

An Understanding of the Informal Response, Culture, and Local Participation in Disaster Management in Indonesia from the 2018 Lombok Earthquake

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Abstract

This study aims to analyze the informal response, cultural influences, and local participation within the framework of the decentralization system in disaster management, focusing on the 2018 Lombok Earthquake in Indonesia. Conducted as an exploratory case study, Lombok in West Nusa Tenggara (NTB) Province was selected due to its significant losses from the earthquake, which triggered responses from various actors, stakeholders, and the local populace. Data were gathered through semi-structured interviews with 12 key informants and an analysis of policy documents relevant to disaster management in Indonesia. Findings reveal that governmental policies related to community empowerment played a crucial role in shaping the local response. Establishing national disaster status was deemed important to mobilize resources and coordinate efforts effectively. The study observed that local contributions significantly improved after the 2018 Lombok Earthquake, with enhanced response mechanisms and increased community participation compared to previous disasters. However, the research identified pre-existing and post-disaster conflicts within the local community, primarily due to resource allocation and differing priorities among stakeholders. Cultural memories and religious beliefs in Lombok also significantly influenced disaster mitigation and response, fostering communal solidarity and resilience. The affected local population faced severe trauma, necessitating comprehensive trauma healing initiatives to restore psychological well-being. An evaluation of the informal response highlighted both strengths and areas for improvement, emphasizing the need for better coordination and resource management. These findings underscore the critical need for strengthening local capacities, enhancing coherence between different levels of government, and integrating cultural and religious considerations into disaster management strategies to improve response efficacy and community resilience.

Keywords: informal response, disaster management, Lombok Earthquake, community resilience, cultural memory.

1. Introduction

Lombok, a small island in the middle part of Indonesia, was recently struck by large earthquakes more than hundred times. From this year's earthquake, about three big events of the calamities happened with the great magnitude around 6.4-7.0 Richter scale. The 2018 earthquake events were the highest magnitude recorded for years. The 7.0 Richter scale of the events in 2018 has caused casualties of about claimed 500 calamities. Besides, more than 390,000 people were affected, and about 73,843 houses suffered substantial damages. The conditions were also exacerbated by the damages of public facilities, such as hospitals, bridges, roads, dams, and social infrastructures causing the more massive impacts of disasters. From the foreshock in July 2018 until now, there have been more than 1000 total shocks resulting in big disasters in all areas of North Lombok and East Lombok, and part areas of West Lombok, Mataram City, Central Lombok, and South Lombok.

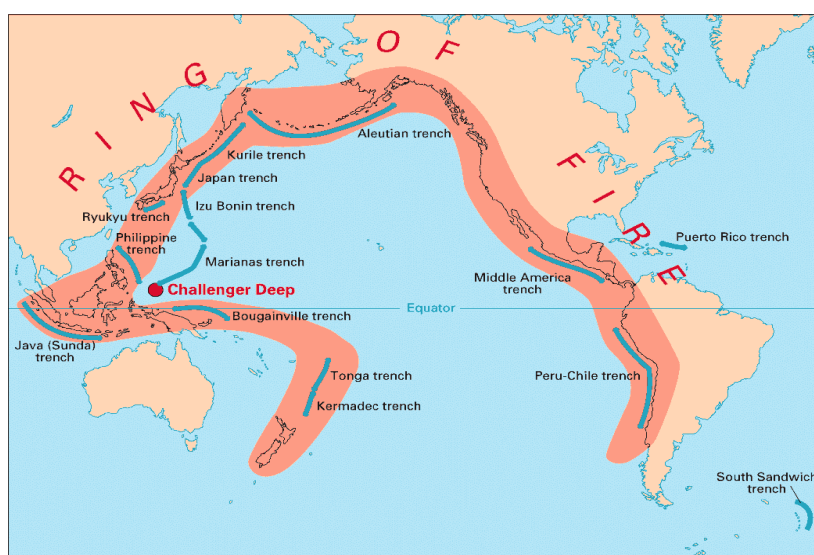


Figure 1. Volcanic arcs and oceanic trenches partly encircling the Pacific Basin form the so-called ring of fire, a zone of frequent earthquakes and volcanic eruptions.

The high severity and probability of earthquakes in Indonesia, especially in Lombok, happened as the position of this country along the so-called Ring of Fire. Consequently, Indonesia is often struck by natural hazards due to the impact of most seismically active zones and volcanoes (Figure 1). The unique position on the ring of fire leads to exposure to specific natural hazards, such as earthquakes, volcanic eruptions, and tsunamis (Lassa 2013). As a small part of the Ring of Fire, Lombok has also experienced many earthquakes since many years ago (Table 1). From Table 1, about four earthquake events have been recorded since 1979, indicating that the catastrophes did not occur frequently, but those happened by very high severity resulting in the great impacts on human life.

Table 1. Historical events of main earthquakes in Lombok

Year	Date	Magnitude (Richter Scale)	Impacts
1979	30 May 1979	6.1	29 people seriously injured, 98 minor injuries, 295 houses destroyed
2004	20 January 2004	6.2	32 people injured, more than 2000 houses and public facilities destroyed
2013	22 June 2013	5.4	30 people injured, 5286 houses damaged
2018	29 July 2018	6.4 (Fore shock)	
	5 August 2018	7.0 (Main shock)	
	19 August 2018	7.0	

Source: BNPB

As a disaster-prone country, Indonesia still experienced low capacities to respond to the calamities. Many casualties and enormous economic losses in the 2018 Lombok Earthquake happened due to the lack of preparedness, early warning systems, and even prevention on the part of many related stakeholders. It is worsened by the problems of disaster management, which still appeared during the 2018 Lombok Earthquakes. In Lombok, just after the first shock of the 2018 earthquake, several issues and adverse situations related to the practice of disaster management have just revealed.

The situation mentioned above cannot be separated from the current disaster governance system, including the role of central government and local agencies (Kusumasari 2010). Besides, the important role from the national government, local government, and other stakeholders such as NGOs, is needed for better disaster management in Indonesia (Djalante & Thomalla 2012). Many problems related to disaster governance, both in risk management and crisis management, still become important issues and often is the dilemma. Fortunately, the current regulation of disaster risk governance (DRG) in Indonesia has applied the decentralisation system in recent years (Srikandini et al. 2018). As the impact of decentralisation, the effort of local participation and community empowerment has increased significantly (Kusumasari 2012). Local people are actively involved in informal groups, local organisations, and certain community-based disaster risk reduction on village levels.

However, the study of informal response and local participation to disasters happened as the decentralisation systems in Indonesia has been limited. Some related scholars only focused their studies on social actions of community or generally analyse the governmental policy related to disasters, without bridging them. Djalante (2018) in her review article also recommend increasing the number of research projects in disaster in other locations (except Java and Sumatera) with different hazards. She also concluded that risk governance at the national, local and community level is needed to be strengthened to increase the capacity and resilience. Moreover, the study about disaster in the case study of Lombok especially in the 2018 Lombok Earthquake, both from technical and social aspects, has also been limited.

Hence, this research aims to understand the *informal response, culture, and local participation* as the products of the decentralisation system in disaster management on the 2018 Lombok Earthquake. Furthermore, to understand certain policy documents which relate to local capacity and participation,

the analysis of governmental policy, regulation, and governance are conducted. This study also investigates the informal responses in Lombok in earthquake events. Also, this research includes the analysis of positive and negative externalities of informal responses.

2. Methods

This study mostly relies on primary research in the case study area with a qualitative approach. The qualitative research is mainly the exploratory study, which is applied to reach an understanding of reasons, opinions, and motivations (DeFranzo 2011, www.snapsurveys.com, accessed 15 November 2018). In this research, we provide further narratives from findings during fieldwork, leading me to choose the qualitative research. Stallings (2007) explained that scholars from disaster studies often use several research methods such as field research, survey research and documentary research. In this research, we use the possible methods of data collection, such as (1) desk study to review and analyse the policy documents, global norms, political changes and the situation of disaster management in decentralisation system; (2) semi-structured interviews among related stakeholders.

A desk study was conducted to analyse certain documents such as governmental law, global law, certain regulations from agencies, historical information, and current literature. The contents, articles, and parts selected are the statements about informal responses, decentralisation, and local participation on DRR. Field research, in this study, was done by conducting semi-structured interviews. One interview activity took around half to one hour of conversation. There are a total of 12 interviewees coming from various backgrounds. In the first activities of field research, we asked general questions to the interviewees, and they answered as their knowledge have (Table 2).

Table 2. Data collection from interviews

Descriptions	
General Questions	<ol style="list-style-type: none"> 1. How about the situation of governmental policy related to the community empowerment in Lombok Earthquake? Is it important to establish the national disaster status? 2. How about the local contribution after the 2018 Lombok Earthquake? Is there any improvement of response and local participation compared to previous disasters? 3. What are the conflicts happened in local community before and after the 2018 Lombok Earthquake? 4. What cultural memories embedded in Lombok regarding the earthquake? How religion and beliefs contribute to mitigate and respond the earthquake? 5. How about the situation of local people affected to earthquake? How to conduct trauma healing among them? 6. What evaluation of informal response in Lombok regarding to the 2018 Lombok Earthquake?
Steps and Procedures	This part applied semi-structured interviews about 1-2 hours for one interview. During the interview, recorders were used to save all information that interviews deliver.
Data Collected	<ul style="list-style-type: none"> • Disaster policy and governance (BNPB and BPBD role, central government and local government, national disaster status, disaster and politics)

Descriptions	
	<ul style="list-style-type: none"> • Responses (from NGOs, volunteer, youth participation) • Local participation among citizens (local people responses, religious and missionary, social capital and local wisdom, and trauma healing) • Cultural memories • Condition among local people after disaster (susceptibility, conflict, demonstration, casualties and material losses, media blow up and hoax, people's knowledge, trauma)
Interviewed Actors	<ul style="list-style-type: none"> • 2 expert interviews (disaster consultant, disaster expert from Gadjah Mada University) • 1 head officer of national disaster management board from Nahdlatul Ulama (Islamic organisation) • 9 representatives of local people (North Lombok, West Lombok, Mataram, East Lombok, and Central Lombok)

3. Results and Discussion

3.1. General Background of Case Study

This research was conducted in Lombok, Nusa Tenggara Barat (NTB) Province, Indonesia (Figure 2). Lombok is the westernmost island in NTB Province spanning around 4,738.65 km², located in the southeast part of Indonesia. Lombok Island has 5 Cities and Districts, including West Lombok, Central Lombok, East Lombok, North Lombok, and Mataram City. The study area extends between 8° 12' 39.33" S to 8° 57' 22.248" S and 115° 49' 15.3804" E to 116° 43' 39.6984" E. As a small island, Lombok is surrounded by the sea. Based on Figure 1, to the west is Lombok Strait and the eastern part is Alas Strait, the northern part is the Bali Sea, while on the southern part lies the Indian Ocean.

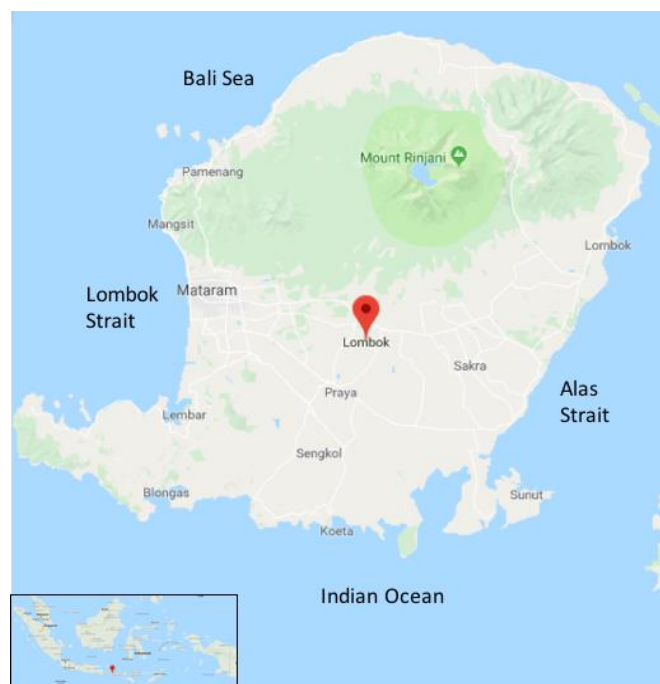


Figure 2. The map of Study Area

Lombok is dominated by a mountain area in the northern part, called Mount Rinjani, which is regarded as the second highest volcano in Indonesia (3,726 meters above sea level). That mount has still been active until now, with the last eruption occurring in September 2016. In a 2010 eruption, ash was reported as rising 2 kilometres (1.2 miles) into the atmosphere from the Barujari cone in Rinjani's caldera lake of Segara Anak. Mount Rinjani National Park has established the volcano including the crater lake, Segara Anak in 1997. Many years ago, in 1257, there was the Samalas eruption in Lombok, recorded as one of the most massive volcanic eruptions in history, causing global changes in the weather.

Similar with the seasons in Indonesia, Lombok has only two kinds of season: dry seasons and wet seasons. Lombok has a lot of mountains and large forest areas in several places that are categorised as tropical rainforests. This forest is enriched by the biodiversity and the areas that have vital functions as water savings during high rainfalls. Different from the highlands that are covered by forest and mostly undeveloped, the lowland areas in Lombok are highly cultivated. Many areas in Lombok, especially the southern region, are classified as arid areas that are vulnerable to water scarcity. This is also exacerbated by the low rainfalls and lack of water sources.

3.2. Earthquake Timeline

Since the first shock that was followed by hundreds of aftershocks, around three main shocks were recorded. Those calamities are noted as being of bigger magnitudes than other shocks, more than six on the Richter Scale (Figure 3). Those earthquakes will be listed below.

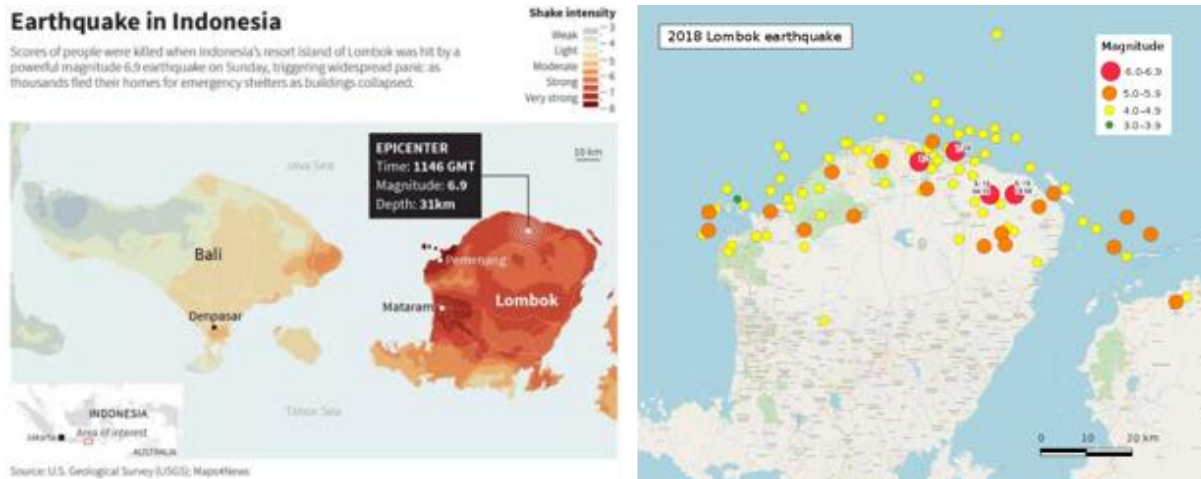


Figure 3. The location of earthquakes in Lombok (foreshocks and mainshocks)

29 July 2018

The first earthquake in July 2019 impacted Lombok by the magnitude 6.4 on the Richter Scale, caused by the Flores Back Arc Thrust. That earthquake was situated on the coordinate of 8.4 S and 116.5 E, estimating located along the land areas around 47 km in the northeast of Mataram City, 24 km in depth. That earthquake was followed by many other shocks that resulted in many areas such as North Lombok, West Lombok, East Lombok, Mataram, and Central Lombok. Besides, several places also felt the shocks, including Sumbawa, Denpasar, Kuta, and Nusa Dua.

5 August 2018

After a week since the first shock happened, another big earthquake struck. On 5 August 2018, Lombok was struck by an earthquake of magnitude 7.0 on the Richter Scale at 18:46:35 local time. The earthquake was located on the coordinate of 8.37 S and 116.48 E, around 18 km from northwest of East Lombok, 15 km in depth.

19 August 2018

The quakes have not stopped yet. On 19 August 2018, another big shock happened. An Earthquake of magnitude 7.0 on the Richter Scale occurred at 21:56 local time, which was also followed by many other shocks. The earthquake was located 30 km from Northeast of East Lombok. This shock was felt in all areas of NTB, East Nusa Tenggara (NTT), Bali and South Sulawesi. This Earthquake has resulted in many fatalities and material losses.

3.3. Informal Response from NGOs and Organization

The role of NGOs, business entities and organisation in the activities of disaster management are also clearly noted in certain regulations in Indonesia and internationally. As stated in Head Regulation of BNPB No. 23, 2010: community organisations, religious organisations and mass media in the disaster event can conduct the community fund collection and management for disaster relief assistance and must submit licenses to social ministries, governors, regents/ mayors with copies to

BNPB/ BPBD. It is also similar to the Sendai Framework which explained the importance to improve collaboration among actors at the local level to spread disaster risk information through the involvement of community-based organisations and NGOs. Furthermore, in Head Regulation of BNPB No. 12, 2014, Article 4, several activities that can be carried out by business entities include introduction and monitoring of disaster risk; disaster management participatory planning; and development of disaster awareness culture. They also enable to organising, installing, and testing early warning systems; organising, counselling, training, and rehearsing emergency response mechanisms; dissemination of information about disaster warnings for preparing evacuation routes; and other activities to reduce or eliminate disaster risk.

As the following comment by a research participant explains, the role of NGO and business entities are significant to increase resilience among local people in such a disaster-prone village:

I look at the differences from the villages that have interventions and other villages that do not have interventions from NGOs and business entities. For example, the villages that have intervention from such NGOs and business entities are very innovative. Policy innovation is not good enough to educate the public about DRR. Innovation needs something that every executor has the capacity. (Interview with disaster risk expert, 16 October 2018).

After disasters happened in Lombok, many NGOs, business entities, and organisation came to the areas to help the victims. For example, one interviewee said that the temporary shelters came from private institutions such as *Muhammadiyah* Disaster Management Centre (MDMC) and Let's ACT Indonesia (ACT) (Figure 4). Besides, other interviewees also told that many other organisations also came to Lombok to help as their expertise, including *Nahdlatul Ulama*-Care, Mercy Corps, several multi-national companies, and other related organisations.



Figure 4. The tent provided by Muhammadiyah Disaster Management Centre (MDMC) in Lombok

(source: menara62.com)

3.4. Local Response from Volunteers and Helpers to Respond to the Disasters

We also consider that human resources are badly needed in the responses of disasters which are shown as the presence of numerous volunteers. In Lombok, many volunteers came from various institutions, different provinces in Indonesia; even there are foreign volunteers. Often, there were also volunteers from individual willingness. They are not involved in such active organisations. Fortunately, in the implementation, they worked together with the voluntary organisations. BNPB, from the regulation No. 17, 2011, explained the guide for disaster volunteers that the role of volunteers could be implemented before, during, and after disaster. During emergency response, volunteers can help in certain activities, such as rapid assessment of the coverage of the affected area, number of victims and damage, resource needs, availability of resources and predictions of the development. Besides, volunteers could also do the technical things, including search, rescue and evacuate residents of the affected community; provision of public kitchens and shelters; and provide clean water, clothing, food and health services including environmental health. Besides, the activities of volunteers may relate to social, cultural and religious events; protection of vulnerable groups; and psychosocial assistance among disaster victims. In post-disaster situations, volunteers can assist in data collection and processing of damage and losses in the housing, infrastructure, social, economic and cross-sector sectors. Volunteers can also participate in physical and non-physical rehabilitation-reconstruction activities in the early recovery period.



Figure 5. One of the activities among volunteers during the response in Lombok (source: medianasional.id)

Besides the response activities, volunteers also have the role related to disaster risk management (see Figure 5). During the situation without any potency of disasters, volunteers could also organise the training among local people and provide the information to increase public awareness in the context of DRR. In situations where there is potential for disaster, volunteers can play a role in certain activities. The main activity is preparedness, including: Monitoring the development of threats and vulnerabilities of the community; counselling and training on disaster emergency response mechanisms; Provision and preparation of supply goods to fulfil basic needs; Provision and preparation of materials, goods, and equipment to fulfil the recovery of infrastructure and facilities; and reparation of evacuation sites. Furthermore, the early warning systems are also

essential to be applied at the community level.

In Lombok, the role of volunteers is also seen in many aspects. An interviewee told me that the volunteers who provide logistical assistance are initially from local communities, campus alumni, NGOs such as *Muhammadiyah* and *Nahdlatul Ulama* (religious organisations). In the emergency response phase, some organisations sent doctors, as well as built the health clinics in places that were quite strategic to reach. *Muhammadiyah* and their volunteers also helped a lot in the rebuilding of houses. They helped make temporary housing.

Besides, international volunteers also joined in helping the victims in Lombok as an interviewee said that many foreigners also come to Lombok to help in the medical activities and injuries. The interviewee also said that there are no restrictions on foreigners coming to Lombok; the government is open to those who intend to help, which is essential according to the procedure.

The crucial issue during the disaster responses in Lombok is that many children are suffering the trauma. Trauma healing activities were conducted to decrease children's adverse situation (see Figure 6) as informed by an interviewee that the trauma healing activities were aimed at the children. Children were given activities such as competitions and singing songs.



Figure 6. Trauma healing for children in Lombok by telling stories and conducting the interactive games

(source: *Tribunnews.com*)

3.5. Informal Actions from Local People

Local people also responded positively /actively. Although they suffered the quakes, they even tried to cope with the adverse situation by doing the informal activities. As the story told by one of interviewees, civil society from communities provided food and logistics. Local people provided the aid and logistics to the centre (main shelters regulated by the government). Since several weeks after quakes happened, people have also returned to their respective jobs. Furthermore, one local participant in my research also explained that after the earthquake, local people also established the vegetable village using plastic waste by the assistance from expert volunteers in agriculture. By those activities, the economic situation is helped, the environment is cleaned, and they can be

psychologically helped from the worse trauma of the disaster.

However, the responses from local people were often hampered by their current situations (both physical, social, and economic vulnerability). Several participants in this research told me about their conditions. One of them revealed that many young people had not been trained to deal with disaster conditions, so there were no capable actions. All are victims, and no one acted. Even the village government did not respond to anything. Another respondent said that local people generally have no experience that the area is vulnerable to disasters. When the disaster happened, they did not know what to do to save themselves and what actions after the earthquake came.

3.6. Religion and Disasters

In many disaster-vulnerable countries in the world, including Indonesia, religion is indeed embedded and implemented among local people in their livelihood and has been integrated with their culture and local wisdom (Sun et al. 2017). The previous study conducted by Merli (2005) discovered the Muslim and Buddhist religious groups explain the disaster based on their perceptions. In the occurrence of the 2004 Indian Ocean Tsunami, many ideas regarding the religious perceptions revealed, such as tsunami happened as divine retribution, karma, and as a form of purification or cleansing of sinful places.

Lombok also has robust activities in religious things, proven by the local responses from citizens related to religion and beliefs. Positively, religious beliefs could improve the disaster awareness of religious believers and bring their disaster response. Furthermore, religious identity can generate, mobilise and transform into the needed support and resources for believers to cope with disaster (Sun et al. 2017). Besides, beliefs act as a bridge between human beings and their living environment, which also shape how local people perceive disasters.

Religion can strengthen society but can make them surrender. First, people who have the belief that they must keep trying under any circumstances, are not resigned. (Interview with a male local person in Central Lombok, working as a researcher, 7 October 2018).

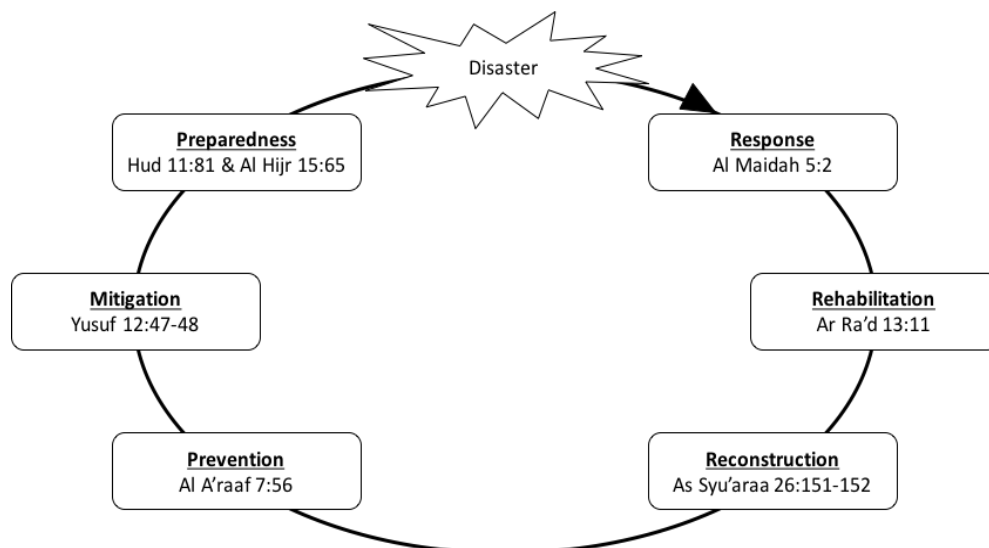


Figure 7. Disaster management cycle from Islam (Moslem) perspective: based on what have been written in

Holy Qur'an (Syadzili 2007).

As an example, in Islam perspective (Figure 7), disaster management cycle both preventive and curative aspects could be seen from certain verses in the Holy Qur'an. Every step of disaster management has such guidance for everyone who believes in Islam. Indeed, Islam has explained for people to see the disasters and adverse events as the way to rise and survive. However, the rest of their efforts, people must consider the presence of God by surrendering and keep praying. In the Holy Qur'an, Who, when disaster strikes them, say, "Indeed we belong to Allah (God), and indeed to Him, we will return." (Al Baqarah 2:156).

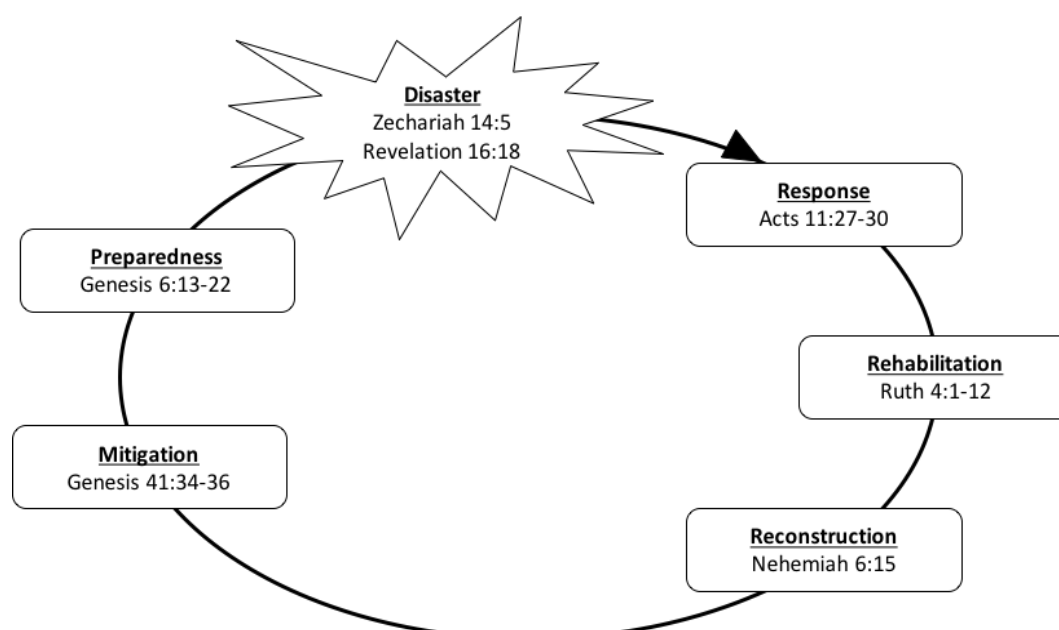


Figure 8. Disaster management cycle from Christian interpretation (Davis & Wall 1992)

Besides Islam, Christian people also have the interpretation in disaster management based on their beliefs in the gospel (Figure 8). There is also guidance for all phases of disaster management cycle based on the holy book that Christian belief. According to Kay et al. (2010), religious belief is possible representing the means of affirming the type of personal control. Moreover, certain verses in the Gospel revealed that religion could contribute to recovery the psycho-social life among the victims in the aftermath of calamities (Clarke et al. 2010). Besides, religion can also enhance happiness and resilience and contribute to such trauma healing (Chan 2012).

Several interviewees also agreed that many activities related to religious actions were conducted just after the 2018 Lombok Earthquake happened. A research participant informed us that Buddhist communities held an event to repel reinforcements to the beach to pray. Hinduism also does the same thing. For Muslims, every Friday night, they do *Zikir* (praying together), *Yasinan* (reciting from the Qur'an together), even they may pray every night. We also have many Muslim rituals, days 3, 7, 40 (after a person passed away). We are Islamic community from *Nahdlatul Wathan, Muhammadiyah*, and NU. They believe that people should return to God after the disaster. Another person said that the Hindu community conducted more prayers after disasters as an unfortunate and

disastrous event. Near my house, there are temples that they use to worship. They buy offerings, and then they pray, use incense, and sometimes their offerings are placed near the road. They also sound traditional instruments as a sign of earthquakes and other calamities. However, among many residents in Lombok, religious understanding makes them resigned. From my closest family, they surrendered after the earthquake happened repeatedly.

Moreover, study conducted by Cheema (2014), which examines the role of the mosque in the Pakistan Earthquake during response, relief, recovery, reconstruction, and rehabilitation, has proven the similar importance of such religious places. The findings explain that mosques have multi-faceted contribution in cultural, economic, social and political aspects of lives among disaster affected communities. Cheema (2014) also listed certain roles of mosque when disaster happened (especially during response), including initial contact point, a space for response and relief coordination, recruiting of volunteers, spiritual supports, and central point for providing information to the community. The findings then call the synergy building between secular and religious activities in term of DRR and post-disaster response and recovery.

3.7. Social Capital and Cultural Memory

Disaster, social life and culture cannot be separated. As previous research conducted, many disasters (flood, earthquake, landslides, tsunami) happened due to the loss of cultural heritage and social aspects. Many local cultural heritages in Indonesia serve essential roles in preserving local identity, local knowledge, and local experiences to deal with such calamities. Those aspects could also trigger the social life among neighbours to help each other in every situation. Based on Mathbor (2007), social capital as part of social life enables people to create networks, contacts, social cohesion, interaction and solidarity. Social capital is often closely related to the spirit of togetherness, local knowledge, local wisdom, and religious values.



Figure 9. Some examples of awig-awig as cultural guidance (rewritten by local government in West Nusa

Tenggara) (source: BAKESBANGPOLDAGRI NTB)

Furthermore, local cultures often serve as a source of resilience to communities. For example, in Lombok (West Nusa Tenggara), local people have such cultural guidance so called as *awig-awig* in their interaction with the living environment (Figure 9).

Make sure the use of traditional and indigenous knowledge and practices, as appropriate, to complement scientific knowledge in disaster risk assessment and the implementation of policies, strategies, plans and programmes of specific sectors, with a cross-sectoral approach, which should be tailored to localities and the context. (Sendai Framework 2015-2030).

The certain cultural heritages embedded among local people in Lombok have led them to do such actions related to the responses of the earthquake. A participant in the research informed me that people help each other, even though from different regions they come to North Lombok to help. Cooperation at the community level is still very high. People also help each other when building a house. Furthermore, another interviewee explained that local people in North Lombok in the Bayan (one of cultural heritage village in Lombok) is the source of the civilisation of the people in Lombok (the original tribe there). They still care for their local wisdom. They still maintain traditional houses. None of these conventional houses was damaged during the 2018 earthquake because they were made of bamboo and other safe materials.

Local responses that people conducted often related to the cultural memory of disasters they experienced. cultural memory often brings back the time of the mythical origins. Cultural memory has many benefits, especially for local people living in disaster-prone areas. It is also written in the Sendai Framework, as one of the forms of cultural memories, noted that older people have years of knowledge, wisdom and skills, which are invaluable assets to decrease the impacts of disaster risk, and they should be actively involved in the design of policies, plans and mechanisms, including for early warning.

Similar with other regions in Indonesia, Local people in Lombok are also familiar with certain forms of cultural memories (Table 3).

Table 3. *The manifestations of cultural memory in Lombok (related to earthquake disaster)*

Forms of cultural memory	Tangible/Intangible	Current situations (based on findings)
Newspaper articles	Tangible	Previous disasters were written and recorded in newspapers both in digital versions and printed papers. However, the archives are limited to the recent years. Disasters happened before 2000 are difficult to see in such newspapers.
Photos	Tangible	Photos and (videos) of disasters happened in Lombok are available in internet, BNPB and BPBD archives, and private ownerships, but are very limited due to unavailability of technology before these recent years.
Monuments and memorials	Tangible	Government in Lombok built some monuments and memorials when catastrophes happened. Unfortunately, many local people do not consider these as important things. During the research, I found one monument of disaster happened in Lombok in 1979 signed by Mr. President Soeharto. Others were not found yet.
Heritage houses	Tangible	Traditional houses are presented as the way to mitigate the disasters. We can see from the materials of houses, their locations and directions, and many

Stories/myths	Intangible	things in the houses. Myths are abundant. Local stories about previous disasters are handed down through generation to generation.
Performing arts	Intangible	Songs about disaster mitigation are famous among children.
Traditions and rituals	Intangible	The tradition and rituals from local people in Lombok, especially from Buddhism and Hindu people are usually done as the way to express their respond to such calamities. Besides, Moslem rituals are also numerous.
Social practices	Intangible	Presented from local wisdom and social capital among citizens, such as <i>gotong royong</i> (working together to clean their living environment voluntarily).

Note: the results obtained from interviews and local documents in Lombok.

As an example of cultural memory is the presence of *Sasak* tradition in Lombok. Due to the experiences of many kinds of disasters a long time ago, local people have responded by establishing traditional houses and preserving local wisdom (Figure 10). A female participant of the research explained to me that the *Sasak* traditional house is one proof of cultural heritage that can withstand the earthquake. In the Bayan area, the traditional house still exists although many shocks happened. Another interviewee also informed me, in Bayan, one of the traditional places in Lombok, there are more traditional houses that still use bamboo walls. It's much safer than other places due to an earthquake. Many traditional houses are found in far distances from city areas. In the city, we are no longer use the conventional house to live; local people have *Berugak* in front of the house (a kind of bungalow or gazebo). During the earthquake, many houses were destroyed, but the *Berugak* was not destroyed.

Furthermore, another story told by a local person in Lombok that each traditional house also has a rice barn, namely rice storage (Figure 11). The customs have applied that the crops from their agricultural fields are stored in the rice barns. It should not be eaten if there are no traditional ceremonies, natural disasters, or famine. Actually, in the past, it was arranged in such a way that if a disaster happened, people would not experience hunger.



Figure 10. Traditional house in Lombok (source: author)



DENGAN RAHMAT TUHAN YANG MAHA ESA
 PEMERINTAH KEPRESIDENAN RI DAN LEMBAGA DILAT DAN RANGKUN UTARA
 HARI KEMERDEKAAN KEMERDEKAAN RI 2008
 BOENHARTO
 PRESIDEN KEPRESIDENAN RI
 BOENHARTO
 PADA TAHUN 27 FEBRUARI 2008

Yogyakarta, 27-29 Agustus 2024

Together with tangible memory, local people in Lombok also know the non-tangible cultural memory, presented from many forms of cultural activities and arts. One of the popular memories easy to be delivered is the song. Based on the information from local people in Lombok, there is a song as a response to the 2018 Lombok earthquake. The title of the song is "*Tinjom kembelas*" means "shocked (due to the earthquakes)". The song was introduced by Rama Citronella (a youth in Lombok) just after quakes happened.

The fact is, even though it has amusing lyrics, the purpose of the creation of the *Tinjom kembelas* song is indeed not just a fun event. The *Tinjom kembelas* song was also created so that the people of Lombok are not so sad to the calamities and the most critical point to be shown by the song is how to make Lombok people stay relaxed and cheerful even though they are still in an atmosphere of fear of being hit by an earthquake. This can be seen in the uploading of the video song *Tinjom kembelas* on YouTube, the creator of the song embedding the Lombok Bangkit hashtag (#*LombokBangkit*) as evidence that the greatest hope the songwriter tries to achieve is how the Lombok people can recover as soon as possible with all the trauma they have. (Pratiwi 2018, ide-kreatif.kampung-media.com, accessed 2 December 2018).

Besides, the cultural stories and myths are still available and handed down from generation to generation regarding the earthquake narration in Lombok. A participant of my research told me that (some people also think) earthquakes occur as a result of disobedience, such as throwing away babies, free sex, and doing things that against the moral and culture. Another interviewee told that if an earthquake has occurred, the community thinks it is a dragon that stretches. People also often say earthquakes are the moving tails of dragons. Or often they consider the earthquake as Mount Rinjani coughing.

4. Discussion and Limitation

The nexus between capabilities, public policy, and informal response often created the complicated situations. According to Kusumasari et al. (2010), local government is commonly unable to solve the problems related to the disaster management in such area and is substituted for by certain agencies, such as citizens' association, and agencies from the national level. Another real issue is the lack of coordination and collaboration between different levels of government. Furthermore, the issues such as low budget and limited resources also happened among local government, including in Lombok. Besides, government policy focused on community enhancement often unable to create robust regulations. For example, certain laws cannot explain specific issues (such as the status of national disaster). In the Law, No. 24, 2007 there is no clear explanation about how to determine disaster status.

Keep in mind that several earthquake and tsunami prone countries, such as Japan, have applied prevention, spatial solution, and emergency management to address the earthquake risk (Greer 2012). Utilising the directive approach, central governments of Japan have major responsibilities in mitigation and recovery, supported by Japanese prefectures and local agencies. Those actions are seriously carried out to reduce the impact of future disasters both from casualties, and material and economic losses amount. The similar ways are also implemented by natural disaster

vulnerable country such as Cuba, which prepares and plans for disaster hazard in the political and economic life among the country, including national and local level (Bermejo 2006). United Nations (UN) officials pointed Cuba out as the model of disaster preparedness among developing countries in the world. However, Indonesia still suffers the adverse situations from calamities resulting in high casualties, material and economic losses.

Finally, although this study contains certain limitations, the contribution of its results offers novelty for future disaster studies. It is similar to the study conducted by Kusumasari (2012) that the corporation of social capital and cultural behaviour as local participation could encourage the distribution of assistance and local government to be more responsive to the needs among local people. Informal response and local participation, somehow, cannot take all responsibilities among the problems in disaster management. But in practice, those responses were effective, especially in the case study of the 2018 Lombok Earthquake.

5. Conclusion and Recommendation

The nexus between capabilities, public policy, informal response, and cultural memory as a conceptual framework has been successfully implemented. The main conclusion of the research is that the informal responses and local participation among citizens in Lombok have increased the resilience and local capacity to respond to the disasters. Furthermore, this thesis also concludes essential findings of the development of policy documents which guide the community participation, the current informal response among local people in the 2018 Lombok Earthquake, and the analysis of both benefits and downsides of informal responses among citizens to better management in the future.

Several major disasters that happened in Indonesia have triggered change and development of policy as well as opened the window of opportunity for empowering and strengthening the laws and regulations of catastrophe. The changes and developments have also developed the disaster risk governance and management in Indonesia to encourage the role of national and local level parties which cannot be separated from the practice of decentralisation in Indonesia. However, decentralisation in handling disasters in Indonesia often creates tension between local and national governments due to the instability of the systems, lack of capacity among stakeholders, and other related problems.

From this study, we found that the responses to the 2018 Lombok Earthquake from various stakeholders and activities have been massively made. It is showed from the situation after disasters occurred in Lombok, many NGOs, business entities, and organisations came to the areas to help the victims. Besides, many volunteers came from various institutions, different provinces in Indonesia; there are foreign volunteers from other countries to help the victims, including trauma healing activities. Although local people suffered the quakes, they tried to cope with the adverse situation by carrying out informal activities.

My research also found that the informal responses among local people in Lombok have specific benefits to enhance the better disaster mitigation and response. Communities with robust social capital could recover and build back to their resilience faster than local people with low social

capital. Informal response and local participation are also believed as the solution to reduce the funds needed for response & recovery from governments. Hence the money could be used for other requirements.

The findings of this study lead to several recommendations. The increase of communication and coordination between stakeholders enable a decrease in tension between local and national governments, including the other actors related to disaster management. Besides, the sustainability of disaster management activities in each village needs to be strengthened by maximising budget and human resources. It is also related to the recommendation from my interviewees in Lombok, that the training for policymakers such as cadets, village heads, must also be improved, primarily associated with disaster response. Also, socialisation from BNPB and BPBD should be further, and community preparedness needs to be strengthened.

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