods in their daily activities

For the third standard, only Mr D meets the criteria. Mr D is aware of the government programs aimed at flood prevention and can explain in detail how these programs work. He actively participates in activities such as cleaning drains clogged with sediment and trash. Mr D can describe government initiatives like community service programs and the installation of water pumps. This not only demonstrates Mr D's knowledge but also proves that the government has implemented flood prevention measures, which have contributed to the faster receding of floods in the Tomang area, indicating the success of these programs.

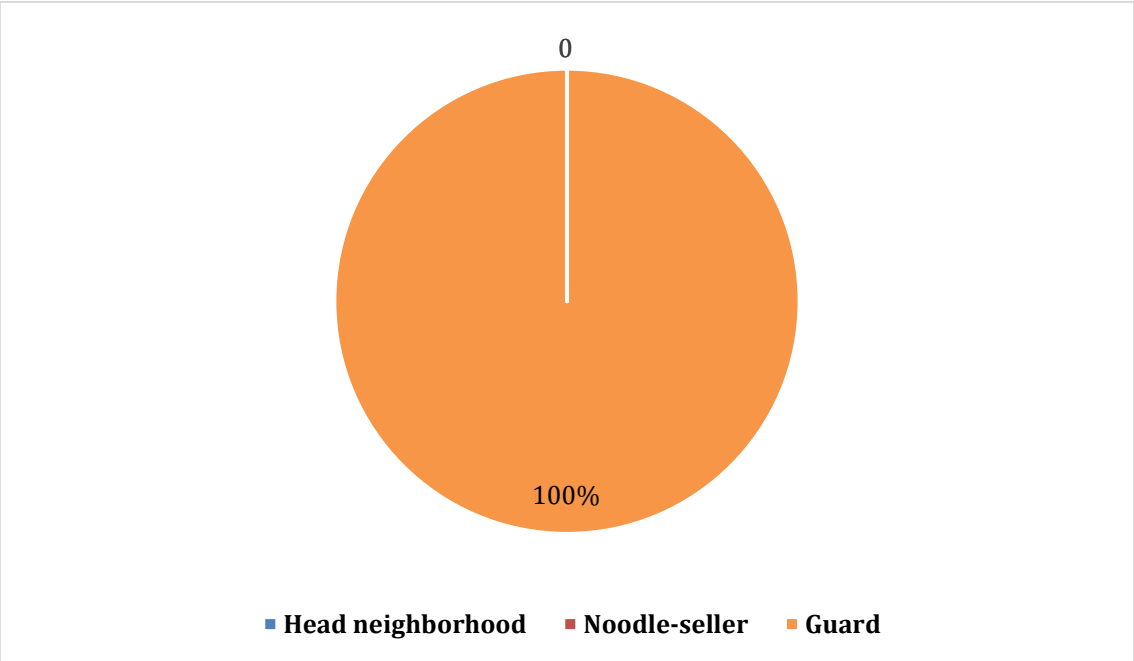

Fig. 3. Residents are aware of the programs the government has provided to prevent flooding and can explain how they work

Looking at the overall results of the interviews, we reached the conclusion that among the three sources we interviewed, Mr. I, who is the neighborhood chief in the area, met only a few of the standards. This is very unfortunate because, based on the journals we have reviewed and studied, most solutions to prevent flooding can be carried out by someone who holds a leadership role in the community. Actions such as reforestation, cleaning drainage channels, and regular communal work are easier to organize by someone with a position in the area. Mr. I's position not only makes it easier for him to carry out these activities using his connections and funds, but he can also inspire the local residents to do the same. Mr. I, as the neighborhood chief, should have deeper knowledge regarding floods, which are quite frequent disasters in the area. From our interview results, Mr. I only has limited knowledge about flood mitigation topics. The limitation of his knowledge could also be caused by the lack of action he did when the flood came. Rufat et al. (2015) says that the people who spend time indoors tend to gain less information about the situation happening around them, there's a higher chance that Mr. I only heard about it through television news, hence the lack of knowledge he has of floods around Tomang.

Conversely, the source who met all the standards we set was Mr. D, the security guard stationed in the area. This is due to his position in the community, which facilitates Mr. D's access to flood prevention and cleanup activities organized by the local government. Mr. D was able to explain the flood events that have occurred in the area, the ways to mitigate flooding, how to carry them out, and he actively participates in flood mitigation programs held by the government. This is certainly a very positive aspect, and someone like Mr. D should serve as a role model for other residents to be more active in flood mitigation. Mr. Dimas also provided information that we previously did not have, such as how the local government has been conducting regular drainage cleaning actions. This aligns with what Rahmadhani (2023) explained, that routine maintenance of drainage channels in residential areas can reduce flooding because water can flow smoothly and quickly, preventing the inundation of residents' land. This is evidenced by how quickly floodwaters recede when flooding occurs.

Mrs. J has a fairly good level of knowledge and meets two of the standards we set: knowing about previous flood disasters in the area and knowing how to mitigate floods and applying this in daily life. However, Mrs. J has not met the third standard, which is knowledge about government programs organized to handle flooding. This can be understood, considering that Mrs. J is only a noodle seller and does not hold a high role within the community, so she does not have easy access to detailed information about government programs. However, this can be seen as proof that government programs have not been well disseminated because there are residents who are unaware of these programs. Mrs. J is already active in doing things that can reduce flood disasters, such as collecting plastic bottles in plastic bags placed in front of the gate where she sells noodles. With Mrs. J actively sorting and collecting waste properly, the surrounding environment can be kept clean. With a clean environment, the water channels can run smoothly and remain clear.

4. Conclusions

Based on our research aimed at evaluating the knowledge of the Tomang community in West Jakarta about flooding, it shows that the community's knowledge about flood prevention is quite varied. Most residents already understand the importance of maintaining water channels and managing waste, although there are still challenges in implementing preventive measures that the residents must overcome. The results indicate that while individual preventive efforts have been made, community involvement in socialization programs and education regarding flood mitigation is essential to increase residents' awareness of their role in preventing floods.

Moreover, this research also highlights the importance of collaboration between the community, government, and related institutions in sustainable environmental management and strengthening infrastructure as preventive measures. We hope that the

results of this study can serve as a basis for flood risk prevention and reduction efforts, as well as provide valuable information to the community in West Jakarta. As for our recommendation on flood risk prevention: cleaning drains, ditches or gutters around the house is a good way to avoid blockage of water channels caused by accumulated rubbish which causes flooding. Not only that, it can also prevent unpleasant odors and the emergence of disease germs, such as Dengue Fever (DHF). Cleaning up your yard by picking up fallen leaves, rubbish or debris scattered around and throwing them in the trash can also help.

Based on these findings, it is recommended that the government and related institutions increase socialization and educational programs for the younger generation about the dangers of flooding and the importance of prevention more intensively. The community should also be actively encouraged to participate in maintaining environmental cleanliness and improving local water drainage systems. In addition, the government can facilitate improvements in waste management capacity and upgrade more efficient water drainage infrastructure as a primary focus. This study also has limitations in terms of sample size, research area, and duration, which should be considered for future studies to be more comprehensive in exploring aspects of community knowledge and preparedness for flooding. Future research is expected to delve deeper into the social and economic factors influencing the level of community preparedness in facing floods.

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Author Contribution
The authors jointly designed the study, conducted interviews and observations, analyzed the data, interpreted the findings, and prepared the manuscript on flood prevention knowledge.

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