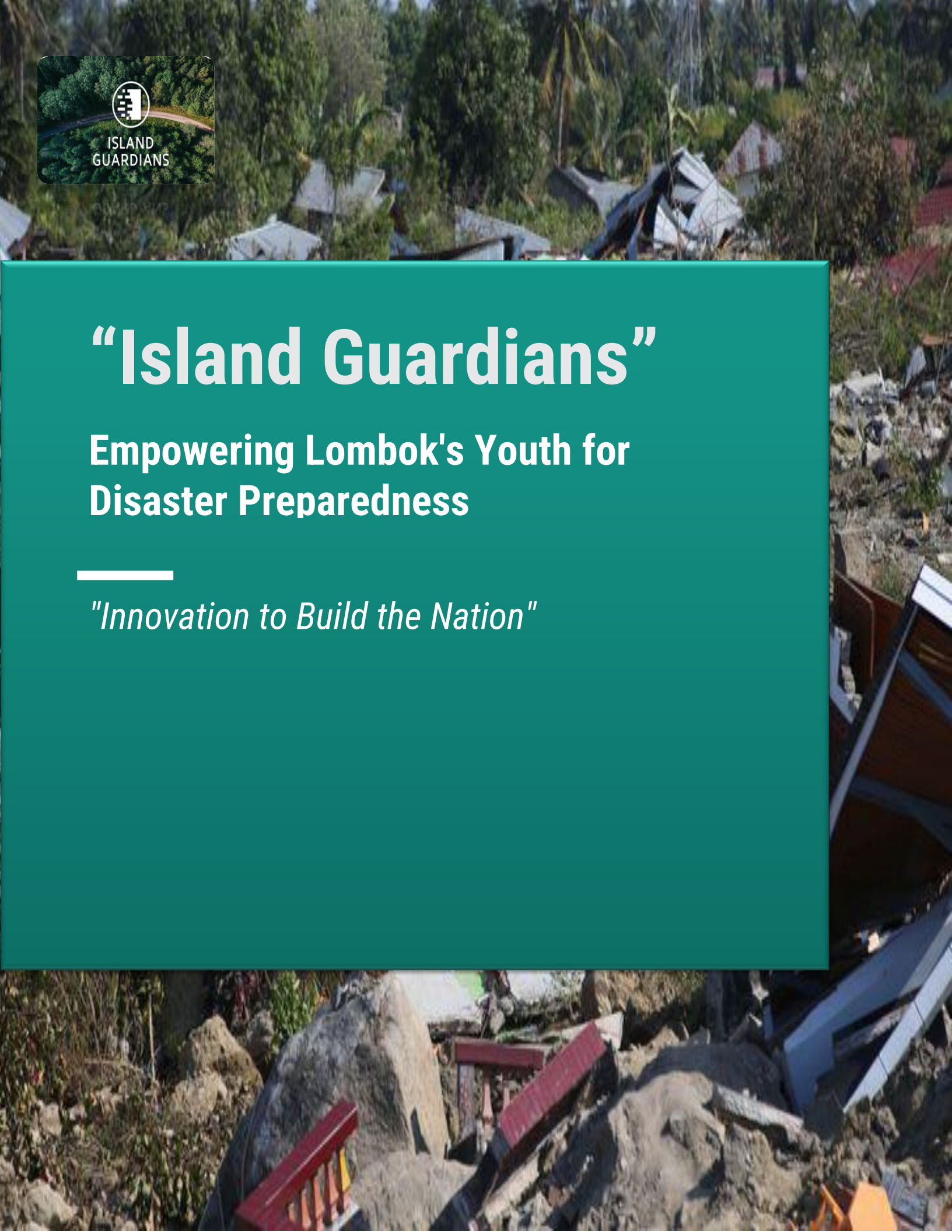


# “Island Guardians”

## Empowering Lombok's Youth for Disaster Preparedness

*"Innovation to Build the Nation"*

# Abstract/Project Summary:

*The magnitude 6.9 earthquake that struck Lombok, Indonesia, in August 2018 resulted in significant casualties, injuries, and displacement, while severely damaging over 600 educational facilities and disrupting the education of thousands. Situated in a seismic hotspot, Lombok faces ongoing challenges in disaster preparedness and educating its population on effective evacuation procedures. To address these challenges, the "Island Guardians" initiative proposes enhancing community resilience through collaborative efforts among local governments, residents, youth, industries, and NGOs. Central to this initiative is empowering the younger generation through comprehensive disaster preparedness training. Partnering with three strategically selected schools as primary training hubs, "Island Guardians" will implement a rigorous four-month pilot phase.*

*During this phase, local government agencies will collaborate closely with schools to develop and refine disaster preparedness programs tailored to local needs. The goal is to cultivate a resilient school-based community capable of effective disaster response. This approach not only strengthens immediate response capabilities but also fosters a culture of proactive disaster management and long-term resilience among students, educators, and community members. By integrating disaster preparedness into school curriculum and engaging students in practical training exercises, "Island Guardians" aims to address vulnerabilities exposed by the 2018 earthquake. Training modules will cover essential skills such as early warning systems, evacuation procedures, first aid, and psychological support, empowering students as proactive agents of safety and resilience in their schools and communities.*

*Emphasizing sustainability and scalability, the initiative will continuously evaluate and improve training programs to adapt to evolving disaster risks. "**Island Guardians**" seeks to serve as a replicable model globally, promoting collaboration and knowledge sharing to enhance disaster resilience in vulnerable regions. In conclusion, "Island Guardians" presents an innovative approach to disaster preparedness and community resilience in Lombok, Indonesia. By integrating education, community engagement, and strategic partnerships, the initiative equips communities to better withstand and recover from natural disasters, empowering youth as leaders in proactive disaster management.*

***Keywords:*** *Lombok earthquake, disaster preparedness, community resilience, youth empowerment, collaborative initiatives, sustainable practices.*

# The Team:

## Sakura Matsumoto

She is passionate about economic security with Japan's unique characteristics. She began to think about social resilience through her experience with the 2011 Great East Japan Earthquake and her career in the government. She has worked for the Ministry of Economy, Trade and Industry, Japan, for over 8 years. She holds a bachelor's degree in law from Keio University, and recently she has been studying at the Lee Kuan Yew School of Public Policy(LKYSPP), National University of Singapore.

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A master's candidate of Master in Public Policy (MPP) programme at Lee Kuan Yew School of Public Policy (LKYSPP), National University of Singapore. She majored in biology as an undergraduate and has a master's degree in science. She has worked on occupational health and safety for five years at the Ministry of Health, Labour and Welfare, Japan. She is interested in social policy and the labor market.

## Um Serey Vothny

is a senior-year Masters of International Affairs (MIA) student at Lee Kuan Yew School of Public Policy (LKYSPP), National University of Singapore. She holds a bachelor's degree in Global Affairs and another in Education. Prior to graduate school, she worked at the Ministry of Foreign Affairs and International Cooperation of the Kingdom of Cambodia for three years. Her fields of interest are international security and climate change.

## Lutfiya AL Qarani

is a Master's candidate in the Public Policy (MPP) program at the Lee Kuan Yew School of Public Policy, National University of Singapore, for the academic years 2022/2024. She is also a graduate of the Master's in Public Administration (MPA) program at Tsinghua University, completed in 2022/2023. Lutfiya has worked in the government sector for about six years in West Nusa Tenggara. During the first two years of her tenure, she focused on the response to the Lombok earthquake in 2018 and the rehabilitation of habitable housing. In addition to her government role, Lutfiya has been actively involved in social activities related to community development and education, contributing to the economic development of Eastern Indonesia. She firmly believes in leading a balanced life by actively contributing to the local community, which is essential for the future advancement of society.

***(Notes: Count words for introduction team (361 words))***

# Index:

# 1. Introduction

The era of globalization has brought about significant changes in technology, digitalization, and ease of access. However, it has also had an impact on the environment. Indonesia, an archipelagic country located on the Pacific Ring of Fire, is one of the most vulnerable nations to various natural disasters such as earthquakes, volcanic eruptions, tsunamis, and floods. One region frequently affected by disasters is Lombok Island in West Nusa Tenggara Province. In 2018, a series of major earthquakes struck Lombok, causing significant damage to homes and leaving many residents without shelter. This has resulted in economic instability and disrupted the community's way of life.

The 2018 Lombok earthquakes had a profound impact, with thousands of aftershocks following the initial quakes. The aftermath presented considerable challenges, further complicated by the COVID-19 pandemic, which made it difficult to stabilize the community and economy. In this context, the role of youth becomes crucial in enhancing disaster preparedness and response. Innovation is key, and youth are at the forefront of driving change, particularly in disaster education and preparedness. Besides educating the community, the development of technology, information systems, and active participation in disaster management activities are essential.

We believe that the spirit of youth can significantly contribute to the progress of a nation. We aim to analyze the issues faced by the government in managing the Lombok earthquakes, drawing inspiration from Japan, a country renowned for its advancements and innovations in disaster management. We have developed an innovative platform called **“Island Guardians”** which aims to create a significant impact by connecting various stakeholders in Indonesia and collaborating with Japanese authorities to improve disaster management in Lombok. This initiative involves leveraging students in Lombok through pilot schools, aiming to foster active disaster preparedness education. Our project consists of three primary phases: ***(1) Structural reinforcement of school facilities, (2) Evacuation drills for residents at schools, and (3) Raising awareness of evacuation procedures in the event of natural disasters.***

We recognize that the West Nusa Tenggara government cannot tackle this challenge alone and that substantial collaboration, driven by youth innovation, is essential. **"Island Guardians"** represents a fresh idea that we believe can bring about substantial changes in Indonesia’s eastern regions if implemented successfully. We will detail the practical application of this project through real-life examples and insights from the West Nusa Tenggara government’s efforts. This approach will help us ensure that our project can be effectively implemented in the future by the youth.

# 2. Current Problem in Lombok

## 2-1. Impact of Earthquake in 2018

The earthquake in Lombok certainly had significant impacts across various aspects, with social impacts being foremost. According to the National Disaster Management Agency (BNPB, 2018), more than 560 people died and thousands were injured. Many lost family members, homes, and suffered significant psychological trauma. This also led to displacement, with people living in limited tents provided by BNPB, national and international NGOs, and donors involved in post-earthquake evacuation efforts in Lombok. After decades since the early 1990s, Lombok experienced a devastating earthquake in 2018. The impacts felt by the community were multifaceted, including:

**a) Economic Impact**

The 2018 Lombok earthquake caused significant economic losses. According to the World Bank (2018), the total economic losses amounted to around USD 500 million. Infrastructure damage, including houses, schools, and healthcare facilities, added burdens to the population. The tourism sector, where Lombok is a popular destination for both domestic and international tourists, was particularly affected. This resulted in a sharp decline in tourist numbers after the earthquake, leading many hotels and restaurants to lose income and even temporarily close. The government and various stakeholders cooperated to mitigate these economic impacts.

**b) Infrastructure Impact**

Infrastructure damage was one of the most visible impacts of the 2018 Lombok earthquake. BNPB (2018) reported that more than 70,000 houses were severely damaged, with thousands more suffering moderate to light damage. Public facilities such as schools, hospitals, and places of worship also experienced severe damage. According to the Ministry of Public Works and Housing (2019), rebuilding the damaged infrastructure requires years and substantial funding. Reconstruction and rehabilitation programs conducted by the government and NGOs were crucial in restoring conditions on Lombok Island.

### c) Environmental Impact

The Lombok earthquake also had significant environmental impacts. Reports from the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA, 2018) indicated landslides in mountainous areas, resulting in damage to forests and local ecosystems. This environmental damage disrupted the ecological balance and worsened living conditions for communities reliant on natural resources for their livelihoods. Environmental recovery became integral to reconstruction efforts to ensure the sustainability of natural resources on Lombok Island.

The Indonesian government, along with various non-governmental organizations, implemented emergency aid programs immediately after the Lombok earthquake to provide basic necessities to refugees. International assistance from various countries and organizations, including the United Nations Development Programme (UNDP), supported infrastructure reconstruction projects. UNICEF (2018) provided psychosocial assistance to children and families affected by the disaster to help them cope with post-disaster trauma.

From the 2018 Lombok earthquake, valuable lessons were learned about the importance of disaster preparedness and rapid response. The social, economic, and environmental impacts necessitated collaborative efforts for recovery. By learning from this event, it is hoped that Indonesia can strengthen disaster mitigation systems and enhance community resilience to earthquakes in the future. Initiatives like **"Island Guardians"** are crucial to ensuring significant and tangible impacts are felt directly within communities.

### d) Education Impact

The 2018 Lombok earthquake profoundly impacted education, exacerbating vulnerabilities in infrastructure and disrupting learning for thousands of students. Across Lombok Island, numerous schools suffered extensive damage, leaving many children without classrooms (BNPB, 2018). Immediate measures were taken to set up temporary learning spaces in safer areas and provide essential materials, spearheaded by organizations like UNICEF and local NGOs, ensuring educational continuity amid challenges.

Beyond physical damage, the earthquake caused profound psychological trauma among students and educators. Psychological support and trauma counseling became integral to school activities, led by organizations like UNICEF, aimed at restoring emotional stability amidst chaos. Recovery efforts involved extensive reconstruction supported by the Indonesian government, international agencies, and NGOs. These initiatives not only repaired infrastructure but also aimed to enhance resilience against future disasters, emphasizing disaster preparedness integration into education. In conclusion, the Lombok earthquake underscored vulnerabilities in educational infrastructure and highlighted the critical importance of resilience and preparedness in safeguarding education during natural disasters. Collaborative efforts among government

agencies, international organizations, and local communities were crucial in mitigating the impact on students' education and laying the foundation for a more resilient educational system in Lombok.

## 2-2. Interview with the local government in Lombok

Natural disasters in Indonesia have occurred frequently, such as the earthquake in Lombok, as we have explained. On August 5, 2018, an earthquake with a magnitude of over 6.2 on the Richter scale struck Lombok. The earthquake occurred approximately 19 km northwest of North Lombok with a depth of about 15 km below sea level. The epicenter of the earthquake was on land, near the north coast of Lombok. This earthquake was part of a series of tremors affecting the region, including previous ones in July 2018. These earthquakes caused severe damage to infrastructure, residences, and public facilities, and deeply traumatized the local population.
The West Nusa Tenggara provincial government, under Governor Zulkieflimansyah's leadership, responded promptly and effectively to the Lombok earthquake. Emergency response and recovery efforts were swiftly implemented to mitigate the impact of the disaster. We attempted to contact stakeholders in the West Nusa Tenggara Province, particularly the Natural Disaster Department, and plan to revisit these discussions at a later time.

**The government's response included:**

**a) Emergency response, evacuation, and social assistance:**

Immediate emergency measures were taken to rescue victims and reduce further impact. Evacuations were conducted to move injured or threatened residents to safer locations. Temporary shelters were set up to provide protection and initial assistance, including the evacuation of tourists from Gili Trawangan island. The NTB government collaborated with humanitarian agencies and volunteers to provide food, clean water, and other supplies to earthquake victims. This effort also involved distributing necessary medicines and medical equipment to treat the injured, coordinated by several departments.

**b) Infrastructure recovery:**

After the emergency response phase, efforts focused on repairing roads, bridges, and other public facilities damaged by the earthquake. This was crucial to restore accessibility and facilitate economic and social activities in the affected areas. Collaboration with the national government was essential in this infrastructure recovery effort. Overcoming these challenges required genuine cooperation across various aspects of local government systems.

**c) Prevention and mitigation measures for the future:**

Earthquakes can leave deep psychological impacts, especially on children and families who lost loved ones or experienced trauma during the disaster. The NTB government provided counseling services and psychosocial support to help victims overcome trauma and restore

their mental health. As part of long-term response, NTB also emphasized prevention and mitigation measures to reduce future disaster impacts. This included enhancing disaster management capacity, safer spatial planning, and educating the public on safe behaviors during earthquakes.

Despite substantial efforts to respond to and recover from the 2018 Lombok earthquake, the NTB government faced challenges and criticism. Key challenges included limited resources and capacity at the local government level to handle such large-scale natural disasters like major earthquakes. Therefore, initiatives such as "Island Guardians" are expected to significantly impact the region's progress, particularly in post-earthquake recovery efforts in Lombok.

The NTB government's response to the 2018 Lombok earthquake reflects their commitment to protecting and supporting disaster-affected communities. Despite facing various challenges, these efforts underscore the importance of cooperation between government, communities, and other stakeholders in addressing serious natural disasters. The 2018 Lombok earthquake not only tested the physical resilience of the region but also the resilience, solidarity, and unity in facing unexpected challenges like natural disasters.

Innovations and new ideas from young people are needed to assist local governments in addressing these issues, particularly earthquakes, thereby significantly impacting the renewal of government commitments driven by the creative and impactful ideas of the younger generation. We plan to hold further discussions to explore the possibility of pilot projects in these locations, particularly in Lombok and selected schools that we believe are in great need of implementing our ideas.

# 3. Analysis

### 3-1. Literature review of local communities and culture in Indonesia

As we mentioned earlier, Indonesia is prone to natural disasters and exposed to a higher risk of climate change impacts. In this section, we will investigate how Indonesian local communities and culture affect disaster management to think of feasible plans for disaster risk reduction.

Previous studies revealed several cultural features affecting disaster response, management, and recovery.

#### 1. *Gotong royong*- a concept of mutual assistance

*Gotong royong* is an Indonesian traditional concept of mutual assistance. This concept enables the local community members to cooperate during a disaster. For example, during floods, people helped their neighbors particularly vulnerable households such as the elderly, without adults, or women headed. (Surtiari et al., 2017) It also enables children to contribute to their local community as its members. (Taylor & Peace, 2015)

#### 2. Diversity in ethnicity

Indonesia has over two hundred ethnicities and there are cultural differences between them. (Taylor & Peace, 2015) Even among people living in the same district and suffering from the same disaster, differences in ethnicity can affect their response to the disaster and adaptation to future risks. (Surtiari et al., 2017)

### 3. Special role of local community leaders

In Indonesia, there are local informal leaders or religious leaders in local communities. During natural disasters, they play a significant role in arranging relief distribution to community members. Their effort in distribution can lead to a broader range of distribution of basic goods or aids from external organizations. (Surtiari et al., 2017) These leaders also play the role of the community's gatekeepers. Thus, to implement external aids or programs effectively during a disaster, approaching them is important. (Rahiem et al., 2017) Moreover, community leaders can influence young generations in the community. Research on children of nine to thirteen years of age revealed that they "knew, trusted, and respected" their community leaders. (Taylor & Peace, 2015)

### 4. Religious perspective especially in Islam

Religion is one of the key factors in describing the Indonesian community and culture. A belief in one supreme being is one of the five principles of Pancasila, the Indonesian state ideology. Among major religions which are officially recognized by the state of Indonesia, Islam is the most dominant one. (Morfit, 1981) Thus, the perception of natural disasters by Muslims has been studied extensively. Previous studies revealed that some people regard natural disasters as "God's will" or reminders from God from a religious perspective. They have a positive view of the situation after the disaster because they believe that there will be ease after hardship. Also, they think that the victims of disasters die by their fate, and they will be rewarded with heaven. Researchers associated these beliefs with healing from the traumatic event and having a positive outlook in the future, but some of them point out that these beliefs can lead to adaptation to natural disasters only based on previous experiences. (Rahiem et al., 2017; Surtiari et al., 2017)
Moreover, researchers found that religious routines such as praying can help people to get a peaceful mind.(Rahiem et al., 2017) Such behavior also helps children recover from disaster psychologically.(Taylor & Peace, 2015)
In the implementation of policies or programs on disaster management in Indonesia, we should consider the unique features of Indonesian local communities described above.

## 3-2. Literature review of the policy-making process in Lombok

### 1. Brief overview of Disaster Risk Reduction (DRR) policies in Indonesia

As a remarkable event in Indonesian DRR policies, the Disaster Management Law (i.e. Law 24/2007) was established in 2007.(Mardiah et al., 2017) This establishment was in line with the "Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters" by the United Nations Office for Disaster Risk Reduction. (Mardiah et al., 2017; United Nations Office for Disaster Risk Reduction, 2007) The law aimed at the legal-based DRR and coordination of stakeholders. Consequently, the National Disaster Management Agency (BNPB)and the Local Disaster Management Agencies (BPBD) were established in 2008 as institutions for DRR at national and local levels respectively. The establishment of these institutions was meaningful because the institutions on DRR issues in Indonesia before that were rather temporal ones. (Mardiah et al., 2017) Since then, BNPB has been a key stakeholder in the implementation of DRR policies at the national level. At the local level, BPBDs and the Local Development Planning Agencies (BAPPEDAs) are important institutional actors. The non-governmental actors (i.e. academia and NGOs) also play a crucial role in implementing policies in local communities. (Mardiah et al., 2017)
However, Mardiah et al. pointed out there were some problems in this framework. The Disaster Management Law does not oblige local governments to allocate a budget for DRR, which leads

to the lack of a budget for DRR at the local level. Moreover, in 2012, only 15 % of BPBDs at the district/city level made a Disaster Management Plan despite 90% of districts/cities establishing their BPBDs.(Mardiah et al., 2017)

**2. Policymaking in Lombok**

The national government of Indonesia started to give local governments more autonomy in policymaking (including disaster management) by passing decentralization-related laws in 1999 (Mardiah et al., 2017; Usui & Sugiyanto, 2004). The Central Lombok district in the West Nusa Tenggara province was also subjected to a decentralization programme. The study on the first three years of decentralization in this region argued that policymaking process in Central Lombok comprised top-down and bottom-up approaches. The top-down approach included making local planning documents in line with central government's planning documents with national priorities. The bottom-up approach included consultation meeting with local people in several levels: sub-village level (Musbangdus), village level (Musbangdes), sub-district level (UDKP), local government level (Rakorbang Kabupaten), provincial level (Rakorbang Propinsi), and national level (Rakorbangnas). The authors argued that the balanced combination of top-down and bottom-up was desirable. However, they pointed out that in reality, top-down approach dominated, and local people were left behind from decision making. (Usui & Sugiyanto, 2004)
The decentralization flow also came to school management. In 2000, the idea of school based management (SBM) started to be promoted toward school autonomy as a part of plans to improve education in Indonesia. In 2002, the Ministry of National Education issued a decree which legalized SBM. SBM policies included bringing various stakeholders such as principals, parents and community members as well as teachers and students together in the School Committee (SC). However, according to the study on SBM in the municipality of Mataram, Lombok in 2004, the manner of school management was mostly centralized and bureaucratic same as before the introduction of SBM, due to a lack of clarity in policies.(Sumintono, 2006)
More recently, the decentralization of policymaking is proceeding in disaster management area too. The Law Number 23 of 2014 on Regional Governance and Government Regulation Number 2 of 2018 concerning Minimum Service Standards assigned responsibility for disaster management to local governments. Whether this decentralization working well or not depends on the capacity and responsibility of the local governments, through the involvement of local communities. Considering that the financing for the recovery from the earthquake disaster in Lombok July-August 2018 highly depended on the budget of national government, there is still work to be done to achieve autonomy in disaster management. (Hadi, 2019)

**3-3. DRR education in Youth - Comparative analysis with an example of Japan**

Because our project targets youth in Lombok, here we focus on schools and education in disaster management. Sendai Framework for Disaster Risk Reduction 2015-2030 by UNDRR is including reducing disaster damage and developing resilience of educational facilities and promoting the incorporation of disaster risk knowledge in formal and non-formal education as a goal or priority. (United Nations Office for Disaster Risk Reduction, 2015) We firstly overview the situation of the disaster risk reduction education in Indonesia and secondly compare it to that in Japan, another disaster-prone country.

**1. DRR education in Indonesia**

The government of Indonesia is eager to integrate DRR into education. Law 24/2007 regards disaster education as the right of the people. (Bisri & Sakurai, 2017) The government of

Indonesia started a pilot project of disaster-safe schools (or Sekolah/Madrasah Aman Bencana in Bahasa) in 2009, which more than 25,000 schools implemented in 2013. DRR was incorporated in the national curriculum for primary to secondary schools in 2009. BNPB published guidelines on safe schools in 2012. (Amri et al., 2017)

The DRR education in Indonesia implemented in each school has variety. For example, it includes disaster-related poetry reading, tsunami video screening, making evacuation map, evacuation drills, classes using mock-ups and models of earthquakes and volcanoes, and participation in disaster-related events.(Bisri & Sakurai, 2017)

However, researchers pointed out several problems in the implementation of DRR education.

Far from nationwide implementation- 75% of schools in Indonesia are in disaster-prone areas. (Bisri & Sakurai, 2017) However, due to a lack of compulsory regulation, only 4 % of all kinds of schools adopt DRR education. (Amri et al., 2022) Moreover, the majority of school personnel are not aware of DRR education policies despite a variety of policies made by the central government.(Amri et al., 2017)

Lack of sustainability in programme- DRR education programmes in Indonesia are often supported by government agencies and/or NGOs. However, due to their limited budget, DRR education events tend to result in one-time event, including training and emergency drills. (Amri et al., 2017) Lack of continuous fiscal support for DRR education from local governments makes things harder.(Amri et al., 2022; Bisri & Sakurai, 2017)

## 2. DRR education in Japan

Like Indonesia, Japan is also prone to natural disasters caused by typhoons, torrential rains, heavy snowfalls, floods, landslides, earthquakes, tsunamis, and volcanic eruptions due to its location, topography, geology, weather, and other natural conditions. (Cabinet Office, 2006)

Considering this background, the government of Japan has been promoting DRR education and school security. As mandate policies, Fire Service Act (Act No. 186 of 1948) mandates schools prepare a fire defense plan and conduct drills. School Health and Safety Act (Act No. 56 of 1958) mandates schools prepare school safety plans and procedures for dealing with hazards. Also, DRR education implementation is included in the curriculum guidelines for kindergarten, elementary school, junior high school, high school, and special needs schools. (Ministry of Education, n.d.) As a result, 99.7 % of schools in Japan provided some form of DRR education. (Ministry of Education, 2021) The government is incorporating DRR education into university programs that train teachers, as well as providing training to in-service teachers.(Ministry of Education, 2020)

Also, the 1995 great Hanshin-Awaji earthquake, became a turning point in Japanese policies toward disaster-resilient school facilities. After the earthquake, the Ministry of Education started to promote earthquake resistance of school facilities and accelerated this policy after Great East Japan earthquake in 2011. This project was fiscally supported by national subsidies to local governments. (Sakurai & Sato, 2016)

On the other hand, there are differences in school safety efforts among regions, schools, and teachers, as well as a lack of continuity.(Ministry of Education, 2021)

## 3. Comparison between Indonesia and Japan

Analysis of policies in both countries shows that DRR education is more prevalent in schools in Japan than in Indonesia. The reasons for this are probably the inclusion of mandatory regulations such as evacuation drills and simply the longer time that DRR education has been promoted. In addition, the provision of budgets for school facilities and training for teachers may have contributed to the high implementation rate. However, with regard to efforts beyond the mandate, problems such as differences among regions and low sustainability have been pointed out in Japan too.

# 4. The Project

### 4-1. Description of the project

Considering the social characteristics of Lombok and the differences between Indonesia and Japan in disaster management, especially in education, described in the previous chapter, we examined a project to address the vulnerability of the educational environment in Lombok during natural disasters.

The project is mainly divided into three parts.

1. Structural reinforcement of school facilities
2. Evacuation drills for residents at school
3. Raising the awareness of evacuation in the event of natural disasters

**1. Structural reinforcement of school facilities**

- Strengthening the restrictions of school buildings to secure the place where people can evacuate.
- If necessary, rebuilding/strengthening the school facilities:
  This step not only focuses on making schools safer but also aims to create a standardized, scientifically informed framework for resilient educational infrastructure in Lombok's disaster-prone environment.
- The following procedures can be taken to achieve the school's resilience:
  - The municipal government along with the central government should seek help from foreign specialized agencies such as the Japan Meteorological Agency, and the Fire and Disaster Management Agency for knowledge and technology exchange.
  - Establish uniform building codes and construction standards specifically tailored for school buildings in Lombok's unique geological context, such as incorporating tsunami-resistant design features (elevated structures, breakaway walls on lower floors, and strategic orientation of buildings relative to the coastline).
  - Conduct comprehensive risk assessments for each school site, considering local seismic activity patterns and potential tsunami inundation zones.
  - Integrate modern technologies like base isolation systems and dampers to absorb and dissipate seismic energy during earthquakes.

- Ensure regular structural inspections and maintenance protocols to maintain the long-term resilience of school buildings (can seek help from expert countries like Japan's NGO or government)
- Develop and implement evacuation infrastructure within school designs, including accessible routes, safe assembly points, and vertical evacuation structures where necessary.

**2. Evacuation drills for residents at school**

Comprehensive evacuation drills for residents are important to ensure that large numbers of residents are systematically evacuated from places of safety, especially in the case of a tsunami that can engulf many lives in a short period of time. From the government's perspective, if residents stay in specific places in the event of natural disasters not in each residence, it is easier and more effective to assess the situation of residents, including their health, and deliver the necessities like food and medicines to residents. Also, from the resident's perspective, it will be easier for them to receive the aforementioned public services than if they stay in their own homes, and they will also be able to cooperate with others who have also evacuated to the place to gain physical and psychological stability.

As discussed in the previous chapter, we propose the following evacuation drills, referring to the example in Japan.

- We chose public schools as evacuation sites in terms of strengthening the disaster prevention functions of educational facilities.
- During evacuation drills, residents move to pre-assigned public schools (usually the closest school to their residence) after personal and their families' safety are ensured. Public school students should keep themselves safe on site and move to the school grounds or other pre-assigned large-spaced areas.
- **The teachers at the school and local government officials** will be responsible for the function of checking the safety of the school facilities and providing instructions to those who have evacuated to the school. Municipal officials will serve as liaisons with **industry, foreign countries, and NGOs** to promote cooperation among municipalities and with other organizations.
- Municipalities that receive information from personnel at the school are required to cooperate with the police, health centers, and the industrial side to provide appropriate assistance to the affected people (energy, food, health functions, etc.)

**3. Raising the awareness of evacuation in the event of natural disaster**

The local/municipal government will promote awareness of disaster preparedness through mobile alerts (SNS), social media campaigns, and community events, emphasizing evacuation drills and raising awareness among residents about the importance of planning for future natural disasters.

- **For mobile outreach:**
  - Develop an SMS-based alert system for those without smartphones
  - Create a mobile app with evacuation routes, tips, and real-time updates
- **For social media:**
  - Create dedicated accounts on popular platforms like Facebook, Instagram, and Twitter

- Use local hashtags
- Share infographics, short videos, and eye-catching visuals about evacuation procedures

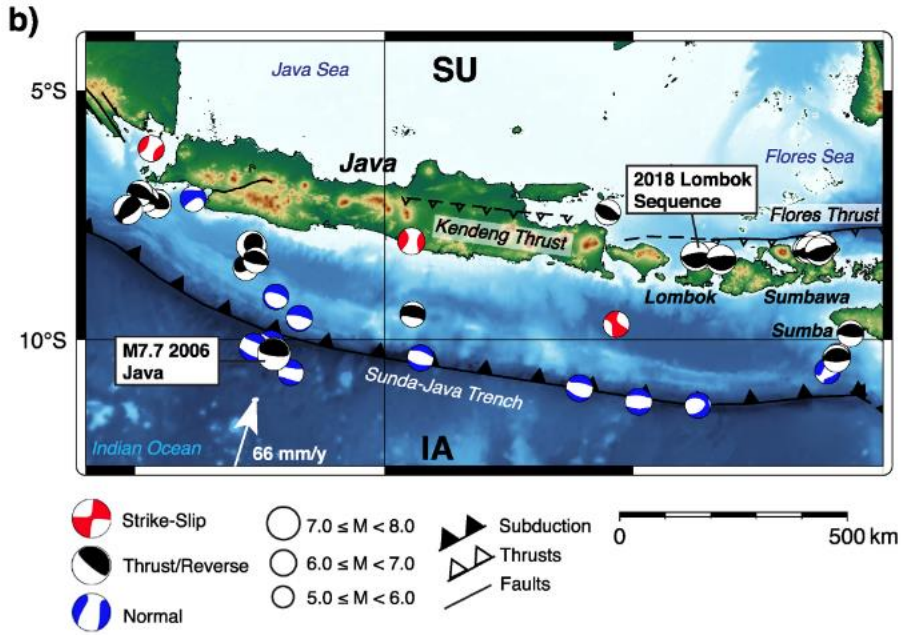
- **For community gatherings:**
  - Work with the leaders of villages to organize town hall meetings in different villages and neighborhoods
  - Partner with local religious institutions to spread information after prayers or services
  - Set up information booths at popular community events or markets

### 4-2. Targeted area (areas, population, etc.)

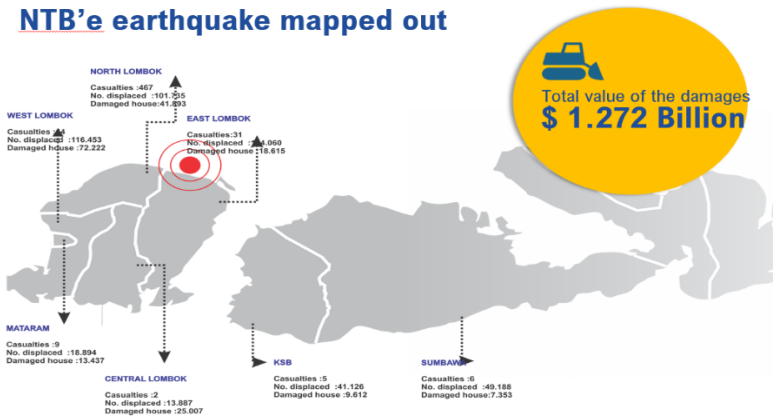
When choosing specific schools for the pilot project, we took the following points into account.

#### 1) Geography and characteristics

Considering the place where the two massive earthquakes hit Lombok in 2018 and thrust faulting, North Lombok was considered a potential location to implement the pilot program. In addition, Mataram City, Lombok's largest city, was also selected as a potential site for the pilot program, given its population density and accessibility to government institutions.




**(Sean J. Hutchings, Walter D. Mooney, 2021)**




**(The Province of West Nusa Tenggara, 2022)**

### 2) Acceptance of various religions

As mentioned earlier, since Lombok is home to people of many different religions, acceptance of the various religions is essential for the smooth implementation of this project involving many residents. Therefore, we pick public schools with no restrictions on specific religions.

Considering the above points, we have selected the following three junior high and senior high schools in Lombok. The pilot project will be implemented in cooperation with the residents of the communities where these schools are located.

| | |
|---|---|
| SENIOR HIGH SCHOOL 1 GANGGA | North Lombok |
| SENIOR HIGH SCHOOL 1 SEKOTONG | North Lombok |
| State Junior High School 2 | Mataram City |

## 4-3. Stakeholders

There are many possible stakeholders in developing this project in Lombok.

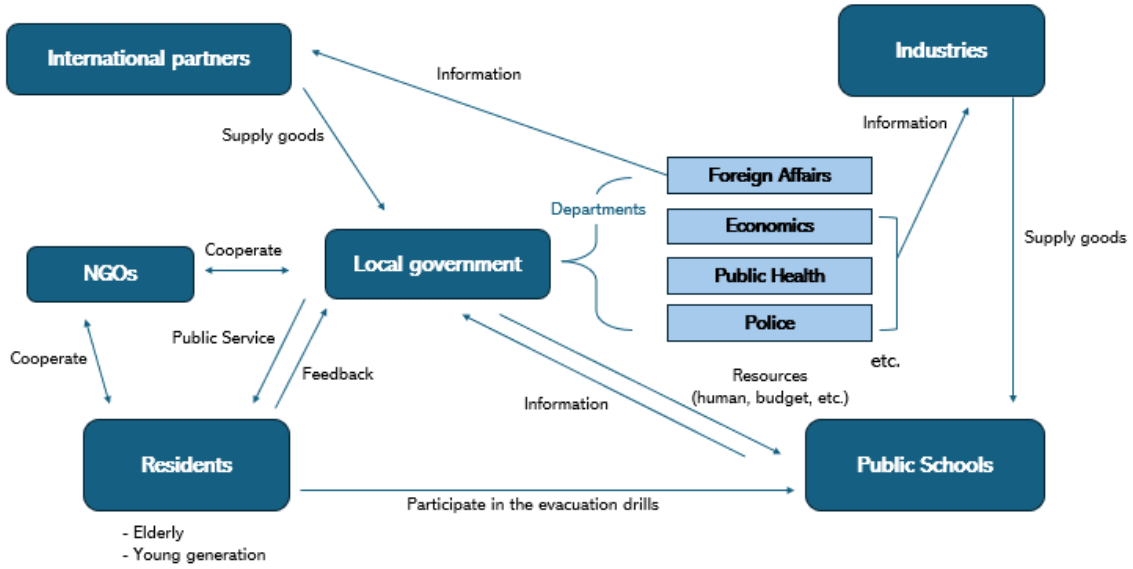
As the following chart describes, the main stakeholders here are 1) Local government, 2) Residents, 3) Public Schools, 4) Local industries, 5) International partners including foreign governments and private companies, and 6) Local NGOs.

In terms of organizing residential information and developing systems throughout the area, the responsibility of the local government is important. They will share the affected area's situation to coordinate to receive the necessary support from many stakeholders including industries and international partners. Therefore, local government departments are expected to coordinate with their respective departments in charge of their respective areas of responsibility, such as foreign affairs and public health.

In addition to the role of local governments, cooperation among residents across generations is also essential. To secure the educational environment and the lives of residents as much as possible, even the elderly, who are usually far away from the educational environment, need to understand the situation and their feelings and cooperate across generations.

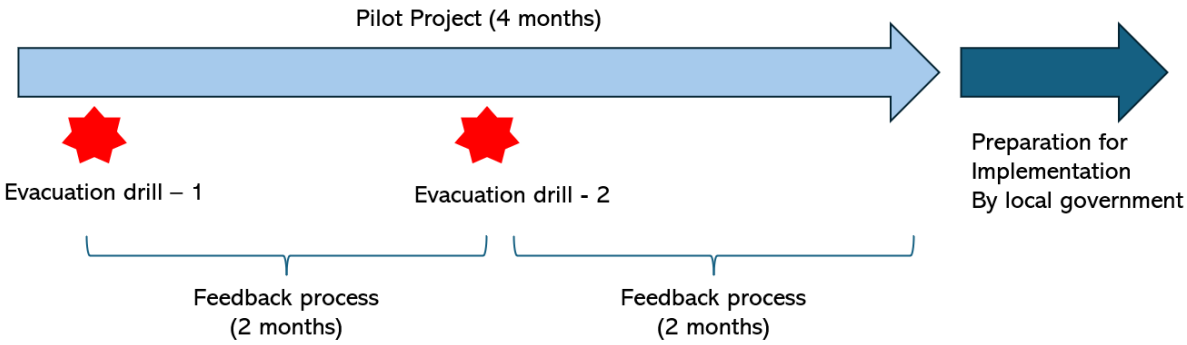
Finally, the role of NGOs and NPOs is necessary for the success of this project. As aforementioned since there are many stakeholders, organizations that can facilitate coordination are needed. For

example, an organization specializing in international cooperation could serve as a coordinator between foreign companies and local companies. In addition, since local government resources are limited, an organization that can provide training to teachers in designated public schools is also essential. For example, an organization specializing in human resource development might be able to provide training for teachers prior to evacuation drills.




### 4-4. Schedules

The project is scheduled in three parts: 1) pilot project (four months), 2) review periods (two months each), and 3) implementation.




During the four months of the pilot project, the evacuation drills will be held every two months, and between the drills, the participants will feedback and comments to the local governments. The pilot projects require the participation of pre-designated residents who are leaders of the communities and younger generations with children under the age of 20. In addition to verifying the effectiveness of evacuation drills and reporting back to the municipality, these participants play an important role in spreading the word about the drills to residents. Hence, we chose that community leaders should be responsible for attending the drills of the pilot project based on the importance of the traditional roles of community leaders in Indonesia, as we mentioned before.

After four months of the pilot project, the local government is required to consider ways to realize the actual project, including budgetary issues. In particular, since structural reinforcement of school buildings is expected to require a huge budget, the local government should not only request a budget

from the provincial government but also cooperate with NGOs to secure sufficient funds and human resources to make this project a reality.

After this meticulous planning process, the actual project will be implemented. Thus, the actual project may not necessarily be implemented immediately after the pilot project. In-depth planning includes coordination with other countries, NGOs, and industry. We hope that these projects will be implemented not only in the three pilot areas but also in other areas of Lombok.

### 4-5. Implementation

At the implementation stage, the following tasks need to be implemented. These should be improved based on the feedback from the residents and discussion among the local government.

1) Evacuation drills for residents at school
    - Every three months, the evacuation drills need to be implemented
    - During an evacuation drill, all residents must evacuate to a pre-designated public school, except in cases of emergency, such as health or family problems.
2) Structural reinforcement of school facilities
    - Conduct regular structural inspections and make repairs to school buildings if necessary
    - Maintain and upgrade the database of school facilities' resilience
3) Raising the awareness of evacuation in the event of natural disasters
    - Continue efforts to disseminate and instill disaster preparedness as described above to residents while updating methods

### 4-6. Cooperation with other countries

Cooperating with a country like Japan, which has extensive experience in disaster preparedness, could significantly enhance Lombok's evacuation training program. The program in Lombok could seek assistance from the Japanese government through collation in the following fields:

- Knowledge Exchange:
    - ➢ Organize workshops with Japanese disaster management experts & Invite Japanese trainers to conduct specialized courses for local disaster management teams
    - ➢ Arrange study visits for Lombok officials to observe Japan's disaster preparedness systems
    - ➢ Implement best practices from Japan's community-based disaster management programs
- Technical Assistance:
    - ➢ Seek Japanese expertise in developing early warning systems
    - ➢ Collaborate on creating hazard maps and risk assessments for Lombok
    - ➢ Gain insights into Japan's building codes for earthquake and tsunami-resistant structures
- Technology Transfer:
    - ➢ Adopt and adapt Japanese technologies for earthquake and tsunami detection

- Explore the use of Japan's disaster information communication systems

- Joint Research:
  - Conduct collaborative studies on disaster risks specific to Lombok
  - Develop localized solutions based on Japanese research methodologies
- Education Initiatives:
  - Incorporate elements of Japan's disaster education curriculum into Lombok's schools
  - Develop exchange programs for students and educators focused on disaster preparedness
- Funding and Resources:
  - Seek support from the Japan International Cooperation Agency (JICA) for program implementation
  - Explore public-private partnerships with Japanese companies specializing in disaster-resistant infrastructure

### 4-7. Evaluation of the project (SWOT Analysis)

| **Strengths** | **Weakness** |
|---|---|
| - Multi-channel approach, reaching diverse demographics<br>- Utilization of both modern (social media) and traditional (community gatherings) methods<br>- Use of visual aids (infographics, murals) to overcome language barriers & create better retention<br>- Integration with existing community structures (public schools) | - Potential high cost for comprehensive implementation<br>- Reliance on technology for some aspects (may exclude less tech-savvy populations)<br>- Need for a consistent, long-term effort to maintain awareness |
| **Opportunities** | **Threats** |
| - Increased community resilience and preparedness for natural disasters<br>- Potential to become a model program for other disaster-prone regions<br>- Development of stronger community bonds across generations through shared preparedness activities<br>- Possible attraction of international funding or support for disaster preparedness<br>- Creation of jobs or volunteer roles in disaster management and community education | - Natural disaster occurring before full program implementation<br>- Cultural or religious beliefs that may conflict with scientific preparedness measures<br>- Political changes affecting program support or funding<br>- Complacency or fatigue if no major disasters occur for an extended period --> creating a demotivating phase of program's participation. |

### 4-8. Limitation

- **Necessity of enactment of Law**

Developing comprehensive systems of evacuation drills and strengths of school buildings may require policies or laws that are not mentioned in this paper but that articulate rules and mandates. Enactment of legislation may take more time than anticipated because of the political process and public hearings required. Hence, in this case, we have to carefully look at the political movement like the timings of elections and political stability. However, since no one knows when natural disasters will occur, immediate action is needed, and therefore, measures need to be taken before policies and laws are enacted.

- **Political and Bureaucratic Changes:**

Measures to prepare for future natural disasters must be maintained over the long term. When there are changes in political leadership and in bureaucracy, the continuity of the project could also change. Upcoming local government might have other priorities and new agendas.

- **Applicability to other regions and a wide range of disasters**

Although this paper focuses on two districts of Lombok Island, different factors are needed to consider if this system will be applied to other areas of Lombok or outside of Lombok Island. In other words, it is necessary to carefully assess the characteristics of the areas where this system is planned to be applied and tailor the plan to each area. For example, specific evacuation drills and advertising methods need to be devised, considering the religion and age distribution of the residents, the location of public schools, and other factors. Furthermore, since this paper mainly aims at dealing with the vulnerability in the event of earthquakes, it is necessary to consider in more depth what kind of evacuation drills are necessary in the event of natural disasters other than earthquakes, such as floods.

- **Financial Constraints:**

The implementation of cutting-edge Japanese technologies and systems in Lombok is expected to entail substantial investment, encompassing the purchase of equipment, training programs, and infrastructure development. Due to the anticipated financial constraints, securing sustainable funding for long-term projects could be an intricate process, involving meticulous planning and strategic financial management.

- **Technical Capacity:**

One of the potential challenges is the lack of technical expertise required to maintain and operate advanced systems. This could lead to issues with system performance and maintenance. Training local personnel to the necessary level may be time-consuming and expensive, potentially impacting project timelines and budget. Also, the availability of skilled technical personnel in the local area should also be thoroughly assessed to ensure there are suitable individuals to undergo training and assume operational responsibilities.

- **Infrastructure Limitations:**

Lombok's current infrastructure such as road and electricity may not be compatible with some of the advanced systems used in Japan. Upgrading the infrastructure to accommodate new technologies could be a significant undertaking.

# 5. Conclusion

In conclusion, the proposed disaster preparedness program for Lombok that aim to ensure an educational environment and provides an important opportunity to enhance the island's resilience to natural disasters, especially earthquakes, and tsunamis, by drawing parallels with Japan's proactive approach to disaster management. The initiative aims to create a comprehensive system that is culturally appropriate for Lombok, taking into account community characteristics such as religion, as well as utilizing Japan's wealth of experience and advanced technology.

The comprehensive approach, encompassing public awareness campaigns, technical upgrades, and community engagement, has the potential to dramatically improve Lombok's disaster response capabilities. By standardizing building practices, implementing early warning systems, and conducting regular evacuation drills, we can significantly reduce the potential loss of life and property in the event of a natural disaster.

While the project faces challenges, including financial constraints, technical capacity limitations, and potential cultural barriers, these obstacles are not insurmountable. With careful planning, adaptive implementation, and a commitment to long-term sustainability, we can address these issues effectively. The cooperation with Japan offers not just technical expertise, but also opens doors for cultural exchange, knowledge sharing, and the development of lasting partnerships. This collaboration could serve as a model for other disaster-prone regions, positioning Lombok as a leader in community-based disaster preparedness.

Ultimately, the success of this program will depend on the active participation of local communities, sustained governmental support, and effective integration of Japanese expertise with local knowledge and practices. By investing in this program, we are not just preparing for potential disasters, but also building a more resilient, informed, and united community in Lombok.

The path ahead may be challenging, but the potential benefits – in terms of lives saved, communities protected, and a more secure future for Lombok – make this project an essential and worthwhile endeavor. With commitment, collaboration, and continuous improvement, we can create a safer, more prepared Lombok for generations to come.

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