The Myanmar Earthquake and Lessons Learnt for Malaysia

Mohamad Arief Azfar bin Mohd Ghazali

Introduction: A Wake-Up Call Beyond the Ring

On 28 March 2025, central Myanmar was struck by a 7.7 Richter scale magnitude earthquake, marking one of the deadliest seismic disasters in the country's modern history. With over 3354 confirmed fatalities and 4508 injured, the earthquake devastated the Sagaing region and severely impacted critical infrastructure[1]. Notably, the seismic waves reverberated far beyond Myanmar's borders. The earthquake tremor involved a large area which extended up to Bangkok, Thailand, and Yunn a province in China. The earthquake also triggered the collapse of an under-construction skyscraper in Bangkok, Thailand, which claimed 22 lives and injured 35 others[2], and causing structural damage as far as Yunnan province in China. The incident was followed by multiple aftershocks, including a 6.4 Richter scale magnitude tremor that complicated rescue efforts and further destabilised the already weakened structures.[3] While Myanmar is not traditionally considered part of the Pacific Ring of Fire, this seismic event underscores a critical point: the geography of risk is shifting, and the assumption that certain regions, including Malaysia, are insulated from major earthquakes warrants urgent reassessment. The magnitude and reach of the Myanmar earthquake have highlighted vulnerabilities in regional preparedness, particularly in urban safety standards, building resilience, and early warning systems. This article examines the strategic implications of the 2025 Myanmar earthquake, particularly for Malaysia. It argues that seismic threats, though traditionally viewed through a geological lens now fall squarely within the realm of contemporary security. The event leads a multidimensional policy response that includes reassessing building regulations, enhancing national disaster preparedness, and reinforcing coordination mechanisms both domestically and through ASEAN. Malaysia, while spared with the tremors, must learn from these lessons.

Triggering Factors and Regional Implications

Although the 2025 Myanmar earthquake occurred outside the traditional boundaries of the Pacific Ring of Fire, its geological basis is both complex and revealing. The epicentre of the quake was located along the Sagaing Fault, a major continental strike-slip fault that runs through the heart of Myanmar. This fault is approximately 1,200 kilometers in length, stretching from the eastern Himalayan foothills near India down to the Andaman Sea, cutting directly through major population centres like Mandalay and Yangon. The Sagaing Fault functions as the primary boundary between the Indian Plate and the Burma microplate, making it one of the most seismically active fault lines in mainland Southeast Asia. It accommodates the relative motion between these two tectonic blocks through horizontal, lateral movement, in what geologists term a right-lateral strike-slip motion.

The recent 2025 earthquake is believed to have been caused by a reactivation of this fault system, which occurs when built-up tectonic stress is released as the crustal blocks on either side of the fault suddenly move past one another. In this event, the movement was clockwise, with the western block shifting northward and the eastern bloc moving southward. This dynamic is consistent with broader plate tectonic forces, especially the ongoing convergence of the Indo-Australian Plate against the Eurasian Plate[3], which exerts pressure across the region

and redistributes stress along major fault zones like Sagaing. The reactivation of such a fault zone highlights the risk posed by inland fault systems, often under-monitored but capable of generating high-magnitude earthquakes. While these zones may exhibit low activity for decades, they can unleash significant energy once reactivated, resulting in widespread destruction.

From a regional security standpoint, the earthquake's impact in Thailand and China, both located hundreds of kilometres from the epicentre, demonstrates the transnational nature of seismic hazards. For Malaysia, which has its own lesser-known fault systems such as the Bentong-Raub and Bukit Tinggi faults, this event serves as a reminder that seismic risk must be addressed not just where activity is frequent, but where it is plausible.

Malaysia's Domestic Reality: Rethinking National Preparedness

Malaysia, historically perceived as seismically stable, has structured its urban development, infrastructure planning, and national security frameworks around the assumption of minimal earthquake risk. Nevertheless, the 2025 Myanmar earthquake, and its ripple effects across Southeast Asia, has brought this assumption into question. The reality is more nuanced and, as recent history suggests, potentially dangerous. A critical precedent is the 2015 Sabah earthquake, which struck near Mount Kinabalu with a magnitude of 6.0. The quake, though moderate in strength, resulted in 18 fatalities, mostly schoolchildren and teachers from Singapore on a hiking expedition, and caused severe damage to buildings, roads and tourist infrastructure. The incident shocked the nation, not only for its human toll but also for revealing the vulnerabilities in Malaysia's building codes and emergency response mechanisms. It served as a rare but potent reminder that seismic threats are not entirely foreign to Malaysia[4]. Yet, a decade later, systemic change is still limited. While the National Annex to Eurocode 8 (MS EN 1998-1:2015) was adopted following the Sabah quake to provide technical guidelines for earthquake-resistant design, enforcement stays inconsistent. The use of this standard is not mandatory across all development projects,[5] particularly in regions deemed insignificant risk, such as Peninsular Malaysia. In practice, this leaves high-rise developments, especially in major urban centres like Kuala Lumpur and Johor Bahru, potentially exposed to seismic events. Moreover, public awareness of earthquake preparedness remains low. Emergency drills seldom include earthquake scenarios, and civil defence planning is still largely oriented toward floods, landslides, and fires. While these remain pressing hazards, the Myanmar earthquake has shifted the strategic calculus. The structural integrity of buildings, the readiness of first responders, and the coordination of federal and state agencies must all be reassessed considering this emerging risk environment.

As Malaysia continues to urbanise, the need to future-proof national infrastructure and policy frameworks is no longer optional, it is imperative. Risk mapping, structural audits, and cross-agency collaboration must become integral to a new phase of disaster resilience, one that includes seismic threats as a core component of national security planning. There should be guidelines to ensure high rise buildings could withstand tremors up to at least 8 Richter scale magnitude.

Policy Considerations: Aligning Regulations with Seismic Realities

In the aftermath of the 2025 Myanmar earthquake, a key question emerges for Malaysia: are current national policies and regulatory frameworks sufficiently robust to withstand a similar

seismic event? While Malaysia has made progress in recognising seismic risks, implementation and alignment across institutions remain uneven.

1. Inconsistent Enforcement of Seismic Design Standards

Following the 2015 Sabah earthquake, Malaysia adopted the National Annex to Eurocode 8 (MS EN 1998-1:2015), a technical guideline for designing earthquake-resistant buildings. However, its application remains voluntary and uneven across states. This discretionary enforcement has led to significant variations in structural safety, particularly in high-rise developments within Peninsular Malaysia, where the perceived risk of seismic activity is low. The lack of a uniform mandate leaves critical infrastructure potentially vulnerable[5].

2. Limited Integration of Seismic Risk in Spatial Planning

Seismic hazards are still not fully embedded in Malaysia's urban planning frameworks. While geological surveys have been conducted in selected regions, the findings are not consistently translated into zoning laws or construction restrictions[4]. This gap is particularly concerning as urban expansion continues in areas such as Sabah and Sarawak, which lie closer to known fault lines. The absence of formalised seismic risk zones in the National Physical Plan and State Structure Plans suggests a reactive, rather than anticipatory, policy stance.

National Disaster Coordination: Malaysia's NADMA Framework

Malaysia's disaster response strategy is anchored by the National Disaster Management Agency (NADMA), established in 2015 under the Prime Minister's Department. Its current legal and operational framework is guided by NADMA Instruction No. 1/2024, which replaces the earlier Directive No. 20 (Arahan No. 20)[6]. This updated instruction formalises the structure of national disaster response by clearly defining the roles and responsibilities of federal ministries, state agencies, and district-level authorities under NADMA's leadership.

NADMA Instruction No. 1/2024 reflects a shift from a centralised command model toward a more integrated and multi-agency coordinated approach. It strengthens coordination mechanisms among security forces, civil service agencies, local governments and technical departments. This modernisation is critical in addressing increasingly complex disaster environments, including climate-related hazards, public health emergencies, and potential seismic events[6].

The operational flow under this framework activates key agencies based on the nature of the disaster:

1. The Public Works Department (*Jabatan Kerja Raya* - JKR) assesses infrastructure damage and supports rehabilitation.
2. The Fire and Rescue Department (*Bomba*) leads urban search-and-rescue operations.
3. The Royal Malaysia Police (*Polis DiRaja Malaysia* - PDRM) and Malaysian Armed Forces (*Angkatan Tentera Malaysia* - ATM) assist with security, logistics, and mass evacuation.
4. State and District Disaster Management Committees serve as the frontline implementers at the sub-national level.

While Malaysia has tested these structures during recurring disasters such as floods, earthquake-specific preparedness remains underdeveloped, particularly in Peninsular Malaysia. The 2015 Sabah earthquake served as a wake-up call, but routine seismic drills, specialised rapid deployment training, and technical capacity (such as ground motion monitoring) are still limited[6].

NADMA Instruction No. 1/2024 provides a clearer, updated policy foundation, but effective disaster response continues to rely heavily on inter-agency coordination, resource readiness, and the ability to operationalise plans in real-time[6].

ASEAN's Role in Regional Disaster Management

At the regional level, Malaysia is part of ASEAN's growing Humanitarian Assistance and Disaster Relief (HADR) architecture. The key framework is the ASEAN Agreement on Disaster Management and Emergency Response (AADMER), a legally binding commitment signed in 2005 and in force since 2009[7]. Under AADMER, the ASEAN Coordinating Centre for Humanitarian Assistance (AHA Centre) acts as the operational hub. It coordinates aid deployment, information management and regional logistics. Malaysia contributes through ASEAN's Standby Arrangements and regularly participates in simulation exercises such as ARDEX and ASEAN-ERAT deployments, which enhance interoperability[8].

ASEAN's operational protocol for disaster response is SASOP (Standard Operating Procedure for Regional Standby Arrangements and Coordination of Joint Disaster Relief and Emergency Response Operations). It outlines how member states can request and provide disaster assistance while ensuring alignment between civilian and military actors.[8] ASEAN's HADR framework increasingly involves military support. As noted by RSIS, Southeast Asian militaries play a central role due to their mobility, logistics capacity, and infrastructure, including aircraft, transport fleets, and medical teams.[9] Exercises such as Ex COORES and ASEAN-focused ARF drills have improved regional trust and operational coordination.

However, the ASEAN system still faces practical constraints:

1. The speed of deployment depends heavily on political clearance from affected governments.
2. Information sharing across agencies remains inconsistent, particularly where military involvement is concerned.
3. Funding mechanisms rely on donor contributions and are often reactive, not pre-emptive.

Malaysia's leadership in disaster diplomacy, technical expertise and participation in regional drills positions to help advance ASEAN's operational readiness and policy coherence.

Regionally, Malaysia is embedded within ASEAN's expanding Humanitarian Assistance and Disaster Relief (HADR) ecosystem. The cornerstone is the ASEAN Agreement on Disaster Management and Emergency Response (AADMER), a legally binding framework signed in 2005 and in force since 2009, establishing a common platform for coordination and response[8]. Under AADMER, the ASEAN Coordinating Centre for Humanitarian Assistance (AHA Centre) serves as the regional hub, coordinating aid deployment, data management and logistics. Malaysia actively contributes to this system through ASEAN's Standby Arrangements and has participated in simulation exercises such as ARDEX (ASEAN Regional

Disaster Emergency Response Exercise) and ASEAN-ERAT deployments, which enhance operational readiness[8].

A key operational document is SASOP (Standard Operating Procedure for Regional Standby Arrangements and Coordination of Joint Disaster Relief and Emergency Response Operations). It outlines how ASEAN members initiate, accept, provide disaster relief and, addressing military and civilian coordination[8].

Beyond institutional frameworks, ASEAN's approach increasingly involves militaries. As RSIS highlights, Southeast Asian militaries remain central players in HADR due to their assets, reach, and strategic mobility (e.g., C-130s, field hospitals)[9]. Exercises like Ex COORES and HADR-focused ARF drills are helping build trust and technical interoperability.

Despite these strengths, ASEAN still faces limitations:

1. Deployment speed is dependent on political consent and bureaucratic clearance.
2. Information sharing remains fragmented, especially when military assets are involved.
3. Funding mechanisms are donor-dependent and often reactive rather than pre-emptive.

Malaysia's continued leadership in ASEAN disaster exercises, information-sharing platforms, and its role in HADR diplomacy offer opportunities to strengthen regional trust and fast-track operational coordination.

Lessons Learned

The 2025 Myanmar earthquake, alongside Malaysia's own experience during the 2015 Sabah quake, provides critical takeaways for our national disaster readiness. These are not just technical lessons that reflect deeper institutional and strategic gaps that must be addressed.

1. Seismic Threats Are No Longer Theoretical

For too long, Malaysia's development planning has treated earthquakes as rare events that only affect other parts of the region. The recent Myanmar event, which shook buildings as far as Thailand and Yunnan, China, proves otherwise. Local fault lines like the Bentong-Raub fault are poorly understood and barely monitored[4]. Without proactive seismic mapping and risk modelling, urban planners, architects, and emergency managers are working blind. Seismic hazard must be integrated into national infrastructure strategy, not only in Sabah, but across Peninsular Malaysia.

2. We Have the Right Frameworks, but Weak Compliance

Directive No. 20 outlines a solid command structure[6]. The Eurocode 8 standard provides clear seismic design criteria[5]. But in practice, building compliance remains voluntary in most states. Earthquake drills are rare, and NADMA-led simulations tend to focus on flood scenarios. This weakens preparedness across agencies and at the municipal level. What is missing is mandatory enforcement and consistent training across agencies, especially for urban local authorities and emergency services.

3. ASEAN cooperation though exists, but it is underutilised

Malaysia is part of a strong regional system under AADMER and the AHA Centre[7]. Simulation exercises like ARDEX are useful, and frameworks like SASOP provide structure[10]. But during real crises, response times are often delayed due to bureaucratic processes and state-by-state discretion. For ASEAN to succeed in rapid disaster mobilisation, countries like Malaysia must take the lead in pushing for clearer joint protocols, pre-positioned assets, and interoperability between civilian and military responders. Malaysia has the operational experience, but it must also drive political momentum in ASEAN platforms[4].

4. Earthquake Readiness is a Strategic Security Imperative

Natural disasters are not just humanitarian or logistical issues. They test the legitimacy of government institutions, strain national unity, and disrupt economic stability. A poorly handled disaster can trigger mass displacement, erode investor confidence, and expose systemic inequality. Earthquake preparedness must be reframed as a national security issue that involves infrastructure resilience, inter-agency trust and civil-military coordination. As RSIS points out, civil-military synergy is essential in disaster response, yet remains weakly institutionalised in Southeast Asia[9]. Malaysia must invest in both doctrine and field capability, treating seismic resilience as a core pillar of national strategy.

Conclusion: A Strategic Wake-Up Call for Malaysia

The 2025 Myanmar earthquake has brought into sharp focus the evolving nature of regional security threats, particularly those that lie outside the conventional lens of geopolitics and conflict. With over 1,250 lives lost, transnational aftershocks and cascading infrastructure failures, the event underscores a critical reality: seismic risk is no longer confined to the Pacific Ring of Fire, nor can it be treated as a distant concern[3].

For Malaysia, this is a moment of strategic reflection. The 2015 Sabah earthquake exposed underlying policy gaps, and the Myanmar disaster reaffirms the urgency of change. Moving forward, regulatory enforcement, urban planning integration and regional coordination must all evolve to reflect a more dangerous and unpredictable seismic landscape.

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