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Evaluation of Rescue Activities on Loss and Damage as Occurred due to the Recent Earthquake in Myanmar 2025

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Abstract

Earthquakes are among the most devastating natural disasters, often causing widespread destruction, loss of life, and long-term socio-economic impacts. This study focuses on analyzing the damage, emergency response, and health and safety measures associated with the 2025 Myanmar earthquake. A range of existing reports, scholarly articles, and official documents were reviewed, with particular emphasis on structural damage assessments, emergency rescue operations, and public health responses. The 2025 Myanmar earthquake, with a magnitude between 7.7–7.9, caused catastrophic damage, resulting in a significant loss of life and widespread destruction of numerous buildings, including homes, schools, religious sites, and historic landmarks. Key infrastructure, such as roads and bridges, was severely damaged, isolating affected areas and delaying rescue efforts. Despite facing significant logistical challenges and limited resources, local emergency responders and international aid teams conducted extensive rescue operations. Health services were overwhelmed as many hospitals collapsed or became unusable, forcing outdoor treatment. Emergency shelters were overcrowded, raising the risk of disease outbreaks. Further research can focus on long-term health effects, the state of shelter facilities, assistance provided to vulnerable populations, and the efficiency of aid distribution and infrastructure rehabilitation.

Keywords: *Myanmar Earthquake, Health & Safety, Rescue Management, Earthquake Damage, Safety Management*

1 Introduction

An earthquake is a natural disaster caused by the movement and interaction of Earth's tectonic plates, which are large pieces of lithosphere that constantly move. These movements create stress on rocks. It causes them to fracture and release stored energy in the form of seismic waves, resulting in shaking. Earthquakes are classified into types (Bilek & Lay, 2018) such as mainshock (the largest in a sequence), foreshocks (precede the mainshock), and aftershocks (follow the mainshock). Blind thrust earthquakes occur without visible surface signs, while megathrust earthquakes, found at convergent plate boundaries, are highly destructive and can trigger tsunamis. Countries most affected by earthquakes include Japan, Indonesia, Nepal, Turkey, Iran, Chile, Mexico, the Philippines, China, the United States, and Myanmar (Zhang et al., 2021; Li et al., 2021; Peduzzi, 2006). Japan is one of the countries where earthquakes often occur due to its position along active tectonic plate boundaries, and Japan has faced around 1,563 earthquakes. On 11 March 2011 (Smay, 2016), a 9.0 magnitude megathrust earthquake triggered a devastating tsunami in Japan's Tohoku region, causing over 18,500 deaths and massive destruction. The tsunami waves, over 40 meters high, heavily impacted prefectures like Iwate, Miyagi, and Fukushima. Indonesia and Mexico experienced the highest number of earthquakes globally. Between 2015 and 2025 (The Complete Indonesia Earthquake Report (Up-to-date 2025)., n.d.), Indonesia recorded 20,489 earthquakes, while Mexico experienced 17,540 events of magnitude 4.0 or greater within a 300 km radius. These figures underscore the intense seismic activity and earthquake risk faced by both countries. Myanmar experiences moderate to strong earthquakes quite frequently, with several conspicuous earthquakes occurring every few years. On average, earthquakes of magnitude 5.0 or higher happen approximately every 1 to 3 years, while smaller tremors are much more common. The country's location near active plate boundaries makes seismic activity a regular occurrence. In 2025, Myanmar faced its strongest and most frightening earthquake ever when, on March 28 at around 12:50 PM (Sun et al., 2025), a great earthquake shook Myanmar and Thailand, striking the Mandalay region; it was the most powerful earthquake Myanmar had faced since 1912 and the second deadliest disaster in its modern era, with a magnitude of 7.7 to 7.9 affecting Central Myanmar, Thailand, and Southwest China (Wang et al., 2025). The earthquake caused significant damage in both Myanmar and Thailand, resulting in many deaths and injuries, and heavily damaged buildings, shops, markets, mosques, temples, schools, roads, historical palaces, and other infrastructures. Essential supplies such as water, electricity,

and fuel were cut off, making rescue missions very difficult as rescue workers faced shortages of medicine and other necessities and had to dig through rubble with their bare hands to save people trapped underneath in Myanmar.
The primary objective of this research is to explore health and safety management, damage assessment, and rescue operations related to the Myanmar earthquake. The novelty of the study lies in gaining comprehensive insights into effective earthquake management strategies.

2 Methodology

2.1 Research Framework

The research framework for the 2025 Myanmar earthquake adopts a multidisciplinary structure, focusing on damage analysis, health and safety, rescue management, and existing reports and articles reviewing, as shown in Figure 1. It examines fatalities, infrastructure damage, emergency response, medical support, and resource allocation. Using reports and articles, the framework aims to enhance preparedness, effective response, and resilience in future disasters.

Figure 1: Research Framework for the Earthquake of Myanmar 2025

3 Thematic Findings and Discussion

3.1 Damages Analysis of Earthquake

3.1.2 Fatalities

After the shocking 7,7 magnitude earthquake in Myanmar, 5,352 people in Myanmar and 103 people in Thailand died, 11404 people got injured, and more than 100 people are missing (Hagan, 2025). Many people died after being buried under the rubble after the earthquake. The Sky Ville, a large condominium building that was located in Mandalay, collapsed during the earthquake. The Rescue worker found nine dead bodies under the rubble of that building. West Mye Mye Kyi pre-school is located in Mandalay Region. collapse during the earthquake. 12 children and a teacher died, and more were trapped in that school. The dead bodies of 12 children and a teacher have been found under the rubble. An unconfirmed report says that 50 children and 6 teachers were missing after the building collapsed. Rescue workers found many dead bodies under the rubble. “The smell of the dead bodies has overwhelmed the town,” Ko Zeyar (Regan et al., 2025). More than 100 people died during the earthquake disaster in the village area of Myanmar, and many people got trapped under the collapsed buildings in Mandalay. This earthquake caused a heavy loss of life in Thailand, where 103 people died and 42 were injured in Bangkok, the capital city. The number of missing people is 78. After this shocking earthquake, the Deputy Prime Minister of Thailand confirmed that around 50 people were missing after the collapse of a massive building that was under construction at the time. However, the earthquake was so terrible and large that it was very difficult for journalists to find out the exact death toll, as several people were still under the rubble and had died. The death toll reports for the Myanmar earthquake on different dates following the day of the earthquake are shown in Table 1.

Table 1: Death reports for five days after the earthquake in Myanmar (BBC, CNN, & The Star)

	29 March	30 March	31 March	1 April	2 April
BBC	144	1,700	2,056	2,700	2,900
CNN	-	1,600	-	2,700	2,700
The star	144	1700	2000	-	2,719

3.1.2 Residential Damage

A huge number of buildings collapsed during the earthquake in Myanmar, with around 50,000 buildings destroyed in central Myanmar, according to the Junta, of which 48,834 were residential (The Irrawaddy, 2025). The magnitude of the earthquake was so high that many buildings developed cracks, completely collapse, and the Chiang Mai condo, a luxury condominium complex, was closed due to the appearance of large cracks after the earthquake, as shown in Figure 2.

Figure 2: Chiang Mai Condo, A Luxury Condominium Complex, Closed Because of Cracks (Mail, 2025)

Many people had to live on the streets for a few days after the earthquake because of residences collapse, and almost the entire town lived and slept on the road, a platform, or a football field. A huge number of people lost their homes in Mandalay, where houses, schools, temples, mosques, and shops lie in ruin, said volunteer rescue worker Kyaw Min, who described it as a place of death, like the town was bombarded by a nuclear bomb (Regan et al., 2025). In Thailand, the earthquake caused significant damage to buildings in the capital, including a building under construction by a Chinese and Thai firm in Bangkok that collapsed within moments after the shocking earthquake. The building shook and fell to the ground, turning into rubble as people ran to safety, but workers inside were buried and trapped under the debris. Many workers are missing, and numerous people were injured. Swimming pool water overflowed from the tops of tall buildings during the earthquake. This earthquake caused significant damage to houses not only in Myanmar but also in Thailand's capital.

3.1.3 Roadway Destruction

This devastating earthquake damaged roads in Myanmar, with the Yangon–Nay Pyi Taw–Mandalay expressway being severely affected, leading to several disruptions and major traffic problems. The earthquake caused cracks and surface distortions, forcing highway buses to halt operations (Reuters), with significant damage reported at 283 points and tremors felt across 185 areas, creating widespread issues for traffic movement. Serious damage was also noted at the 358/2B milepost, which has been temporarily repaired to restore some level of control. Due to the extent of the damage, vehicle speed limits have been significantly reduced, resulting in much longer travel times than before (Myanmar News Agency, 2025). Road damage is shown in Figure 3.

Figure 3: Earthquake-Induced Roadway Damage in Myanmar (Burmese, 2025)

According to a toll employee of Myanmar that there is almost no traffic, private cars are rare, and some bridges, including the one over Swa Creek, have collapsed (Kaung & Kaung, 2025). Most of the vehicles are using the old highway due to damage at milepost 138, which has led to a noticeable decrease in traffic on the main road as vehicles continue diverting to the old route. According to the Myanmar Information Management Unit (MIMU) of the UN, this strong earthquake caused several bridges to collapse between Mileposts 93 and 134 on the new highway, while parts of the road sank by 5 to 10 inches, creating further challenges. Over 20 sections of the Yangon–Naypyitaw highway were damaged, stretching travel time to more than 11 hours instead of the usual 8, and even the old road has developed cracks, making travel to nearby towns difficult and unsafe.

3.2.4 Damage to Other Infrastructures

Many historical places also collapsed in this earthquake, including the Maha Muni Buddha Temple, one of the most beautiful and ancient temples in Mandalay, built in 1784 by King Bodawpaya, which was damaged during the quake. The royal place collapsed in Mandalay, as shown in Figure 4 (a), while the Ava Bridge fell into the river, shown in Figure 4 (b).

(a) (b)

Figure 4: Infrastructure Collapsed during the Myanmar Earthquake (Glen, 2025); (a) Formal Royal Place, (b) Ava Bridge

Several important buildings, such as the Ministry of Foreign Affairs, the Ministry of Labor, and the Ministry of Transport and Communication, were also damaged or collapsed. According to Wikipedia, over 9,600 religious buildings, including pagodas, monasteries, and mosques, were destroyed, and the Min Street Mosque is feared to have collapsed with over 100 people trapped inside. Additionally, some monastic schools and a nunnery in the city suffered damage, and a few military buildings collapsed, resulting in the deaths of more than 100 soldiers

3.2 Rescue Operations

National: local rescue workers in Myanmar have been actively involved in emergency response efforts after the 2025 earthquake. They were among the first on the scene, often working with limited tools and resources, especially in rural and severely damaged areas like Mandalay. Local volunteers, firefighters, medics, and even ordinary citizens helped dig through rubble, transport the injured, and distribute food and water. The local worker dug rubble with his bare hands to save people. They did not have many tools to use at that important time. Also, they create more temporary shelters for displaced families. The local rescue worker provided first aid. And they also helped international rescue workers. After the strong earthquake hit Myanmar in March 2025, five major organizations stepped in to help despite challenges caused by conflict. Project HOPE, Save the Children, IFRC, IRC, and Doctors Without Borders are providing medical care, clean water, food, and support for children and families. They are also helping to rebuild damaged schools and clinics, and are working hard to reach people in remote areas who need urgent help. Despite all this, some news said the Junta blocked aid and supplies. Many aid workers say that the junta is not allowing help to reach the worst-affected areas unless it's through their military system. Dr. Nang Win, a medical doctor working with aid groups, said: “People are dying not only from the earthquake, but because they can’t get help in time.” She is warning that more people may die unnecessarily if the government keeps blocking or delaying aid. She also said the health situation is critical, people are injured, hungry, sick, and scared, but aid is not reaching them fast enough.

International: Rescue operation began shortly after this scary, massive earthquake. The first rescue team, known as the Blue-Sky Rescue Team sent from China. There were 16 members in that team. On 29 March, China sent rescue support to Myanmar. It is a civil rescue team. It carried 5 vehicles of medical supplies. They supplied first aid kits, power and lights, equipment, and demolition tools. Blue Sky Rescue is China's largest non-governmental professional emergency rescue organization. Also, the Chinese government sent a rescue team with 82 members to carry out humanitarian relief operations (CGTN). Hong Kong also sent support and supplies for the rescue operation. They sent rescue personnel to assist the rescue workers in Myanmar. Russia sent two

aircraft of rescue personnel, 120 specialists, the K9 search team, anesthesiologists, and psychologists. India sent rescue personnel, medical teams, and humanitarian aid, including aid packages, blankets, a first aid kit, and food supply. Singapore sent 80 members of the civil defense force for rescue operations, elite personnel, and 4 dogs. Other countries that sent support for rescue operations are Malaysia, New Zealand, South Korea, Bangladesh, etc. Images of rescue operations are shown in Figure 6a and 6b. Bangladesh handed over 151.5 metric tons of emergency relief materials, including tents, food packets, medicines, water, hygiene kits, plastic sheets, mosquito nets, solar lights, and other essential supplies for the people of Myanmar affected by the devastating earthquake of 7.7 magnitude that struck northern Myanmar on 28 March 2025 (BD Connect 2025)

(a) (b)

Figure 5: Demonstration of Rescue Work (Saksornchai, 2025); (a) Workers using equipment to search for survivors under rubble, (b) Rescue teams working together at a collapsed building site.

3.3 Health and Safety Issues during Rescue Management

After the earthquake (*Enabling a Rapid Response: UNDSS and the Myanmar Earthquake*, n.d.), many victims suffered from serious injuries such as broken bones, head trauma, and deep cuts caused by falling debris and collapsed buildings, emergency shelters were very crowded and the risk of diseases increased because of limited clean water, immediate medical attention was provided by local and international NGOs after the earthquake, the scale of devastation is massive and humanitarian needs are urgent, special concern is given to vulnerable groups like children, displaced people, and women at risk of gender-based violence, more funds are needed to provide aid, restore services, and save lives, urgent help is being delivered by the IRC with local partners. In Myanmar, after the earthquake, it was very important to create emergency shelters because it made hundreds of thousands of people displaced, many people lost their homes and were forced to stay outside, that is why emergency shelter materials like tents, blankets, and other household items are urgently needed. In Mandalay, hospitals are overwhelmed, power supply damage has caused major electricity blackouts which affected the medical facilities, many people have to wait outside to take treatment, due to limited resources many survivors are unable to access medical treatment, hospitals are overwhelmed with trauma cases and many hospital buildings are unusable, patients are being treated on beds placed outside due to fears of buildings collapsing (rescue.org). Some actions were taken to prevent disease outbreaks, treat injuries, and ensure basic health and hygiene for affected victims, emergency medical camps and mobile clinics were deployed, some important vaccines are provided, basic hygiene kits and clean water were distributed to everyone, but even then more mobile health units have to be deployed for remote areas as well as areas where medical centers were collapsed or got damaged, more important medicines and vaccines must be supplied to prevent diseases, in addition, priority must be given to the health, food, and shelter of rescue workers.

5. Conclusions

The 2025 earthquake in Myanmar caused widespread destruction, loss of life, and serious health and safety challenges for both victims and rescue workers. Despite efforts from local and international teams, many difficulties, such as damaged infrastructure, delayed aid, and limited medical resources, slowed the response. Vulnerable groups like children, displaced families, and the injured faced the greatest risks. To strengthen future disaster response, Myanmar must adopt modern solutions. Early warning systems, earthquake-resistant buildings, and stronger infrastructure can help minimize damage. Mobile medical units, smart safety gear, and digital tracking tools can improve rescue speed and coordination. Mental health support is also crucial to help survivors and responders cope with trauma. Training local communities in first aid and basic rescue can enhance preparedness and reduce casualties. With better planning and technology, Myanmar can improve disaster resilience and save more lives. The Myanmar earthquake underscores the importance of implementing strict seismic codes, adopting risk-informed urban planning, and improving emergency readiness. Building resilient infrastructure and empowering communities are essential to minimize future earthquake risks.

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