



## ASEAN Socio-Cultural Community POLICY BRIEF

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### EXECUTIVE SUMMARY

- Systemic risks have transformed disaster risk landscape in Southeast Asia, amplifying both the intensity and frequency of geological and hydrometeorological hazards which are predicted to increase from around 400 in 2015 to 560 per year by 2030. This in turn exacerbate existing vulnerabilities to disasters.
- ASEAN has shown great progress in disaster management and emergency responses. Nevertheless, ASEAN could benefit from strengthened disaster risk governance, utilization of new technologies, risk diagnostic and modelling, and innovative financing for disaster management.
- Understanding systemic risks and overcoming resilience challenges by adopting the Whole-of-ASEAN approach is key to achieving systemic resilience and delivering sustainable development in the ASEAN region.

### POLICY RECOMMENDATIONS

- Adopt Whole-of-ASEAN approaches to strengthen regional resilience and advance sustainable development in the ASEAN region.
- Establish the ASEAN Regional Disaster Resilience Platform (ADRP) to enable cross-pillar and cross-level coordination to address institutional issues in dealing with and anticipating disaster risks. This is however contingent upon existence of clear governance structure to coordinate action across multiple institutions.
- Invest in inclusive, systemic, and measurable probabilistic risk diagnostic and modeling using new and innovative technologies to enable better risk understanding in a probabilistic manner, and in building and planning for resilience in addressing complexities and uncertainty.
- Utilize existing ASEAN's disaster management tools and mechanisms particularly the Southeast Asia Disaster Risk Insurance Facility, and beyond to overcome limited access to and innovation of disaster risk finance and insurance.

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## Common Resilience Challenges in ASEAN and Potential Areas of Collaboration in Disaster Management

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### Introduction: Changing Disaster Risk Landscape in ASEAN

The ASEAN region is considered one of the most vulnerable regions to natural disasters and is experiencing more frequent and intense disasters due to climate change. Disasters, climate change, loss of biodiversity, public health emergencies, ageing population, ageing infrastructure, displacement and migration, conflicts, and extreme poverty continue to threaten the pursuit of resilience and sustainable development globally, including in the ASEAN region. These risks are getting more complex, systemic and interconnected.

The recently published Global Assessment Report on Disaster Risk Reduction stated that:

*Despite commitments to build resilience, tackle climate change and create sustainable development pathways, current societal, political, and economic choices are doing the reverse. This jeopardizes not*

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*only the achievement of the Sendai Framework for Disaster Risk Reduction 2015-2030 but also hinders progress toward the Paris Agreement, and the Sustainable Development Goals (SDGs) set out in Transforming our World: the 2030 Agenda for Sustainable Development.*<sup>2</sup>

This situation may equally be applicable to ASEAN where the progress of the ASEAN Vision 2025 on Disaster Management, and the goals and targets of ASEAN Agreement on Disaster Management and Emergency Response (AADMER) Work Programme (AWP) 2021-2025 or other SDG-related programmes may have slowed and may take more time to achieve.

The number of disasters per year in the region may increase from around 400 in 2015 to 560 per year by 2030 or a projected increase of 40%. In regard to geological hazards, Indonesia, for example, faces the highest risk based on the Database, where around 99 landslides, 61 earthquakes, 29 hazardous volcanic activities, and two tsunamis have been reported in the last ten years. The Philippines, as another example, also reported a significant number of geology and geology-weather-induced disaster, at least nine disastrous volcanic activities, 25 earthquakes, and 13 landslides that occurred in the Philippines from 2012 to 2022.<sup>3</sup>

The number of extreme temperature events per year is also increasing and will almost triple between 2001 and 2030.<sup>4</sup> ASEAN Disaster Information Network (ADINet) record shows that weather and climate-induced disasters were the most common

type of disasters in Southeast Asia. There have been 3,190 weather disaster events (including floods, severe local storms, tropical cyclones, storm surges, and drought) reported in the ASEAN region since 2012. Among the countries in which these types of hazards have been reported, Indonesia is the most highly prone to floods, with at least 1,935 events occurring in the last ten years, followed by the Philippines with 149 events and Malaysia with 115 events. Wind-related disasters frequently happen in Indonesia, the Philippines, Viet Nam, and Thailand, with 393 events occurring from 2012 to 2022. The Philippines also faces significant threats from tropical depressions that produce tropical storms. Around 74 such events were reported in the Philippines, along with at least 38 tropical cyclones, all occurring over the last ten years.

The Intergovernmental Panel on Climate Change (IPCC) AR6 report suggests that hydrometeorological hazards are the biggest threat in Southeast Asia amongst all the other varied impacts of climate change. Under all climate change scenarios, and in comparison to global averages, Southeast Asia will be most impacted by heavy precipitation, followed by drought, hot temperatures/heatwaves, and warming winds causing intensified tropical cyclones.<sup>5</sup> Livelihoods in areas prone to cyclones, such as several states and provinces in Malaysia, the Philippines, and Viet Nam, are potentially exposed to land degradation as cascading effects from sea-level rise events combine with higher intensity cyclones. The increasing temperature will impact areas with drier soil, such as some areas in Indonesia and Thailand, to experience more formidable heat waves (Pereira and Shaw, 2022). Coastal communities, especially those with low-altitude fisheries as their main

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2 UNDRR (2022). Global Assessment Report on Disaster Risk Reduction 2022: Our World at Risk: Transforming Governance for a Resilient Future. Summary for Policymakers. Geneva: United Nations Office for Disaster Risk Reduction.

3 ASEAN Disaster Information Network (ADINet) by AHA Centre (<https://adinet.ahacentre.org/>) accessed on 06 June 2022

4 *Ibid.*

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5 ESCAP (2022). Asia-Pacific Riskscape @ 1.5°C: Subregional Pathways for Adaptation and Resilience. Bangkok: UN-ESCAP.

livelihoods in nine ASEAN Member States, will experience higher tide lines, reducing the quality and quantity of fish farms and forcing them to relocate (Bisri, 2020). These climate-related phenomena drive cascading threats that need to be assessed and mitigated against, from many perspectives.

Most of the countries that face high disaster risks are also those with a significant amount of their population living under the poverty line. Among the top-20 countries with high disaster risks, four are ASEAN Member States with a share of more than 10% of their population living under the national poverty line. They are the Philippines, Myanmar, Indonesia, and Viet Nam.<sup>6</sup> Meanwhile, the economic implications of disasters have been reported for some ASEAN Member States, including Indonesia, Malaysia, Thailand, the Philippines, and Viet Nam. A study stated that the adaptation cost for climate-related hazards and biological hazards will be around 0.57% of the total Gross Domestic Product (GDP) of the region.<sup>7</sup>

### Systemic Risks: Emerging Examples from the ASEAN region

Understanding the nature of systemic risks and cascading hazards will enable better disaster risk reduction and management. By definition, systemic risk is:

*risk that [is] endogenous to, or embedded in, a system that in itself is not considered as a risk and therefore not generally tracked or managed but could be understood through systems analysis to paint the picture of latent or cumulative risk potentially having negative*

*impacts to the overall system performance when some characteristics of the system change.*<sup>8</sup>

While cascading hazard is defined as “...processes that refer to a primary impact (trigger), such as heavy rainfall, seismic activity or unexpectedly rapid snow melt, followed by a chain of consequences that can cause secondary impacts”.<sup>9</sup>

Taking an example from the ASEAN region, the 2018 Central Sulawesi Earthquake, Liquefaction and Tsunami, can be classified as systemic risks and cascading hazards triggering catastrophic disaster. The disaster impacted significantly on several countries socio-economic, environmental and political systems. More than 4,000 fatalities were recorded along with a total around \$1.3 million in losses. Transportation and water infrastructures were damaged badly, resulting in total chaos within the agricultural sector. Irrigation systems were damaged and slope instability indirectly contributed to subsequent hazards, such as flash floods. Besides the disaster event itself, the ineffectiveness of existing early warning systems for tsunami detection (seismographic sensors, buoys, tidal gauges, GPS) was suspected of contributing to the high number of losses<sup>10</sup> Prevention, mitigation, and preparedness prior the disaster also underscored the knowledge gap in systemic risk comprehension and challenges in risk-assessment mechanisms, mainly in resilient infrastructure provision and resilient spatial planning (Sagala et al., 2021). During the acute humanitarian situation triggered by this

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6 See INFORM Index by European Commission (2021) and UN DESA (2021)

7 Op. Cit. ESCAP (2022).

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8 UNDRR (2019), Global Assessment Report on Disaster Risk Reduction, Geneva, Switzerland, United Nations Office for Disaster Risk Reduction (UNDRR)

9 Op. Cit. UNDRR (2019).

10 UNDRR (2022), Scoping Study on Compound, Cascading and Systemic Risks in the Asia Pacific, United Nations Office for Disaster Risk Reduction (UNDRR).

disaster, ASEAN as a regional body assisted through the provision of humanitarian assistance, deployment of the ASEAN-Emergency Response and Assessment Team (ERAT), coordination, and information management support. Through the AHA Centre, ASEAN extended its support towards recovery activities, including the development of the ASEAN Village to bring recovery for the society.<sup>11</sup>

Another example of a systemic risk is the COVID-19 pandemic and its implications to livelihoods, health, recovery and resilience. As of 6 June 2022, the pandemic impacted 532 million people globally and caused 6.3 million deaths.<sup>12</sup> A greater number of people were infected, some lost their lives, and others lost their livelihoods due to the ensuing disruption. The public health response to COVID-19, despite eventually bringing success after two years, also caused some negative externalities. For instance, the usage of medical equipment, including obligatory masks, has led to new environmental issues, such as the accumulation and poor disposal of medical waste. In addition, people suffering from long-COVID symptoms, will likely experience long-term quality of health issues.

Changes in behavior within society slowly disrupted Covid-19 transmission. Quarantine, various health protocols, and social distancing hit various businesses and industries hard, which in turn placed impact upon vulnerable communities. Since companies were also struggling, unemployment rose. The World Bank estimated the direct and indirect effects of COVID-19 had pushed 97 million

more people into poverty.<sup>13</sup> Staying at home also caused a Shadow Pandemic. A United Nations Office for Disaster Risk Reduction (UNDRR) report stated abuse and family violence had increased around the world since social isolation and quarantine measures came into force<sup>14</sup> with few opportunities for people living with family violence able to get help.

As another consequence of the COVID -19 pandemic, people were forced to adapt to the online lifestyle. For example, schools were forced to switch to alternative teaching methods such as online courses. 75% of students reported that their lives had become more difficult and 50% felt that learning outcomes were harder to achieve due to the sudden switch to online teaching (Usher et al., 2020). In the 12 weeks after the closure, the corresponding figures were 57% and 71% (Almendingen et al., 2021). Disruptions in the education system could have an impact on the learning process and the psychological situation of young people. The industry and workers had to adjust to the online system. Those in the tourism sector and in smaller economies have had difficulties in retaining their incomes. The tourism sector may have tried the virtual tour, but smaller economies received little benefit and were left out economically. In terms of political and security implications, the online lifestyle has facilitated the distribution and creation of misinformation, which has affected public trust in governments.

The 2020 COVID-19 pandemic has taken its toll on the economies and societies of Southeast Asia. The sudden increase in cases of the disease caused the first economic decline in the last 22 years, and a recession is expected for most ASEAN Member States in 2020. Public health measures, as well as

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11 Administrative handover of the ASEAN Village Phase 2: Bring festive of Ramadhan and excitement to the community - Indonesia. ReliefWeb. (2021, June 11). Retrieved June 6, 2022, from <https://reliefweb.int/report/indonesia/administrative-handover-asean-village-phase-2-bring-festive-ramadhan-and-excitement>

12 Covid-19 data explorer. Our World in Data. (n.d.). Retrieved June 6, 2022, from <https://ourworldindata.org/explorers/coronavirus-data-explorer>

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13 Op. Cit. UNDRR (2022)

14 *Ibid.*

social restrictions and border controls, disrupted productive activities and trade and tourism, particularly affecting vulnerable groups such as children, the elderly, the poor and marginalised groups. The pandemic also exposed the gaps in the multilateral agenda and highlighted the gaps in ASEAN's cross-sectoral and cross-pillar initiatives in responding to the unprecedented event.

Another case of systemic risk is climate change. Based on the report of the Sixth Assessment of the IPCC, there are more frequent and intense extreme climatic events occurring in many parts of the world.<sup>15</sup> The report also highlights that the overall impacts are becoming increasingly complex and cascading across sectors.<sup>16</sup> Meanwhile, in ASEAN, climate change was ranked as one of the top three security issues in 2019 (Seah et al., 2021). Climate change was seen as a direct threat by 53.7% of Southeast Asians in 2020, a 1% increase from 2019, as the region was affected by several catastrophic events that year. The ASEAN region is projected to lose more than 35% of its GDP to climate change and natural disasters by 2050 (Renaud et al., 2021). This will have severe impacts on key sectors such as agriculture, tourism and fisheries, as well as on human health and labour productivity. The countries in ASEAN most at risk from climate change are Myanmar (ranked second globally), the Philippines (ranked fourth) and Thailand (ranked ninth) over the period 2000-2019 (Eckstein et al., 2021). The survey results of the Southeast Asia Climate Outlook 2021 also show that flooding, biodiversity loss and sea level rise are the top three impacts of climate change in ASEAN.<sup>17</sup>

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15 IPCC. Regional fact sheet - Asia2021. Available from: [https://www.ipcc.ch/report/ar6/wg1/downloads/factsheets/IPCC\\_AR6\\_WGI\\_Regional\\_Fact\\_Sheet\\_Asia.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/factsheets/IPCC_AR6_WGI_Regional_Fact_Sheet_Asia.pdf).

16 *Ibid.*

17 Op. Cit. Seah, S. et al (2021)

ASEAN is also confronted with another problem, namely the mobility and displacement of people caused, among other things, by natural disasters. Data collected by the Internal Displacement Monitoring Centre (IDMC) from 2015 to 2018 shows that the impact of disasters in ASEAN Member States has caused the displacement of more than 21 million people in total, and more than four million people are displaced every year.<sup>18</sup>

The ASEAN Member States with the highest number of people displaced due to disasters are the Philippines, Myanmar, Indonesia and Vietnam.<sup>19</sup> In recent years, people have been displaced due to disasters mainly due to hydrometeorological disasters, especially floods and tropical cyclones. About 87% of displacements of people globally in 2008 - 2018 were due to the impact of hydrometeorological disasters.<sup>20</sup> Flooding is the largest contributor to displacement from hydrometeorological disasters, followed by tropical cyclones. In 2011, Thailand was hit by floods and about 1.5 million people were displaced (IDMC and NRC, 2012). In the Philippines, Super Typhoon Haiyan hit in 2013, killing over 7,000 people and displacing more than 4 million (Sherwood et al., 2015). The response to Typhoon Haiyan highlighted the complexity of the political dynamics in the post-disaster phase and there were several aspects that have not been considered in the context of displacement and the sustainable solution process in the post-disaster context: the gender dimensions of forced displacements, challenges surrounding the search for durable solutions in rural environments, and the role of local governments in supporting solutions for

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18 ARMOR 2019

19 *Ibid.*

20 IDMC. (2019b, May). Disaster displacement: A global review, 2008 – 2018: Thematic report. Geneva, Switzerland: Internal Displacement Monitoring Centre

displaced people. For example, government and aid agencies' lack of efficient processes in dealing with forced displacements as a result of Typhoon Haiyan were due to a lack of human and financial resources and training, including in relation to major disaster response and displacement-related standards, difficulty coordinating the entry of massive aid after a disaster; and tensions between different interests and visions for reconstruction.<sup>21</sup>

### Three Resilience Challenges: Lack of Institutional Coherence, Lack of Use of Frontier Analysis and Technologies, and Limited Scope of Disaster Finance and Insurance

This Policy Brief identifies three resilience challenges that affect all three pillars of ASEAN (political security, economic, and socio-cultural), namely:

1. **Institution: Lack of coordinated and integrated approach amongst ASEAN institutions in dealing with and anticipating disaster risks.** Over the past years, awareness and risk reduction activities within institutions have increased; however, a better-coordinated effort across institutions is necessary.
2. **Frontier analysis and technology: Lack of use of frontier analysis and technologies for multi-hazards risk assessment, preparedness, early warning systems, and response operations.** With the proliferation of frontier technologies, this is necessary to anticipate and effectively respond to systemic and cascading disasters.
3. **Disaster Risk Finance and Insurance: Limited access to and innovation of disaster risk finance and insurance.** This originates from the absence of complete risk valuation across levels, limited probabilistic risk assessment availability, and limited availability and access to necessary parametric insurance provision.

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<sup>21</sup> *Op. Cit. Sherwood et al (2015)*

This Policy Brief argues that in order to equip ASEAN to be better prepared to respond to systemic risk is to transform the current institutional systems and develop policies and determine actions to work more closely together through whole-ASEAN approaches that empower cross-sectoral and cross-pillars collaboration. Accordingly, the decision to enhance the Joint Task Force on Humanitarian Assistance and Disaster Relief (JTF-HADR)<sup>22</sup> into the ASEAN Disaster Resilience Platform (ADRP) is an essential step in transforming ASEAN into resilience.

#### **1. Institution: Lack of Coordinated and Integrated Approach amongst ASEAN Institutions in Dealing with and Anticipating Disaster Risks.**

The ASEAN architecture and institutions are not ready to keep up with the risk. Across the sectors and pillars of ASEAN, there are silos and disconnections. The disaster management sector portfolio has not yet been utilised by other sectors/pillars. At the same time, vulnerable and affected people are not directly involved in decision-making processes. This is not only true for ASEAN, but also for other regional cooperation in the Asia-Pacific region.<sup>23</sup> Necessary adjustments across sectors/pillars are urgently needed. This is therefore the objective of conducting the “Mapping Exercise to Promote Synergy with Other Relevant Sectoral Bodies, ASEAN Centres, and Entities Associated with ASEAN on Disaster Management” in 2021. The result of the mapping exercise clearly showed the

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<sup>22</sup> The Joint Task Force on Humanitarian Assistance and Disaster Relief was created in 2014, to promote synergy between relevant ASEAN bodies on HADR (ASEAN HADR mechanisms). The ACDM has been designated as the lead ASEAN group for the JTF and the chair of the ACDM heads these meetings. The JTF involves four ASEAN sectoral bodies: the Senior Officials Meeting (SOM); ASEAN Defence Senior Officials Meeting (ADSOM); Senior Officials Meeting on Health Development (SOMHD); and Senior Officials Meeting on Social Welfare Development (SOMSWD), representing ministries from Foreign Affairs, Military/ Defence, Health, and Social Welfare.

<sup>23</sup> *Op. Cit. ESCAP (2022).*

need for genuine resilience-building through cross-sector/pillar collaboration, and the expansion of the JTF-HADR portfolio.<sup>24</sup> The exercise also revealed that about 26 of the 46 ASEAN Sectoral Bodies are relevant to disaster management, of which five are currently members of JTF on HADR, including the AHA Centre which is an existing member. Nine of the 16 ASEAN Centres, have functions relevant to disaster management. These Sectoral Bodies and Centres represent all three pillars of the ASEAN Community. In addition, 20 out of 77 Entities associated with ASEAN are relevant to the JTF on HADR. The ASEAN Foundation, as an ASEAN organ, has also been identified as highly relevant for cooperation to promote a whole-of-ASEAN approach to disaster management. Collectively, the identified functions of ASEAN Sectoral Bodies, Centres, and Entities associated with ASEAN as well as the ASEAN Foundation, cover all phases of disaster management and essentially is the ‘best bet’ for collective and systemic resilience-building.

ASEAN’s footprint through the disaster management sector for resilience-building is substantial: the AADMER and the establishment of the ASEAN Coordinating Centre for Humanitarian Assistance on disaster management (AHA Centre) as the regional coordinating agency, ASEAN Vision 2025 on Disaster Management, and AADMER Work Programme series have all led to various signature programs and projects including the ASEAN-Emergency Response and Assessment Team/ERAT, Risk and Vulnerability Assessment/RVA, Disaster Monitoring and Response System/DMRS, Disaster Emergency Logistics System of ASEAN/DELSA, various ICT-based systems, and assets), One ASEAN One Response declaration, Technical Working Group (TWG) on civil-military,

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24 ASEAN (2021a). ASEAN Mapping Exercise to Promote Synergy with Other Relevant Sectoral Bodies, ASEAN Centres, and Entities Associated with ASEAN on Disaster Management. Jakarta: Association of Southeast Asian Nations.

TWG on Protection Gender and Social Inclusion, and the creation of the Joint Task Force to Promote Synergy with Other Relevant ASEAN Bodies on Humanitarian Assistance and Disaster Relief (JTF on HADR) – which in 2022, was replaced by ASEAN Disaster Resilience Platform for expanding the reach and contributions from various ASEAN Sectoral Bodies, ASEAN Centres and Entities.

These bodies and efforts show the journey travelled by ASEAN in reducing risk. However, the resilience goals are still out of reach and will only be reached if better and more inclusive partnerships, as well as collaborations exist.

At the operational level in the emergency response phase, ASEAN has conducted over 30 emergency responses in seven member states using its response tools and mechanisms.

Although ASEAN’s disaster response portfolio is well established in the region, ASEAN’s response to Tropical Storm Son-Tinh and the dam breach in Lao PDR in 2018 has provided interesting lessons on the need to improve ASEAN’s risk assessment, monitoring, analysis and cooperation with other relevant organisations. Although the Centre AHA managed to deploy its team to provide assessment, information management and coordination support, as well as DELSA assistance following a request for assistance from the Government of the Lao People’s Democratic Republic, the Centre did not anticipate the dam burst. Lessons learned: First, it is recommended that rural risks and vulnerability assessments, including key infrastructure, be included in the DMRS to support ASEAN decision-making (AHA Centre, 2019). Second, it is recommended that the parameters of the ERO guidelines be updated to better reflect the severity of disasters and design appropriate responses.<sup>25</sup> Thirdly, it is considered important to work with a relevant agency such as

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25 AHA Centre’s After-Action Review (2018)

the Mekong River Commission (MRC) as a key player in monitoring floods in Lao PDR, Thailand and Cambodia.

DELSA's development path also shows that progress is only in the area of disaster management. It is encouraging to see how DELSA is continuously expanding with the increasing number and type of relief items, the network of warehouses and the new web-based system. However, there is a lack of stocks and supplies used by ASEAN companies. In addition, the rapid delivery of relief goods is delayed and there are no procedures and channels for speeding up humanitarian assistance by waiving or shortening customs, inspection and quarantine procedures of each member state. Furthermore, not using DELSA is also a missed opportunity for cross-sectoral and cross-pillar cooperation. If the expansion of DELSA and cross-sectoral or cross-pillar collaboration had been pursued after dealing with numerous emergencies, ASEAN could have further contributed to accelerating vaccine distribution for COVID -19 (Kliem, 2021). Of course, it was due to the lack of a cold chain (technical issues), but it could also be argued that it was more due to the unwillingness of relevant actors to make a timely political decision that could pave the way for technical solutions that could improve disaster response (Gong and Nanthini, 2020).

Coordination, integration, and creation of initiatives across sectors or pillars that address resilience building and mandates of each sector take time. A case in point would be the interface between the AHA Centre and ASEAN Network Regulatory Bodies on Atomic Energy (ASEANTOM). With the background of preparation and implementation of ARDEX-18, which incorporates a scenario of cascading disasters involving earthquake, tsunami, and natural hazards triggering technological disasters (Natech) in the form of the release of hazardous materials, AHA Centre and ASEANTOM have several technical exchanges to explore better

risk monitoring to anticipate such instances and enhancing preparedness. Despite only a handful of critical facilities in ASEAN storing radioactive and atomic materials, some still could trigger a Natech disaster, such as in Manila, the Philippines, or in Serpong, Indonesia. This is not to mention other similar scenarios from a release of other biological, chemical, or explosive materials. However, despite positive initial exchanges, after more than three years of ARDEX-18, ASEAN DMRS has yet to include an active data feed from ASEANTOM monitoring capabilities and ASEAN has not yet expanded ASEAN-ERAT roster or AJDRP module to include capabilities similar to the International Atomic Energy Agency (IAEA)'s Response and Assistance Network (RANET) team. Both ideas were identified in 2018 as easy opportunities.

On capacity-building programmes, there is still a long way for harmonious linkages between ASEAN-ERAT, local capacity building programme, AHA Centre Executive Programme (ACE Programme), and The ASEAN Standards and Certification for Experts in Disaster Management (ASCEND).<sup>26</sup> Despite its quite substantial number of members, ASEAN-ERAT talent pools continue to be underutilised. This under-utilised number of ASEAN-ERAT can be a good indication and an alarm for ASEAN to re-navigate the pool. Lack of ASEAN-ERAT deployment may be a sign of the strong capacity of ASEAN Member States (AMS) to lead and manage the response. However, the frequency of generating the members in comparison to the number of deployments may not be efficient and should be revisited to better serve as a reinforcement for the AMS without overlooking

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26 The ASEAN Standards and Certification for Experts in Disaster Management (ASCEND) is an initiative by the ASEAN Member States to enhance the quality of human resources in disaster management by establishing a common set of standard skills and competencies, along with its validation process. See <https://ahacentre.org/publication/ascend-brochure/>



the AMS' resources. There was also a pilot project to localise ASEAN-ERAT system according to the specific needs and context of a particular AMS. However, given the numerous capacity building programs run by the AHA Centre, it is deemed necessary to review and ensure the linkage in order to avoid overlapping/or redundancy. The ARDEX series continue only to become a show of force and not address the principal factors of collective preparedness while at the same time still limited to those familiar with the disaster management sector. The potential of digital technologies for breaking these silos is also still under-utilised and not reaching a mature stage.<sup>27</sup>

## **2. Frontier Analyses and Technology: Lack of Use of Frontier Analysis and Technologies for Multi-Hazards Risk Assessment, Preparedness, Early Warning Systems, and Response Operations.**

ASEAN and ASEAN Member States have done a multitude of risk assessments, monitoring and analysis for informing preparedness planning, early warning provisions, and emergency response efforts using various degrees of technologies application and analyses. This is because disaster-relevant data readiness and quality, analytical skills, and technological capabilities are not equally acquired by all relevant actors. Meanwhile, analysis and technology are crucial to understanding the transformation of natural hazards into disasters.

For instance, in the preparedness phase, concepts and technologies in various Early Warning System (EWS) are not entirely new technology, but they still fail to reduce risks. In the case of Tropical Storm Son-Tinh which caused a dam break in Lao PDR in July 2018, the AHA Centre EOC encountered a time lag between three and four hours before the

dam break as the information did not feed to the ASEAN's DMRS and LAO PDR's National Warning Centre website was interrupted. The data stream from dam monitoring tools managed by the Mekong River Commission was also not linked to ASEAN's DMRS. The AHA knew the storm's track, wind, rainfall intensity and flooding potential as it passed through the Philippines, Vietnam and eventually the Lao People's Democratic Republic. The lack of a critical technology component that can link different EWS and relevant sectoral information at national and regional levels allowed for a preliminary analysis to anticipate the cascading effects of the storm (e.g. flash floods due to dam breaches), which was not possible at the time.

Likewise, the failure of a system also happened during the Central Sulawesi Earthquake and Tsunami in 2018, where while Indonesia Tsunami Early Warning System issued warning bulletins. However, they did not reach the communities in the affected areas.<sup>28</sup> In this case, Indonesian Agency for Geophysics, Meteorological, and Climatology (BMKG) issued a tsunami early warning five minutes after the earthquake. This is in accordance with their SOP. However, the tsunami arrived sooner than that. In addition, BMKG's calculation of the tsunami's height was lower than the actual height. The height variation was attributed to the causal mechanism of the Palu tsunami, which was triggered by a submarine landslide – a scenario not officially recognized. To sum up, EWS still remains vital and thus, there is an urgent need to invest more in improving national and regional EWS to enhance preparedness.

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27 See ICT Phase IV Project Evaluation report, AHA Centre, 2022.

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28 UNDRR and UNESCO-IOC (2019), Limitations and Challenges of Early Warning Systems: A Case Study of the 2018 Palu-Donggala Tsunami. United Nations Office for Disaster Risk Reduction (UNDRR), Regional Office for Asia and the Pacific, and the Intergovernmental Oceanographic Commission of United Nations Educational, Scientific and Cultural Organization. (IOC Technical Series N° 150)

In disaster response, satellite-based information and aerial surveillance by Unmanned Aerial Vehicles (UAVs) or drones play an important role in providing an accurate and timely situational picture after a disaster. However, there is still a mixed technical understanding among disaster managers of the different features and benefits of these technologies and how to access and analyse this data to inform emergency response.

Space-based information has a wide coverage and precision of observation, but the image processing takes some time. Sentinel Asia – an Asia-Pacific Regional Space Agency Forum voluntary initiative, is one of the mechanisms that connect space-based data providers with data analysis agencies, which have been assisting more than half of Emergency Observation Requests (EOR) coming from the ASEAN Member States (AMS). The use of satellite observation has been well-demonstrated in four AHA Centre's emergency responses in 2018, which helped the affected National Disaster Management Offices and the deployed ASEAN-ERAT in deciding areas for assessment and setting-up Material Storage Unit (MSU) to store relief items in a safe area. But there is still room for improvement. For instance, procedural guidelines for sharing space-based information in AMSs are available, but there is unfamiliarity in accessing and using the technology properly, and a lack of standard processes and procedures across agencies and creates challenges in coordinating among national and regional stakeholders.

Meanwhile, observation using UAV, will depend on different UAV rules applied in a particular country. The observation can be conducted instantly once the technology and the trained personnel are available. However, ASEAN does not have a procedural reference guiding the use of UAV. This technology also has limitations in its observation and coverage. In addition, as UAV does not rely on a third party, UAV are usually found in a

field command post and used to determine the assessment areas. Nonetheless, data analysis and processing capabilities for both using satellite observation and UAV from AMSs remain lacking.

Frontier analysis and technologies have proven to be extremely important, especially in managing emergencies during the pandemic COVID -19. Due to limited mobility, disaster managers need to be able to conduct analysis and mobilise resources remotely. One of the lessons the SCDF has learned in managing its flagship technologies is dynamic resource optimisation (DRO), video-enabled 911 (VEEN), rapid awareness and mobility implementation strategy, which focuses on data analytics and predictive modelling projects to mobilise resources during an emergency: Dynamic Resource Optimisation (DRO), Video Enabled Emergency Number (VEEN), Rapid Sensemaking and Mobility Implementation Strategy. However, the use of artificial intelligence and machine learning is still pending at the ASEAN level. Through learning from COVID-19 and given the current state of DELSA satellite warehouses in the region, the digitalisation of DELSA and logistics processes using AI and machine learning may enhance the efficiency of humanitarian logistics systems and optimise resource mobilisation processes. Future demand in AMS with higher exposure to disaster risks can be predicted through algorithms designed in the digitalised DELSA. This breakthrough showcases that technology does not only help disaster managers in conducting disaster impact assessments, but also mobilises aid efficiently. For this particular intervention, ASEAN must invest in the development and the sustainability of the digitalised DELSA, as well as capacity building for those who are manning it. The ICT Roadmap on Disaster Management for 2025 and Beyond provide key references for ASEAN institutions to further utilise frontier technologies.

### 3. Disaster Risk Finance and Insurance: Limited Access to and Innovation of Disaster Risk Finance and Insurance.

The ASEAN Disaster Risk Financing Insurance (DRFI) Roadmap was adopted by three ASEAN Sectoral Bodies: ACDM, ASEAN Finance and Central Bank Deputies Meeting (AFDM) and ASEAN Insurance Regulators Meeting in November 2011. At the time it was in synergy with the Prevention and Mitigation component of the AADMER Work Programme 2010-2012. It was further strengthened by the creation of the ASEAN Cross-Sectoral Coordination Committee (ACSCC) on DRFI on April 2013, the implementation of the ASEAN DRFI Programme Phase I (2015-2016) and the launch of ASEAN DRFI Phase 2 in 2019.<sup>29 30</sup> The AADMER Work Programme 2021-2025 aims for expansion in disaster risk financing with the planned outcome: The “Expanded reach of Disaster Risk Financing and Insurance (DRFI) Programme in the region under Priority Programme 2: Prevention and Mitigation”.

To design the appropriate DRFI scheme, it is crucial to quantify risks as the first step in the development of any strategies and mechanisms for DRR and climate financing. Both are targeted in the corresponding outputs to the outcome on disaster risk financing in the AWP 2021-2025. ASEAN needs to strengthen strategies to support DRFI as there is currently no comprehensive risk valuation across levels and limited probabilistic risk assessment that could change reliance from government-fund into a market-based risk financing. There are also technical challenges to formulate market-

ready parametric insurance provision that can be accepted by the wider ASEAN citizen (Chantarat and Raschky, 2020).

The common disaster risk financing challenges facing ASEAN Member States are the heavy reliance on government budget and the lack of pre-arranged financing mechanisms, such as insurance or contingent credit (World Bank, 2019). Finance-focused approach is yet to exclude relevant disaster risk management actors. Indicatively, there was explicit reluctance to broaden the stakeholder base by the Ministry of Finance which act as the leader and SEADRIF-related staff (e.g. World Bank) that has expertise in finance but not in disaster management (Chinh and Sterning, 2020). ASEAN Member States face funding challenges in obtaining sufficient and quality liquidity and coverage due to limited fiscal space and the limited capacity of local insurance markets for anticipating catastrophic risks. This lack of financing preparedness is further exacerbated by raising liquidity at the outset of an event because of limited borrowing capacity, under-developed local insurance and capital markets, and limited access to international (re)insurance and capital markets.<sup>31</sup>

From Southeast Asia Disaster Risk Insurance Facility (SEADRIF) feasibility study, it is stated that currently, one flood risk insurance product is under development for Cambodia, Lao PDR, Myanmar, and Viet Nam. However, the launch has been delayed.<sup>32</sup> The current situation in ASEAN suggests that multiple insurance products that could reduce disaster risk are neither available nor affordable to the people. A lesson learned from the Philippines Red Cross (PRC) stated that there have been bottlenecks between assessment, registration, and final listing that slowed down their response in

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29 ASEAN Secretariat (2019). “Launched: ASEAN Disaster Risk Financing and Insurance Phase 2”. August 2, 2020. <https://bit.ly/2Zsm8c2>

30 The World Bank & GFDRR (2012). Advancing Disaster Risk Insurance and Financing (DRFI) in ASEAN Member States: Framework and Options for Implementation. Available at [https://www.gfdr.org/sites/default/files/publication/DRFI\\_ASEAN\\_REPORT\\_June12.pdf](https://www.gfdr.org/sites/default/files/publication/DRFI_ASEAN_REPORT_June12.pdf)

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31 *Op. Cit. World Bank (2019)*

32 *Op. Cit. Chinh and Shernin (2020)*

cash disbursement. Given SEADRIF access, PRC is expected to scale up cash programming, scale-up early action, and reach more beneficiaries during recovery (RCRCCC, 2020). To enable those actions, where investment strategy is suggested, PRC targets capacity-building interventions for better project management.

Notwithstanding the challenges, the SEADRIF system offers promising opportunities as ASEAN governance allows for further proliferation of regional risk pooling mechanisms. One of the economic sectors that can implement this governance mechanism is the agricultural sector. Despite urbanisation, the majority of people in the ASEAN region and economies still depend on the agricultural sector, which is highly vulnerable to disasters and climate change. By working together, the cost of insurance cover and transaction costs can be significantly reduced, while creating a mass of business that could be attractive to the reinsurance market. In this way, SEADRIF can attract funders and boost the potential development of programmes, as well as share experience of DRM and climate change finance instruments within the AMS. There are also early examples of insurance market penetration in the agricultural sector to protect farmers against drought events in an ASEAN member state (Sirimanne, 2015). The nascent microinsurance, which is also applicable to efforts to provide adaptive social protection, still has a long way to go to ensure that ASEAN leaves no one behind.

One potential room for improvement to foster cross-sectoral collaboration is to address the absence of operational linkage and interface between SEADRIF's Flood Risk Model and Tool with the Disaster Monitoring and Response System (DMRS). The same applies to other national-level risk information web-based platforms and regional digital assets under the COSTI (AHA Centre, 2019; AHA Centre, 2021). Despite its focus only on the

parametric insurance pool for floods, SEADRIF's values also have not complemented the existing preparedness and response capabilities of ASEAN through AJDRP modules and DELSA. Or in other words, can ASEAN proclaim the following: when and if SEADRIF's public asset financial protection program and parametric insurance pool are working against floods, then the tools and mechanisms of the ACDM will concentrate on utilisation against other types of natural hazards? Arguably, not yet as is shown in the case of the 2018 Lao PDR TS Son-Tinh, Dam Break, and Floods.

### **Potential Actions and Cooperation across Pillars and Levels to Build Systemic Resilience through the Whole-of-ASEAN approach**

*“The keys to building resilience and accelerating sustainable development are measuring what we value, designing systems around the way people make decisions on risk, and reconfiguring governance and financial systems to work collaboratively and across silos”.*<sup>33</sup> Almost all ASEAN Sectoral Bodies, Centres, and Entities have significant roles to play based on the convergence and common interests, functional capacities through utilisation of their assets, know-how, and infrastructure, and the potential and actual means for cooperation in resilience-building. Hence, the creation of the ADRP should be followed by a comprehensive plan that is based on the updated worldview on the regional and global risks as well as the recommendations from the Mapping Exercise: Rebranding and expansion, Resource mobilization, Future-proofing through digital transformation, Broadening collaboration during disaster response, Communication strategy, ASEAN as Global leader, A new and rejuvenated joint HADR platform for ASEAN.<sup>34</sup>

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<sup>33</sup> Op. Cit. UNDRR (2022).

<sup>34</sup> Op. Cit. ASEAN (2021a).

While some of the recommendations from the Mapping Exercise require a multi-layer institutional adjustment, this Policy Brief recommends three actions and cooperation across pillars and levels to build systemic resilience through the Whole-ASEAN approach. These are the first steps attainable until 2023.

### **1. Institution: ASEAN Regional Disaster Resilience Forum**

The first ASEAN Regional Disaster Resilience Forum will be the first external appearance of the ADRP to the wider public and partners of ASEAN. The agenda-setting and design of the forum should reflect the convergence and common interests in disaster management.<sup>35</sup> The inclusivity and partnership spirit of the ASEAN Regional Disaster Resilience Forum could start by ensuring that beyond the identified strategic actors for disaster management of ASEAN, broader actors could openly access and share their thoughts and innovation in the forum. This also includes youth and young professionals' representatives, local leaders, indigenous people, and equally important, the disaster-affected people or significantly at-risk in the region. All Sectoral Bodies, Centres, Entities associated, and the wider spectrum of partners and stakeholders of ASEAN in disaster management should be given equal opportunity to share their knowledge, and co-creation planning and sessions could be envisaged to strengthen institutions.

Leveraging the preparatory momentum to and immediately after the first ASEAN Regional Disaster Resilience Forum, the following initiatives could be considered by the ADRP:

- a. Developing a common work plan that is aligned with the respective sectoral plans to

enhance coordination among Sectoral Bodies, Centres and Entities associated with ASEAN. The first ASEAN Regional Disaster Resilience Forum could be the springboard for developing or launching a “Banner Program” for sectoral bodies that are aligned with the three pillars of ASEAN

- b. Developing a communication strategy that supports sharing of updates and key activities of Sectoral Bodies, Centres and Entities associated with ASEAN to enhance participation, promote multi-linguistic communication, etc.
- c. Identifying civil societies with cross-linkage with ASEAN works and regular engagement of civil societies for synchronization of the activities.
- d. Establishing a communication center hub in disaster management and more engagement in collaboration for affected countries.
- e. Fostering youth's contribution and leadership in areas of prevention, response, and post-recovery through capacity building, volunteerism and social entrepreneurship.
- f. Establishing a network of media professionals which will contribute to the timeline and accuracy of information shared among the ASEAN Member States and external partners.
- g. Incorporating a health component in ASEAN disaster response and strengthening SG-AHAC.
- h. Contributing to the efforts on enhancing disaster prevention, disaster mitigation, disaster preparedness, disaster emergency responses, and post-disaster recovery through collaboration on a warning system, information management and dissemination at the time of crisis.

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<sup>35</sup> Op. Cit. ASEAN (2021a).

## 2. Frontier Analyses and Technologies: Inclusive, Systemic, and Measurable Probabilistic Risk Diagnostic and Modeling Using New Technologies

The prerequisite for systemic resilience through the Whole-ASEAN approach requires a move to a multi-hazard, impact-based risk assessment approach, which moves beyond the traditional hazard-by-hazard approach and should be able to provide an initial estimation of the cost of (potential) loss and damages due to disasters, climate change, and other hazards across various sectors. Hence, the whole of ASEAN can and should invest in data analytics and frontier technologies that can help with much better risk understanding, including in a probabilistic manner and resilience-building and planning fulfilling that are able to navigate uncertainty. However, it should use quality models and big data, combined with methods to draw on local knowledge, community feedback, and expert opinion. Methods combine digital stakeholder engagement platforms, spatial data, and a range of outreach tools to engage the public in the planning processes of ASEAN's efforts in resilience building. These include the three pillars, sectoral bodies, associated ASEAN entities, non-government organisations, academia, youth, local governments, and indigenous people.

There are some promising initiatives that have been outlined by the ASEAN Mapping Exercise<sup>36</sup> and ASEAN Disaster Resilience Outlook<sup>37</sup> or the Project Evaluation of ICT Phase IV<sup>38</sup>, which could contribute to the development of an inclusive, systemic, and measurable risk probabilistic risk diagnostic and modelling of the whole-of-ASEAN using new technologies.

- a. Fully utilising the guidance of the ICT Roadmap on Disaster Management for 2025 and beyond.
- b. Produce dedicated ICT infographics or other Information, Education, and Communication (IEC, e.g., short video or poster) material that could be prepared to introduce each ICT product and service of the AHA Centre, its overall linkages, and values.
- c. Standardize format and access to the user manuals of all ICT product and services. Potentially, this could be housed in the AHA Centre's Learning Management System.
- d. Tailor-made ICT support to meet variety of digital maturity levels of the ASEAN Member States and to produce the critical-mass of community-of-practice of digitally savvy disaster managers in ASEAN.
- e. Enhancing capacity building in space technology and geoinformatics for disaster management through workshops, seminars, overseas internships, and others, especially by leveraging existing ASEAN mechanisms, such as ARTSA, or mechanisms whereby all ASEAN Member States are parties, such as Sentinel Asia.
- f. Promoting regional data sharing to ensure the resilience of telecommunication in all the phases of disaster management.
- g. Improving multi-hazard-based predictive modeling at the local level and knowledge sharing on disaster risk reduction and climate change adaptation.
- h. Contributing to the efforts on enhancing disaster prevention, disaster mitigation, disaster preparedness, disaster emergency responses, and post-disaster recovery through collaboration on a warning system, information management, and dissemination at the time of crisis.

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36 Op. Cit. ASEAN (2021a).

37 ASEAN (2021b). ASEAN Disaster Resilience Outlook. Jakarta: Association of Southeast Asian Nations.

38 Op. Cit. AHA Centre (2021).

### **3. Disaster Risk Finance and Insurance: ASEAN's Disaster Management Tools and Mechanisms, Southeast Asia Disaster Risk Insurance Facility, and beyond**

The previous section has shown that the resources and capabilities of the different sectors and pillars to improve disaster management are not interlinked. For example, between DMRS and SEADRIF's flood risk management tool, or between the lack of complementary effects of SEADRIF's parametric insurance for floods to reduce the burden on AJDRP modules and DELSA in responding to multiple hazards, including floods. Both have also underutilised COSTI's rich digital resources. In terms of anticipatory action, there is a need for conversations, interfaces and integration at the information and data level. An example of this is cross-sector and cross-pillar data integration for building resilience and anticipatory preparedness and response to support operational and tactical decisions. In this case, more cross-sectoral and cross-pillar initiatives can be promoted between SEADRIF's capabilities and ASEAN disaster management tools and mechanisms, and vice versa.

Several layers of connection are required for nurturing and installing an anticipatory mindset in both finance and disaster management sectors, each with a variety of potential initiatives to be undertaken by ACDM, AFDM, and beyond.

#### **a. Strategic connectivity**

- High-level declaration and strategic adjustment on the financial channels that could be used for anticipatory actions in disaster management. For example, these include ADMER Fund, ASEAN Development Fund, and SEADRIF.

#### **b. Operational connectivity: ASEAN Disaster Risk Monitoring and Response System DMRS vis-a-vis Financial Risk Management (FRM) Tool and other relevant systems.**

- Fostering operational connection, inter-linkages, transfer of data/information between DMRS, SEADRIF's Flood Risk management Tool, and other matured digital assets of ASEAN in disaster management
- Building smallholder farmers' knowledge and skills in developing and/or selecting seed varieties that suit their own preferred traits and local conditions; promotion of diversified farming systems aimed at minimizing the impacts of disasters and improving the resilience of farming communities.
- Developing an ecosystem that would encourage intensive research and development, facilitate technology transfer and increase the commercial viability of nascent innovative and research breakthroughs in disaster management.

#### **c. Tactical connectivity: sharing data, exchanging data.**

- Developing data transfer protocol and API readiness for all digital tools and systems of ASEAN with relevance to disaster management, including those within the purview of ACDM, AFDM, and others.
- Technical exchange between tactical-level and ICT officers of Sectoral Bodies, Centres, and Entities relevant, especially that of ACDM and AFDM.

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