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Disaster Mitigation Based on Mosques: A Case Study of Community Experiences in Disaster-Prone Areas of Yogyakarta

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ABSTRACT

Indonesia is highly vulnerable to natural disasters, particularly earthquakes and tsunamis, which often cause significant social and physical impacts. This study aims to examine the role of mosques in disaster mitigation through a case study of community experiences in disaster-prone areas of Yogyakarta. A mixed-methods approach was employed, combining quantitative surveys and qualitative interviews. The quantitative data were collected from 204 households to assess disaster awareness, while qualitative data explored the mitigation practices centered around the mosque. The findings reveal that 94% of respondents know they live in disaster-prone areas, and 91% stated they would evacuate to the mosque during a disaster. The mosque functions as a place of worship and as a structurally resilient evacuation center equipped with disaster-related infrastructure and early warning systems. This study highlights the significant role of mosques in strengthening community preparedness and suggests that such religious-social institutions can serve as effective models for localized disaster mitigation strategies.

Keywords: *Community Preparedness; Disaster Mitigation; Evacuation; Mosque; Risk Awareness; Social Infrastructure*

1. Introduction

An earthquake with a magnitude of 6.3 on the Richter scale struck Bantul Regency, Yogyakarta Province, Indonesia, on May 27, 2006. The disaster resulted in over 5,700 fatalities and tens of thousands of injuries. In terms of infrastructure, more than 127,000 houses were destroyed, while over 451,000 others suffered various degrees of damage, leaving around 600,000 people homeless (Elnashai et al., 2007; United States Geological Survey (USGS), n.d.)In comparison, a more powerful earthquake of magnitude 8.3 occurred in the Kuril Islands, Japan, on November 15, 2006, triggering a tsunami with wave heights exceeding 20 meters in some areas. Although the tsunami caused significant damage to infrastructure, no fatalities were reported—an outcome attributed to Japan's advanced disaster mitigation systems (Lay et al., 2009). These contrasting outcomes highlight the critical importance of effective community preparedness and disaster mitigation strategies.

In Indonesia, disaster mitigation is carried out by both the government and the community. Government-led mitigation generally involves structural or engineered approaches, while community-based mitigation emerges from collective experiences and is commonly called local knowledge. These two types of mitigation are closely interconnected and should not be treated separately. The Indonesian government has recognized the importance of involving communities in disaster management, as residents possess in-depth knowledge of their environment. However, due to the unpredictable nature of disasters, communities often rely heavily on government support. Therefore, disaster management ideally involves synergy between governmental efforts and community participation—before, during, and after a disaster occurs—in order to reduce potential negative impacts.

Disaster cases in Indonesia have demonstrated that local knowledge is critical in minimizing disaster risks (Fakhriati et al., 2023; Irwansyah et al., 2024). This is evident in communities' environmental awareness and the wisdom they have developed over generations while living in disaster-prone areas. Communities often recognize early warning signs of natural hazards and adopt traditional ways to respond, which constitutes what is known as local disaster mitigation. This includes taboos or advisories intended to raise awareness and promote preparedness. The primary goal of such practices is to avoid the occurrence or escalation of disaster risks (Nopriyasman et al., 2024).

Research on disaster mitigation by Muslim communities through the use of religious facilities remains limited. Previous studies can generally be categorized into two main areas: (1) Structural mitigation, which involves planned and engineered responses to anticipated disaster risks—ranging from modern technologies such as flood barriers and early warning systems to traditional tools (Ali et al., 2021; Birsyada & Utami, 2024; Crosweller, 2022; Feng et al., 2024; Kumar et al., 2020; Kwazu & Chang-Richards, 2021; Nugraheni et al., 2022; Suarmika et al., 2022; Trejo-Rangel et al., 2023; Yang et al., 2024; Yousefi Mohammadi et al., 2024), and (2) Non-structural mitigation, which refers to local knowledge and community practices that are passed down, socialized, and internalized as strategies to reduce disaster risks (Crosweller, 2022; Fakhriati et al., 2023; Irwansyah et al., 2024; Kartikawangi, 2017; Nopriyasman et al., 2024; Noviana et al., 2023; Nugraheni et al., 2022; Osti et al., 2009; Paudel et al., 2024; Suarmika et al., 2022; Yulianto et al., 2021). However, research focusing on faith-based Muslim mitigation efforts remains underexplored. This study aims to contribute to that gap.

This research focuses on a group of Muslim residents in Bantul, Yogyakarta, Indonesia, who successfully mitigated disaster risks during the 2006 earthquake. Their neighborhood not only remained safe but also served as a temporary shelter for surrounding affected communities. These residents are members of the Toqurubba Mosque congregation, which consists of 204

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individuals. Despite living near the Opak River—a high-risk flood zone—they have not experienced serious disaster impacts, including flooding, due to their well-developed mitigation practices. This study centers on the mitigation strategies undertaken by the mosque's congregation.

The disaster preparedness of these Muslim residents in Bantul is rooted in both local knowledge and awareness of government-driven strategies. These dual sources of knowledge should not be separated in disaster response. However, not all communities are able to fully apply their mitigation knowledge due to lack of access to resources. In contrast, the Toqurubba community has succeeded in leveraging existing assets for disaster preparedness, setting them apart from surrounding communities. This study, therefore, poses three main research questions: (1) What is the level of community awareness regarding disaster risk? (2) What actions are taken by the community to build disaster resilience? (3) What strategies are collectively used to respond to disasters?

This research addresses a gap in the disaster mitigation literature, which often focuses either on government-led structural approaches or indigenous/local knowledge, without fully considering the role of religious institutions as key actors in disaster risk reduction. While prior studies emphasize engineering or social technology strategies, the role of mosques as social and spiritual centers for building resilience remains underexplored. This study offers a new perspective by examining how a community utilizes the mosque as a space for socially grounded disaster mitigation.

The study assumes that communities living in disaster-prone areas develop collective awareness that shapes mosque-based mitigation strategies through strong social ties and active use of mosque facilities for preparedness. This research not only enriches the literature on community-based disaster mitigation but also offers policy implications for integrating the role of mosques into inclusive and sustainable disaster risk reduction systems.

2. Theoretical Framework

2.1. Disaster Mitigation

Mitigation refers to the efforts made to reduce or even eliminate losses—both material and human—caused by disasters, through preparation before such events occur. This definition encompasses a broad scope and ideally involves all sectors of society in a cross-disciplinary manner (Arifin, 2019). According to Indonesian Law No. 24 of 2007 on Disaster Management, mitigation is defined as a series of efforts to minimize disaster risk and impact, including infrastructure development and enhancing public awareness and capacity to respond to disasters (Disaster Management Law, 2007).

Disaster mitigation is carried out by both government and communities (Hao & Lun, 2024). From the government's perspective, mitigation takes the form of infrastructure development, such as building roads to improve access to affected areas. It also includes the construction of public facilities—such as houses of worship—that are disaster-resistant. Such places are often perceived by communities as safe shelters, especially during events like earthquakes. The role of religious buildings as safe havens has been demonstrated in past disasters.

Community-based disaster mitigation, on the other hand, often stems from local knowledge (Hao & Lun, 2024; Yousefi Mohammadi et al., 2024). This local knowledge plays a vital role in helping communities manage and adapt to disaster-prone environments. For instance, in Aceh, local wisdom known as *smong* teaches people to run toward the hills after an earthquake, as a tsunami is likely to follow (Dewi & Sihombing, 2022). In the Baduy community, disaster mitigation against landslides is embedded in agricultural wisdom: they avoid using hoes or

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plows, creating rice paddies, or cultivating cash crops. These prohibitions help maintain soil stability. Similarly, among Merapi communities, *ilmu titen* (observational knowledge) discourages grass cutting, entering volcanic craters, or logging trees in protected areas. These taboos serve as protective measures against volcanic eruptions and related hazards, as forests help hold back hot lava flows and debris from reaching residential areas (Gunawan, 2016).

Both government-driven and community-based mitigation play vital roles in disaster management. Government mitigation is often seen as more modern and widely implemented due to its perceived efficiency and accuracy in responding to disasters. For example, in Peru, oil drilling techniques were improved to prevent oil spills, serving as a model of effective state-led mitigation. In contrast, community knowledge is sometimes dismissed as irrational or outdated. However, the Aceh tsunami case clearly demonstrated that local wisdom can significantly reduce disaster risks. Therefore, government and community mitigation strategies should work in synergy, complementing rather than undermining one another.

2.2. Religious Leaders and Disaster Awareness among Muslim Communities

Religious leaders play a crucial role in raising awareness and sensitivity among community members toward disaster threats in their surroundings, including places of worship. They often initiate disaster preparedness teams that involve mosque administrators and local residents. These leaders provide knowledge through religious sermons, training sessions, and also promote acceptance and resilience in facing the consequences of disasters (Arifin, 2019). The Islamic belief system offers guidance on how to protect property and preserve life from various forms of loss, destruction, and death caused by disasters (Hakim, 2013). This is particularly important, as loss of property may lead to long-term dependency on state support, and worse, the loss of life. Therefore, Islamic teachings that emphasize the protection of property and life should be further explored and internalized by the faithful. Muslims play an important role in uncovering and applying these teachings to develop awareness and appropriate responses to disasters, whether viewed as social phenomena or divine tests (Paramita, 2018).

Muslims often view disasters as trials that test the quality of human character, pushing individuals to become either better or worse. Disasters can also serve as warnings, urging people to improve their behavior and life choices to avoid more severe consequences, and to return to the path of goodness. Moreover, disasters may be seen as divine punishment for those who have caused harm or committed transgressions on earth. In this context, it becomes a collective human responsibility to protect themselves from disasters, not only individually but also through communal efforts (Paramita, 2018).

In anticipating disaster risks, Muslim communities rely on cultural and social capital. They regularly hold *pengajian* (religious study groups) and strengthen solidarity both within and beyond the congregation. Solidarity is most tested during disasters, as individuals may be tempted to prioritize their own survival. However, during the 2006 earthquake in Bantul, strong social bonds enabled affected communities to support one another and resolve issues collectively—even before government aid arrived. Similarly, during earthquakes in Japan, evacuees demonstrated strong solidarity, regardless of socioeconomic status. People helped one another, and no one went hungry, highlighting the critical role of solidarity in overcoming disaster-related challenges.

The emergence of such solidarity is inseparable from the influence of religious leaders who actively collaborate with various disaster-related institutions, such as neighborhood associations (RT and RW), village authorities, women's organizations (PKK), youth groups (Karang Taruna), volunteer teams (TAGANA), health centers, businesses, educational

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institutions, media outlets, disaster management agencies, search and rescue (SAR), the Red Cross (PMI), and local governments. Religious leaders hold a strategic position in fostering public awareness and engaging external stakeholders, as they are highly trusted figures in the community. Their dedication and spirit of humanitarian volunteerism make them key actors in disaster governance, particularly in mobilizing awareness and building resilient communities (Hakim, 2013).

2.3. The Mosque as a Place of Refuge in Disasters: Community Action

The mosque is a place highly regarded by Muslim communities. It serves as a central location where congregational prayers are held, making it a space designed to accommodate large numbers of worshippers. Mosques are typically built with strong structural integrity, enabling them to withstand natural forces and serve as safe gathering places. In Indonesia, mosques are often located in the heart of residential neighborhoods, allowing easy access for all members of the community (Ibrahim et al., 2024). These mosques are commonly built through community funding, though some may be privately initiated. Regardless of their origin, all mosques function similarly in terms of religious practices and social-religious activities. Their accessibility, structural resilience, and inclusiveness make them welcoming places for people from all walks of life (Toprakli & Satir, 2024).

Mosques have clearly defined organizational structures, managed by *takmir* or mosque committees—individuals entrusted by the community to oversee religious and social affairs. Beyond serving as places of worship, mosques also function as centers for social and economic activities. For instance, they often host community meetings and support the establishment of collective enterprises that benefit both the mosque and its congregants. In addition, mosques frequently organize charity programs for the poor, orphans, and marginalized groups. When disasters strike and cause destruction to homes and public infrastructure, the mosque becomes a key refuge for affected residents. It is perceived as a place of safety and protection, thus serving as an early evacuation site during emergencies (Vivita et al., 2023).

The role of the mosque in disasters can be described in several key ways:

- First, the mosque has undergone a social transformation—from a purely religious space to one that also hosts social and humanitarian functions, including disaster response and the sheltering of victims. This aligns with the Islamic principle of *ta'awun* (mutual assistance).
- Second, the mosque provides spiritual comfort. In times of crisis, many find peace and a sense of divine closeness inside the mosque, which helps reduce anxiety.
- Third, the mosque is equipped with support facilities and infrastructure, enabling it to serve as a safe shelter and an initial evacuation center during disasters.
- Fourth, the mosque is managed by trusted individuals. These leaders are known for their integrity and are confident in preparing the mosque for emergency use without discriminating among community members. This equitable treatment reinforces the mosque's role as a trusted place of refuge.
- Fifth, the mosque's location—often at the center of densely populated Muslim neighborhoods—makes it easily accessible, ensuring a quick response during emergencies.

Importantly, mosques do not discriminate based on religious affiliation in times of crisis. Non-Muslims are also welcomed and treated equally during emergencies (Kotani et al., 2023). This inclusiveness contributes to a sense of peace and solidarity during disasters. Gathering in the mosque allows survivors to support one another emotionally and psychologically. Religious lectures and sermons offer calm and reassurance, helping to prevent widespread panic. In fact,

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panic itself can become a secondary disaster, as seen during the tsunami in Bantul, where panic led to fatalities. Therefore, the mosque plays a critical role not only in immediate response but also in long-term recovery and disaster mitigation efforts.

3. Research Methodology

This study employed a mixed-methods approach, combining both qualitative and quantitative methods. The quantitative phase was conducted first to assess participants' awareness regarding their residence in disaster-prone areas. A structured questionnaire was distributed to all members of the mosque congregation to measure their disaster awareness (Denzin & Lincoln, 2018). Following the quantitative phase, the qualitative phase was conducted using purposive sampling to select informants deemed knowledgeable about the research topic. This phase aimed to explore the specific efforts made by the community to implement mosque-based disaster mitigation strategies. Unstructured questions were posed to informants, allowing for the emergence of new insights. The qualitative findings were analyzed simultaneously and presented according to the stages of mitigation identified (Creswell, 2003).

The quantitative method was used to examine residents' awareness of living in a disaster-prone environment and the actions they have taken toward disaster mitigation. A survey was conducted involving 204 households located in hazard-prone areas. Respondents were asked to complete a closed-ended questionnaire, though the format still allowed for elaborative responses. The quantitative data were presented in percentage form using tables to enhance clarity and accessibility.

Ten informants participated in the qualitative phase of this study. They included eight members of the Toqurruba Mosque congregation—six men and two women—and two mosque administrators who also serve as respected community leaders. The eight congregants selected had lived in the village for at least two generations and were active members of the mosque. The two administrators had served in their roles for over 20 years. Their dual roles—as both mosque managers and religious leaders—made them highly informed about the mosque's internal dynamics and its congregation. Additionally, they are trusted figures responsible for protecting the community from disaster risks. Their leadership in disaster-related education and preparedness initiatives is widely accepted and followed by the congregation.

Non-participant observation was conducted to uncover data that could not be obtained through interviews. This method was used to observe the concrete mitigation steps taken by residents to anticipate disaster risks. Among the most notable actions observed was the use of the mosque building as a primary shelter during emergency conditions, reflecting both its structural function and symbolic importance within the community.

Data from both quantitative and qualitative sources were analyzed and presented based on research findings. Quantitative results were used to describe levels of disaster awareness, presented in tables. Meanwhile, qualitative results illustrated the community's preparedness and the congregation's collective response in utilizing the mosque as a refuge from various disaster risks.

4. Results

4.1. The Toqurruba Mosque Congregation and Disaster Preparedness

The Toqurruba Mosque congregation consists of Javanese Muslims who reside along the banks of the Opak River in Bantul Regency, Yogyakarta. The community comprises 204 members who live in the riverbank area, which stretches to Parangtritis Beach in the southern part of Yogyakarta. In 2006, this region was struck by a devastating tsunami that claimed many

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lives. However, during that event, their area was spared from the direct impact of the tsunami, and no residents lost their lives, even though significant damage occurred. Residents took shelter in the mosque for several days, and none of them were harmed. The mosque also served as a gathering point for individuals from neighboring communities. As stated by mosque administrator W:

> *"Toqurruba Mosque was the only mosque that remained standing during the 2006 Bantul earthquake. It became a shelter for the local population." (Interview with SC)*

The Toqurruba Mosque was built within the residential area, designed with the intention of being disaster-resilient. Its open architectural layout—with no obstructing side walls—makes it easily accessible to the public. The mosque is managed by trusted administrators, appointed through generations, and serves as a model for disaster-resilient mosques. Equipped with infrastructure and complete facilities, the mosque utilizes a loudspeaker system not only for the call to prayer but also to broadcast warnings related to disasters such as tsunamis or floods. In addition, the mosque provides ample space for congregation members to seek shelter until their area is declared safe.

Beyond its religious function and administration (takmir), the mosque has also established a disaster preparedness committee. This committee is elected through a community consensus and plays an essential role in reducing the risks and impacts of disasters. The organizational structure of the mosque's disaster response team is presented in Figure 1.

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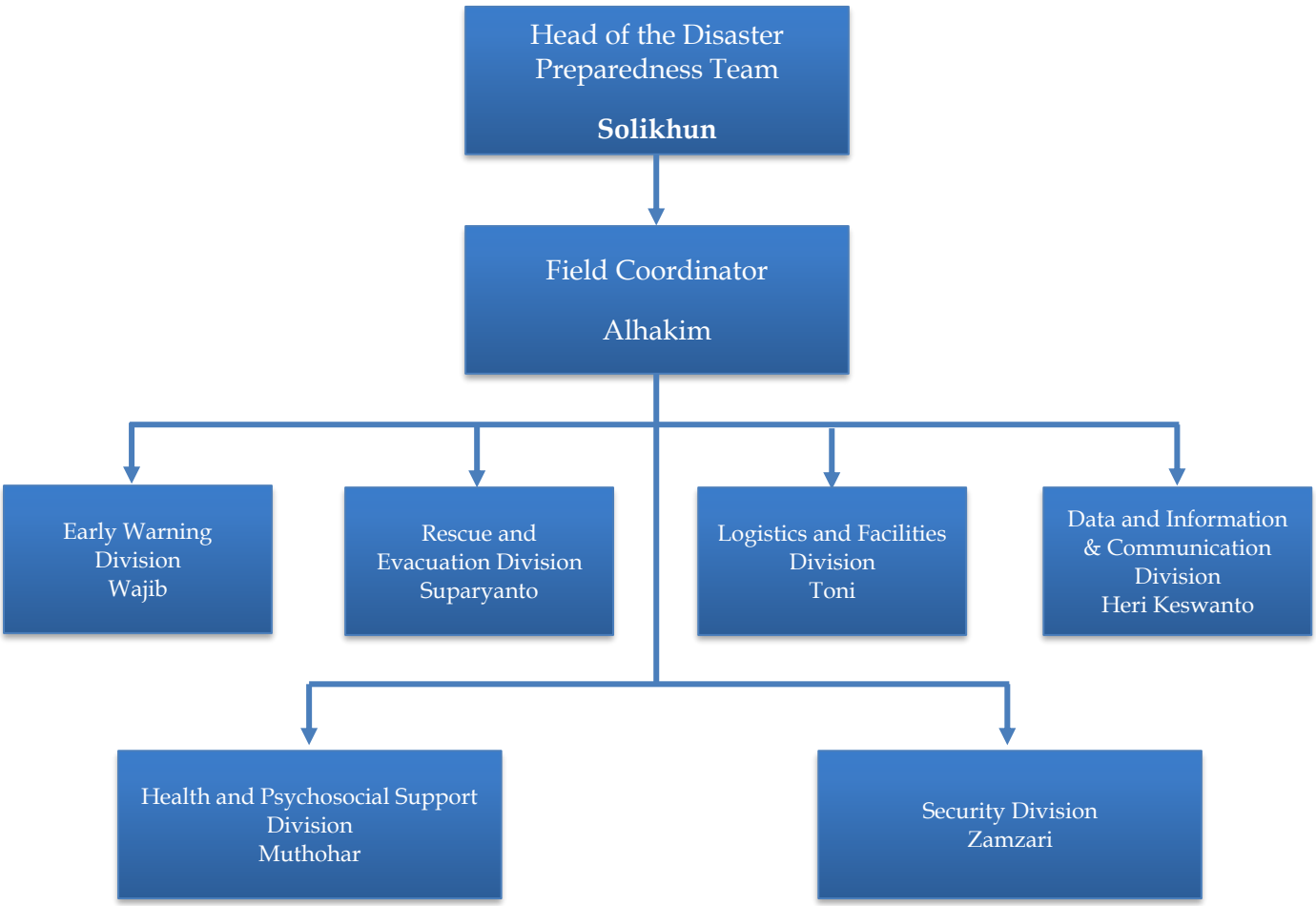

Figure 1. Toqurruba Congregation's Awareness of Disaster Risks

Source: Processed Data, 2024

Congregational activities at the mosque include regular religious study groups held weekly, monthly, and during special events such as the Islamic New Year. Other religious and social activities include the collection and distribution of zakat fitrah and zakat mal to eligible recipients. Social initiatives such as community markets are also organized to strengthen solidarity among congregants. As informant K stated:

> *"Toqurruba congregants routinely organize social activities in this mosque, such as Friday evening study groups, distributing zakat fitrah, and organizing affordable markets. These efforts are aimed at helping one another and strengthening community bonds."*
> *(Interview with WT)*

The mosque, which was established 25 years ago and continues to be managed by its mosque committee, plays a vital role in promoting social and religious solidarity. It is also open to the wider community beyond its regular members. Toqurruba Mosque has even been designated as one of the mosques responsive to disasters.

As part of its disaster preparedness, the mosque has designated a central gathering point in the open field located in front of the mosque. The area is clearly marked so congregants know where to assemble in case of an emergency. When no disaster occurs, this field is used for physical activities, such as exercise, which is viewed as an important component of

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preparedness. Running toward open spaces is considered a primary evacuation strategy. The field also serves as a site for community disaster simulations and drills. Hence, the mosque functions not only as a religious center but also as a key hub for disaster mitigation.

Table 1. Disaster Awareness among Toqurruba Mosque Congregants

Disaster Awareness Statement	Yes (%)	No (%)	Total (%)
I live in a flood- and tsunami-prone area	94	6	100
I have knowledge on how to survive a disaster	91	9	100
I will leave my house during an earthquake	91	2	100
I will go to the mosque during a disaster	90	2	100

4.2. Disaster Awareness among Toqurruba Congregants

Awareness of the vulnerability of one's living environment to disasters is a crucial aspect in fostering disaster preparedness. This study surveyed 204 residents to assess their level of awareness regarding potential disaster events. **Table 1** presents the residents' awareness of disaster risks.

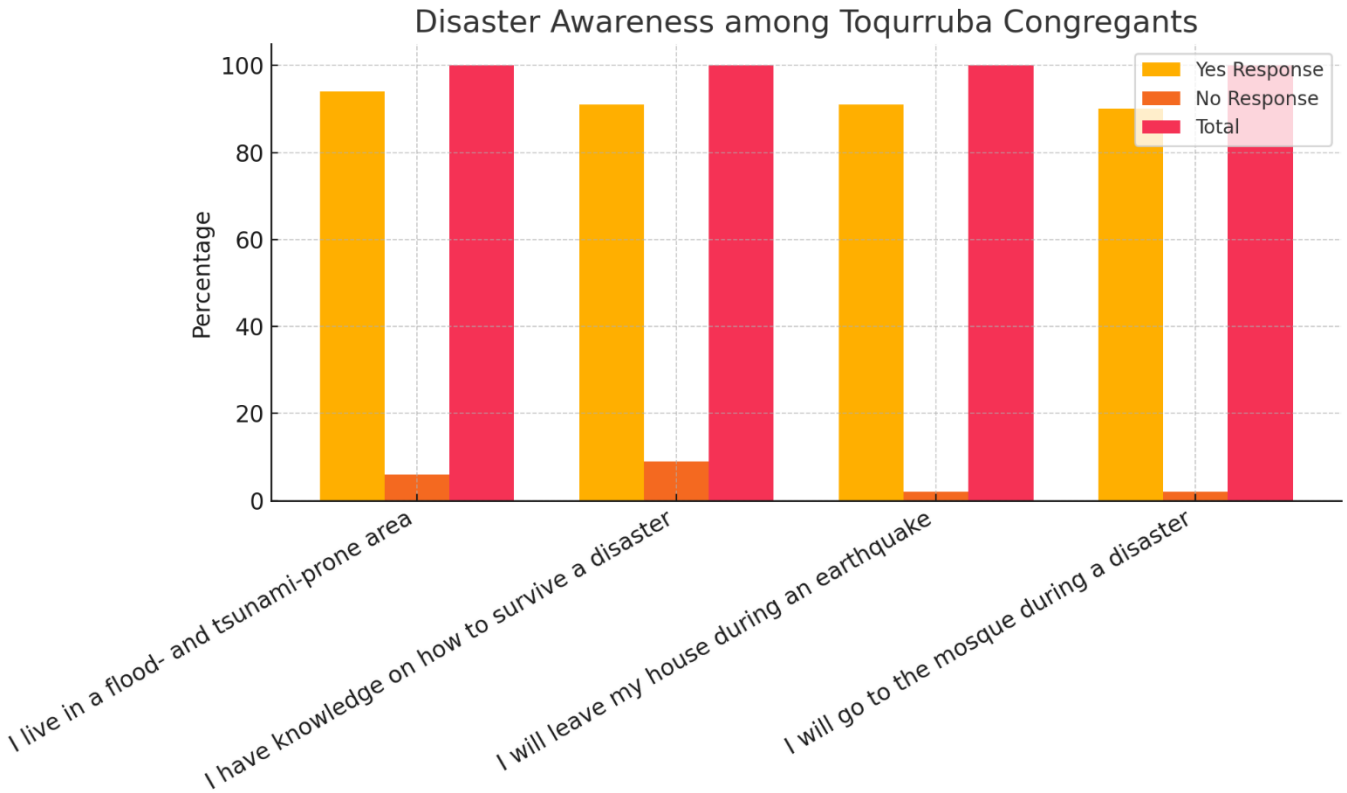

Figure 2. Disaster Awareness among Toqurruba Congregants
Source: Processed Interview Data, 2024

The table above shows that 94 percent of the Toqurruba Mosque congregants are aware that their settlement is located in a disaster-prone area, while 6 percent are unaware. This lack of awareness is likely due to the fact that some residents have never personally experienced a disaster during their time living in the area, leading them to believe that their environment is safe from floods and tsunamis.

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Additional questions were asked to determine the congregants' knowledge of what to do in the event of a disaster. The results show that 94 percent possess knowledge on how to respond. They know how to evacuate their homes during earthquakes or tsunamis, and they are also aware that the mosque serves as a designated gathering point. Moreover, they recognize that the roads in their neighborhood can function as evacuation routes in emergencies.

These findings indicate that the Toqurruba Mosque congregants have a strong understanding of their disaster-prone environment and that the existing infrastructure in their residential area can be used effectively to ensure their safety. This suggests that the Toqurruba Mosque community is a disaster-resilient congregation.

4.3. Congregational Responses to Disaster Mitigation at Toqurruba Mosque

The Toqurruba Mosque congregation is aware of the vulnerability of their residential environment to disasters. As a result, they have developed strategies to anticipate and minimize the risks of such events. **Table 2** below presents the ways in which congregants practice mosque-based disaster mitigation.

Table 2. Congregational Responses to Mosque-Based Disaster Mitigation at Toqurruba Mosque

Informant	Congregant's Response on the Role of the Mosque	Physical Aspect	Non-Physical Aspect
WT	The mosque is located in the center of our neighborhood, so whenever a disaster occurs, we immediately evacuate to the mosque.	Close to home ✓	
WT	The mosque has loudspeakers that can be used to announce an incoming disaster.	Mosque with loudspeakers ✓	
SC	Disasters won't happen in the mosque because people enter in a state of cleanliness, having performed ablution.	Clean space ✓	
SC	The water in the mosque helps calm panic and fear during disasters.	Abundant water ✓	
WR	People perform ablution when entering the mosque, so everyone is in a state of purity.	Wudu (ablution)	
WR	There is food available at the mosque, so no one will go hungry.	Plenty of food ✓	
ZU	The mosque is managed by trustworthy people; the takmir (mosque committee) is highly trusted.		Trusted committee ✓
ZL	Religious sermons held in the mosque help people avoid panic during disasters.		Sermons reduce panic ✓
MU	At the mosque, we meet fellow congregants who provide emotional support and advice to remain patient.		Mutual support ✓
YT	The mosque fosters new businesses—people not only worship but also discuss joint		Business activity ✓

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Informant	Congregant's Response on the Role of the Mosque	Physical Aspect	Non-Physical Aspect
	ventures.		
LH	There is always someone at the mosque who can act as a disaster watch person.		On-site presence ✓
WR	The mosque is always open day and night, making it easy to monitor disaster conditions.	Open 24/7 ✓	
JK	Religious teachings in the mosque include guidance on how to respond to disasters with patience.		Patience in sermons ✓

Source: Processed Data, 2024

The table above demonstrates that mosque-based mitigation efforts encompass both physical and non-physical dimensions. The physical aspects include the mosque building and its supporting facilities, while the non-physical aspects involve human resource activities and social support systems. The mosque is considered an ideal place for mitigation due to its strategic location, ease of access for congregants, and its function as a safe refuge during disasters. It is always open and never empty. The mosque's cleanliness, availability of clean water and food, and the use of loudspeakers for disseminating important information during emergencies further establish its role as a refuge.

In addition to providing physical shelter, the mosque also helps reduce panic and anxiety by facilitating social interaction, religious gatherings, and spiritual support. Congregants find strength in one another, and disaster-related knowledge is shared during religious study sessions. The mosque also fosters small-scale economic activities, such as the selling of homemade snacks among congregants. These forms of economic engagement contribute to resilience and sustainability.

For these reasons, the mosque functions as a center for local disaster mitigation—one that is considered a strategic and effective means of minimizing disaster losses and preventing future risks.

5. Discussion

Disaster mitigation within Muslim communities involves preparedness, disaster awareness, and the mosque as a place of refuge from various threats. The mosque serves as a space for religious, social, and economic activities and as a central site for disaster mitigation. Its location at the heart of the community makes it easily accessible and a natural gathering place during disasters. Moreover, mosques are managed by individuals who are trusted by the community and prioritize the mosque's welfare above personal interests, further reinforcing their role as safe havens. With facilities such as loudspeakers, clean water, and food supplies, the mosque helps reduce panic and anxiety by providing a space for communal gatherings and religious activities where people can support each other morally and spiritually.

The completeness of its infrastructure and organizational structure indicates that the mosque is disaster-resilient. According to Toprakli & Satir, a disaster-resilient mosque is not only physically equipped but also socially aligned with the needs of the community (Toprakli & Satir, 2024). Its central location and wide accessibility increase the mosque's potential as a disaster response center (Ibrahim et al., 2024). In addition, the mosque management includes a

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disaster preparedness committee, formed by the takmir (mosque board), which anticipates the possibility of future disasters—especially given the area's vulnerability to flooding.

In this context, the preparedness of the congregation demonstrates that they do not merely accept disasters passively, but actively engage in anticipatory efforts well in advance. Measures such as constructing embankments and elevating buildings to avoid floodwaters have been taken proactively. Their sensitivity to environmental risks is also evident, echoing findings from previous studies (Ali et al., 2021; Yang et al., 2024; Yulianto et al., 2021).

Mosque-based mitigation occurs not only because of the mosque's function as a refuge during disasters, but also due to its spiritual significance. The mosque is seen as a sacred and peaceful space, close to God, and managed by trusted leaders capable of guiding the community through hardship. The sense of inner peace and solidarity found in the mosque environment makes it an ideal place for collective coping (Vivita et al., 2023). Muslim communities have a strong cultural and spiritual connection to the mosque, which is inclusive, accessible, and free of social stratification. Moreover, the mosque supports not only spiritual and social needs but also economic activities, such as the sale of homemade goods among congregants. In this way, the mosque becomes a space that fosters community resilience.

This study found that mosques have played a central role in disaster evacuation, such as during the 2004 Aceh tsunami (Vivita et al., 2023). Their open structure makes them accessible and effective in reducing disaster risks. Similarly, Kotani et al. found that for many disaster survivors, the mosque was the primary place of refuge, reflecting strong cultural and religious ties (Kotani et al., 2023). While mosques are not necessarily the tallest or strongest buildings, they are trusted as protective spaces by Muslim communities (Ibrahim et al., 2024). Thus, mosques have great potential to be developed further as disaster response facilities, and their contribution to disaster management should be formally recognized. The role of mosque leaders is also essential—not only in addressing immediate needs but also in providing trauma healing through religious sermons and community engagement.

This contrasts with findings by Kotani et al. in the context of mosques in Japan during the 2011 Great East Japan Earthquake and the 2016 Kumamoto Earthquake (Kotani et al., 2023). In those cases, mosques functioned primarily as short-term distribution centers for aid—receiving donations from Muslims across Japan and distributing them to affected individuals. Although the aid included halal food for Muslim minorities, it was shared with anyone in need regardless of religion or nationality. Some mosques also served as temporary shelters, public kitchens, and accommodation for volunteers. However, their long-term roles in recovery and mitigation were limited, and religious leaders were not significantly involved in ongoing disaster education or trauma care. This was largely because mosque congregants in Japan are predominantly transient foreign students, not permanent residents. Therefore, religious leaders in that context did not play a significant role in long-term recovery or community resilience.

This study shows that local knowledge extends beyond cultural traditions to include religious teachings and mosque infrastructure, all of which are used by the community for disaster mitigation. Such community-led mitigation practices must be preserved, as local people not only understand the problems they face but also know the solutions. Accordingly, the mosque is clearly more than a space for prayer, social gatherings, and economic activity—it is also a vital space for minimizing the impact of disasters.

Thus, specific policies are needed to promote the development of disaster-resilient mosques and to provide disaster education to congregants. This will ensure that both mosques and their communities are well-prepared to face future disasters.

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6. Conclusion

Muslim communities practice disaster mitigation based on religious values. Their efforts begin with disaster preparedness, environmental awareness, and utilizing the mosque as a key site for disaster response. While the mosque is traditionally known as a place of worship for Muslims, its function has expanded significantly. It now serves not only as a religious and socio-economic center, but also as a space to minimize disaster risks. Safety, tranquility, and a sense of protection are derived from the mosque. Because it is easily accessible and provides services without reinforcing social stratification among congregants, the mosque becomes a sacred and clean space that supports disaster preparedness. Furthermore, it allows Muslim communities to remain active and creative during times of crisis. Mutual support and encouragement within the mosque stem not only from religious teachings but also from long-established communal bonds. In this way, religion has made a meaningful contribution to disaster mitigation among Muslim communities.

Given the mosque's vital role in Muslim disaster mitigation strategies, it deserves special attention from all stakeholders. Therefore, mosque buildings should be designed to be disaster-resilient, especially against hazards like tsunamis and floods. Mosques should also be equipped with infrastructure and facilities that meet the wider community's needs and help reduce disaster risks. Importantly, mosques are not exclusively for Muslims in times of crisis; they can also provide shelter to non-Muslims. This makes the mosque a highly inclusive and strategic space for disaster mitigation.

This study is limited to mosque-based mitigation efforts among Muslim communities, demonstrating both disaster-resilient congregations and disaster-resilient mosques. However, future research should also examine houses of worship from other faiths to explore whether their buildings and congregations possess similar levels of disaster resilience. Such studies would help develop a more comprehensive understanding of the role of religion in disaster mitigation across Indonesia's diverse faith communities.

7. Acknowledgment

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8. Declaration of Conflicting Interests

The author has declared no potential conflicts of interest regarding this article's research, authorship, and/or publication.

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