

1. Asian Disaster Reduction Center

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The Asian Disaster Reduction Center (ADRC), established in 1998, is a regional initiative aimed at enhancing disaster resilience, building safer communities, and creating a society where sustainable development is attainable among its 33-member countries (Annex 1: History of Establishment of ADRC).

1.1 Key Activities

At the end of every fiscal year, ADRC prepares an Annual Report highlighting its achievements along the three pillars of activities:

- **Information sharing.** This pillar includes the ADRC website, GLocal unique disaster IDentifier (GLIDE) number system, Sentinel Asia, and Asian Conference on Disaster Reduction (ACDR).
- **Human resource development.** This pillar includes the Visiting Researcher (VR) Program, seminars, workshops, and training activities on disaster risk reduction (DRR).
- **Cooperation among member countries and partner organizations.** This pillar includes development and promotion of innovative tools as well as forging partnerships and networks to advance resilience to disasters (e.g., research and international engagements).

After 21 years functioning as part of the Urban Disaster Research Institute (UDRI), ADRC became independent and obtained corporate status in April 2020 following the launch of the ADRC Foundation. Under this reconfigured status, ADRC gained greater flexibility in performing its international operations as well as bolstering its domestic activities.

1.2 Composition

ADRC is composed of member and advisor countries (Figure 1.1) as well as partner organizations. Member countries share information, experiences, and expertise on DRR that ADRC disseminates regionally by means of dispatching of experts and other methods. Advisor countries offer financial contributions as well as share expertise and experiences to member countries and the Secretariat, including dispatch of their DRR experts when needed.



Figure 1.1 ADRC member countries as shown on the map

1.2.1 Member and Advisor Countries

During its establishment in 1998, ADRC comprised 22-member countries, 4-advisor countries, and 1-observer organization. Its membership continues to expand with Armenia joining in August 2000, the Kyrgyz Republic in July 2002, Pakistan in July 2005, Yemen and Bhutan in December 2007, Azerbaijan in 2009, the Maldives in 2010, Iran in 2012, Türkiye in 2018, Fiji in 2023, and Brunei Darussalam in 2024, bringing the number of member countries to 33. The number of advisor countries also expanded to 5 with USA joining in March 2004 (Table 1.1).

Table 1.1 Timeline of the Expansion of Member and Advisor Countries

1998 (At the time of foundation)	India, Indonesia, Uzbekistan, Kazakhstan, Cambodia, Singapore, Sri Lanka, Thailand, Republic of Korea, Tajikistan, China, Japan, Nepal, Papua New Guinea, Bangladesh, Philippines, Viet Nam, Malaysia, Myanmar, Mongolia, Lao PDR and Russia (Member countries: 22) Australia, Switzerland, New Zealand and France (Advisor countries: 4) Asian Disaster Preparedness Center (Observer)
2000	Armenia
2002	Kyrgyz Republic
2004	USA (Advisor country)
2005	Pakistan
2007	Bhutan, Yemen
2009	Azerbaijan
2010	Maldives
2012	Iran
2018	Türkiye
2023	Fiji
2024	Brunei Darussalam

ADRC's counterparts are the disaster risk management (DRM) agencies (Table 1.2).

Table 1.2 Counterpart Agencies

Country	Counterpart
Armenia	Regional Survey for Seismic Protection (RSSP), Ministry of Internal Affairs
Azerbaijan	Ministry of Emergency Situations
Bangladesh	Ministry of Disaster Management and Relief
Bhutan	Ministry of Home Affairs
Brunei Darussalam	National Disaster Management Centre (NDMC), Ministry of Home Affairs
Cambodia	The National Committee for Disaster Management (NCDM)
China	National Disaster Reduction Center of China
Fiji	National Disaster Risk Management Office (NDRMO)
India	Ministry of Home Affairs

Country	Counterpart
Indonesia	National Disaster Management Agency (BNPB)
Iran	National Disaster Management Organization (NDMO)
Japan	Cabinet Office
Kazakhstan	Ministry of Emergency Situations
Republic of Korea	Ministry of the Interior and Safety
Kyrgyz Republic	Ministry of Emergency Situations
Lao PDR	National Disaster Management Office (NDMO), Ministry of Labour and Social Welfare
Malaysia	National Disaster Management Agency (NADMA)
Maldives	National Disaster Management Authority
Mongolia	National Emergency Management Agency (NEMA)
Myanmar	Ministry of Social Welfare, Relief and Resettlement
Nepal	Ministry of Home Affairs
Pakistan	National Disaster Management Authority (NDMA)
Papua New Guinea	Department of Provincial & Local Government Affairs
Philippines	National Disaster Risk Reduction and Management Council (NDRRMC)
Russia	Ministry of the Russian Federation for Affairs for Civil Defence, Emergencies and Elimination of Consequences of Natural (EMERCOM)
Singapore	Singapore Civil Defence Force (SCDF)
Sri Lanka	Disaster Management Centre, Ministry of Defence
Tajikistan	Committee of Emergency Situations and Civil Defense (CoES)
Thailand	Department of Disaster Prevention and Mitigation (DDPM), Ministry of Interior
Türkiye	Ministry of Interior - Disaster and Emergency Management Presidency (AFAD)
Uzbekistan	Ministry of Emergency Situations
Viet Nam	Viet Nam Disaster and Dyke Management Authority (VDDMA), Ministry of Agriculture and Rural Development (MARD)
Yemen	Ministry of Water and Environment

As for the advisor countries, ADRC's counterparts are the following: National Emergency Management Agency (NEMA) in Australia, Swiss Agency for Development and Cooperation (SDC) in Switzerland, Ministère de la Transition écologique et de la Cohésion des territoires in France, National Emergency Management Agency (NEMA) in New Zealand, and United States Agency for International Development (USAID) in the USA.

1.2.2 Partner Organizations

In promoting disaster risk reduction in Asia, ADRC cooperates with UN agencies and international organizations/initiatives, such as the United Nations Office for Disaster Risk Reduction (UNDRR), the United Nations Office for

the Coordination of Humanitarian Affairs (UNOCHA), the United Nations Development Programme (UNDP), and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). ADRC also cooperates with regional organizations (e.g., ASEAN Secretariat and Center for Emergency Situations and Disaster Risk Reduction - CESDRR), initiatives (e.g., WMO/ESCAP Typhoon Committee, APEC-EPWG, and Sentinel Asia), and institutes (e.g., International Research Institute of Disaster Hazards - IRIDeS and Tsunami and Disaster Mitigation Research Center - TDMRC).

2. Highlights of FY2024.

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Among the highlights of Fiscal Year 2024 include the organization of the Asian Conference on Disaster Reduction (ACDR2024) in Hanoi, Viet Nam, the analysis of the 2025 Myanmar Earthquake, the drafting of the ASEAN Agreement on Disaster Management and Emergency Response (AADMER) Work Programme 2026–2030, and the 20th commemoration of the Indian Ocean Tsunami.

2.1 Activities in Figures

At a glance, Figure 2.1 shows the ADRC milestones of FY2024 along its three activity areas: 1) information sharing; 2) human resource development; and 3) international cooperation.

ADRC MILESTONES OF FISCAL YEAR 2024

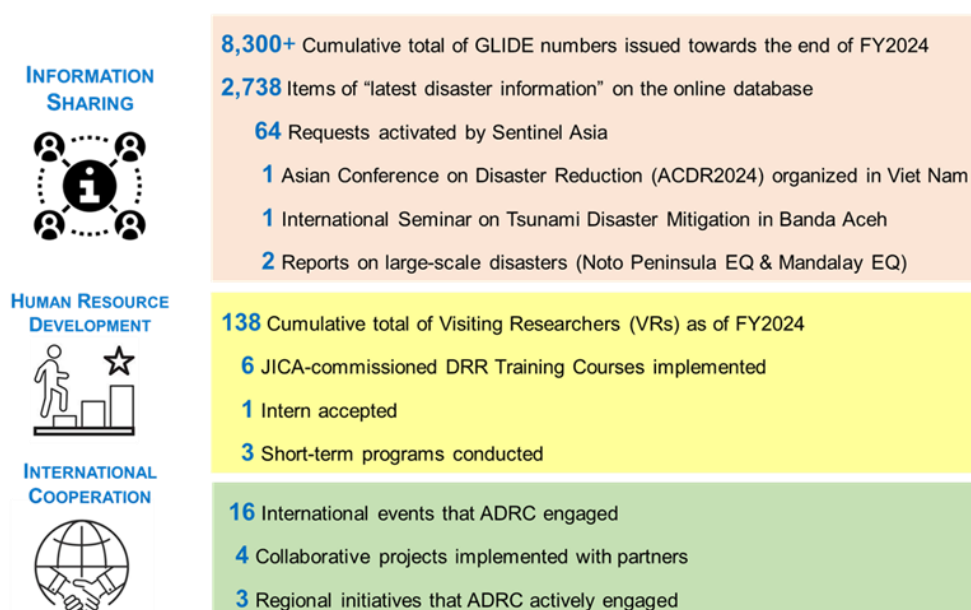


Figure 2.1 Highlights of ADRC Activities in FY2024

2.2 Asian Conference on Disaster Reduction 2024

Hosted by the Viet Nam Disaster and Dyke Management Authority (VDDMA), Ministry of Agriculture and Rural Development (MARD), and in cooperation with the Cabinet Office Government of Japan and the Asian Disaster Reduction Center (ADRC), the Asian Conference on Disaster Reduction (ACDR2024) was organized in Hanoi, Viet Nam on 12–13 November 2024. Adopting the theme, "Proactive Solutions and Anticipatory Actions for Sustainable Resilience to the Climate Crisis", ACDR2024 featured four sessions:

- 1) Roundtable on resilience to climate crisis
- 2) Thematic session on enhancing flood risk information
- 3) Thematic session on improving flood countermeasures
- 4) Special session on disasters and disaster management in Viet Nam

ACDR2024 gathered 80 onsite participants from member countries, representatives of international and regional organizations, private sectors, the academic and research institutes. Also, 62 participants including those from five member countries attended online.



Figure 2.2 ACDR2024 Group Photo

2.2.1 Opening Session

High-level officials from the Government of Viet Nam and from the Government of Japan, and the outgoing chairman of the ADRC delivered the opening speeches.



“Through the Asian Conference on Disaster Reduction (ACDR), member countries could gain greater understanding of risk, learn new approaches to community resilience, and embrace latest technologies for DRR.”

Mr Nguyen Hoang Hiep
Vice Minister, Agriculture and Rural Development
Government of Viet Nam



“As major disasters have become more frequent, it is increasingly important to take steps for mitigation ensuring national resilience, providing residents with disaster risk information, improving living conditions in evacuations in the event of a disaster, and implementing Build Back Better initiatives.”

Mr NUKINA Koji
Assistant Vice Minister for Disaster Management
Government of Japan



“All the sessions in the ACDR2024 will bring valuable insights and information on strengthening resilience to member countries.”

Prof. HAMADA Masanori
Chairman
Asian Disaster Reduction Center

2.2.2 Roundtable Session

Fifteen member countries, namely: Brunei Darussalam, Cambodia, Japan, Republic of Korea, Lao PDR, Malaysia, Mongolia, Myanmar, Pakistan, Papua New Guinea, Philippines, Singapore, Sri Lanka, Thailand, and Viet Nam delivered an official statement at the roundtable on “Challenges and Progress in Implementing the Actions Related to Resilience to Climate Crisis in the Sendai Framework for Disaster Risk Reduction”, which was moderated by Ms Doan Thi Tuyet Nga (Director of International Cooperation and Science Technology Department, VDDMA). Overall, the statements highlighted common strategies on strengthening resilience to climate crisis.



Figure 2.3 Government officials and representative who delivered statements at the Roundtable Session

Enhance the support mechanisms for climate actions. This includes: 1) ensuring that plans, e.g., DRR Plans, Development Plans, and National Action Plan are aligned with the Sendai Framework for Disaster Risk Reduction; 2) embracing digital transformation in DRR and Climate Change Adaptation (CCA), such as maintaining a climate-related disaster database systems; 3) widening the platforms for knowledge exchange and information-sharing; 4) promoting risk-informed development based on reliable assessments; and 5) Adopting All-of-Society approach in all aspects of DRR-CCA efforts to ensure that “no one is left behind”.

Bolster financing options for mitigation of climate crises. This includes: 1) impact-based forecasting and anticipatory actions; 2) parametric insurance for public assets; 3) catastrophic risk insurance pool for local governments and small businesses; 4) multi-national risk pooling facilities, e.g., Disaster Risk Insurance Facility; and 5) public-private partnerships.

Embrace science and technology to strengthen climate resilience. This includes: 1) adopting science-based and risk-informed approaches to development; 2) exploring the utilization of AI-driven disaster risk management systems; 3) availing satellite services and space-based technologies for observing, monitoring, and disseminating information on disaster risk; and 4) integrating scientific and indigenous/traditional knowledge and practices on DRR, ensuring that communities can adapt to new technologies.

2.2.3 Session 1: Enhancing Flood and Flash Flood Risk Information

Moderated by Prof. MIURA Fusanori (Yamaguchi University, Japan), this session showcased the latest technologies that could help enhance flood and flash flood risk information.



Prof. Demetrios Eliades
KIOS Center of Excellence
University of Cyprus



Prof. SHUMUTA Koji
Center for Asian Studies
Kanagawa University, Japan



Prof. MIURA Fusanori
Space Data Utilization Promotion
Yamaguchi University, Japan



Dr. Masita Dwi Mandini Manessa
University of Indonesia



Mr. Nguyen Xuan Sang
Deputy Director, ARDD
Yen Bai Province, Viet Nam



Mr. Hoang Minh Tuan
Head, DMA-ARDD
Cao Bang Province, Viet Nam

Figure 2.4 Speakers of Thematic Session 1

Associate Prof. Demetrios Eliades (KIOS Center of Excellence, University of Cyprus) presented examples of AI-enabled systems for monitoring and forecasting risk that are useful for flood modeling and flood/water quality risk assessment. Additionally, he presented how Low-Power Wide Area Network (LPWAN) communication technology can be useful in disseminating flood risk information, particularly in areas that have limited access to cellular networks or Wi-Fi. Prof. SHUMUTA Koji (Center for Asian Studies, Kanagawa University, Japan) introduced sensing technologies for disaster response and recovery. For instance, in risk assessment management system for power lifeline (RAMP), various sensors are being utilized to improve the performance of temporal and spatial interpolation. Prof. MIURA Fusanori (Yamaguchi University, Japan) outlined the current situation of utilizing satellite data for disaster management. He said that there are various forms of cooperation in using satellite data. In the region, there is Sentinel Asia, and in Japan, there is a Consortium for Satellite Earth Observation (CONSEO). However, in delivering the service, publicly-owned and privately-owned satellites work independently. As shown in the result of disaster prevention drill, independently-provided satellite service is less effective. To make it more effective, a Satellite One-stop System is introduced to optimize the role of satellite in disaster management. Dr. Masita Dwi Mandini Manessa (Lecturer, Geography Department, University of Indonesia) highlighted the role of spatial machine learning in predicting landslides and floods in agricultural systems of Magelang Regency in Indonesia. By using spatial machine learning, it is predicted that approximately 38% of high-productive agricultural lands will be exposed to high flood risk. Mr. Nguyen Xuan Sang (Deputy Director of Agriculture and Rural Development Department, Yen Bai Province, Viet Nam) reported the impacts of landslides in Yen Bai Province caused by Typhoon Yagi. Lessons from that experience include the need for

improving the technologies for forecasting and early warning systems for landslides. Mr Hoang Minh Tuan (Head of Disaster Management Administration, Irrigation Sub-Department, Agriculture and Rural Development Department, Cao Bang Province, Viet Nam) shared the lessons from responding to Typhoon Yagi in Cao Bang Province. Among these are the need for better technologies for search and rescue operations, including the use of drones.

2.2.4 Session 2: Improving Flood Countermeasures Based on Analyses of Future Risk for Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA)

Dr Nguyen Nghia Hung (Deputy Director of Southern Institute for Water Resources Research, Viet Nam) moderated this session that focuses on “Improving Flood Countermeasures Based on Analyses of Future Risk for Disaster Risk Reduction and Climate Change Adaptation”. Speakers on this session shared principles and approaches in improving flood countermeasures for DRR-CCA.



Dr Nguyen Nghia Hung
Deputy Director, Southern Institute
for Water Resources, Viet Nam



Mr SUZUKI Takashi
Advisor for DRM
JICA Expert at VDDMA



Dr ONO Takahiro
General Manager
Tokio Marine Holdings



Mr Junha Kim
Head of Team, MOIS
Republic of Korea



Ms Angsumalin Angsusingha
Disaster Management Center
DDPM, Thailand



Mr Le Anh Dung
Director, Irrigation Sub-Dept
Ha Giang Province, Viet Nam

Figure 2.5 Speakers of Thematic Session 2

Mr SUZUKI Takashi (Advisor for Disaster Risk Management [JICA Expert] at VDDMA) emphasized the concept of “kaizen”, a Japanese term for continuous learning and improvement (e.g., failure, science, and world). Applying the concept of “kaizen” helps improve flood countermeasures, such as through scientific river improvement and integrated river basin management. Dr ONO Takahiro (Special Appointed Professor, Tohoku University/General Manager, Tokio Marine Holdings) highlighted the benefits of “ex-ante investment” or pre-investment in disaster risk reduction. Initiatives such as the Business Continuity Plan (BCP) and the Disaster Mitigation Action Plan (Timeline) are examples of ex-ante investment that reduces post-event economic contractions and speed-up post-disaster recovery. Mr Junha Kim (Head of Team, Ministry of the Interior and Safety, Republic of Korea) reported that the implementation of flood countermeasures in the Republic of Korea include: 1) proactive disaster preparedness by ensuring the readiness of the institution in implementing pre-emptive evacuation to reduce casualties; and 2) collaborative disaster management by engaging all stakeholders in disaster governance. Ms Angsumalin Angsusingha (Disaster Management Expert, Disaster

Management Center, DDPM, Thailand) shared a case study of flooding situation in Northern Thailand, and how the DDPM had addressed the challenges. She presented the Solution Framework, a community-centered approach, that DDPM applied in addressing flooding situations. Basically, the Solution Framework embraces the community-based disaster risk management (CBDRM) approach. Mr Le Anh Dung (Director of Irrigation Sub-Department, Agriculture and Rural Development Department, Ha Giang Province, Viet Nam) shared the damage caused by Typhoon Yagi in Ha Giang Province. He reported that the impacts were severe, yet the external support for emergency response was limited. To address this challenge, Ha Giang Province will continue to train community-based first-responders to optimize local capacities.

2.2.5 Special Session on Disasters and Disaster Management in Viet Nam

This special session was moderated by Mr SUZUKI Takashi (Advisor for Disaster Risk Management [JICA Expert] at VDDMA) to provide an overview of the disasters and disaster management in Viet Nam. Highlighting floods, flash floods, and landslides in the context of Typhoon Yagi that impacted several provinces in Viet Nam in September 2024, this session showed examples of disaster management in the areas of preparedness, prevention and mitigation, response, and recovery. It also showed the diversity of disasters in Viet Nam as well as the future direction of ASEAN cooperation, as outlined by the Government of Viet Nam.



Mr Nguyen Xuan Tung
Deputy Director, DRR
VDDMA



Mr Quan Van Viet
Deputy Chief, OSCDPS
Lao Cai Province



Mr Luong Khac Kien
Division Head, Irrigation Sub-Dept
Son La Province



Mr Pham Quoc Hung
Director, Irrigation Sub-Dept
Yen Bai Province



Mr Doan Manh Phuong
Director, Irrigation Sub-Dept
Quang Ninh Province



Dr Nguyen Nghia Hung
Deputy Director, Southern Institute
for Water Resource Research



Mr SUZUKI Takashi
Advisor for DRM
JICA Expert at VDDMA



Mr Ngo Huu Huy
Centre of Policy and Technology
Disaster Management, VDDMA



Ms Dam Thi Hoa
Deputy Director, ICSD
VDDMA

Figure 2.6 Speakers of the special session on disasters and disaster management in Viet Nam

Mr Nguyen Xuan Tung (Deputy Director, Department of Response and Recovery, VDDMA) reported the situation of flash floods and landslides in the northern mountainous region of Viet Nam in the past 10 years (2014–2024). On average, flash floods and landslides cause 62 deaths per year in the past decade, and mostly in the mountainous areas. To reduce future impacts, his recommendations include: strengthen communication systems, raise community awareness, build local capacity for response, detailed regional accurate forecasting, early warning system, and household-level disaster management planning.

Mr Quan Van Viet (Deputy Chief of Office of the Steering Committee for Disaster Prevention and Search and Rescue, Lao Cai Province) reported the impacts of Typhoon Yagi in Lao Cai Province, causing serious damage to people, property, infrastructure, and disrupting the social activities. To effectively address the impacts of

similar disaster in the future, he mentioned the following: making the infrastructure more resilient, improving the forecasting and early warning systems, and strengthening data collection and risk analysis.

Mr Luong Khac Kien (Division Head, Irrigation Sub-Department, Agriculture and Rural Development Department, Son La Province) introduced the pilot model for flash flood prevention in Son La Province under the technical cooperation between the Government of Japan and Viet Nam. The components of the pilot model, include: 1) early warning system, 2) resettlement and landuse, and 3) construction of Sabo Dam to prevent erosion and flash floods. Sabo Dam is being constructed in one of the planned 12 locations of Nam Pam River, Muong La District, Son La Province, and he hopes that necessary resources will be mobilized to complete the construction in other locations.

Mr Pham Quoc Hung (Director of Irrigation Sub-Department, Agriculture and Rural Development Department, Yen Bai Province) introduced the capacity building on landslide early warning that is being piloted in Tram Tau District, Yen Bai Province under the technical cooperation between the Government of Japan and Viet Nam. About 130 households living in the pilot area are oriented on the newly installed early warning systems. The system monitors movement of land mass and provides warning to the community. The data is also transmitted in real time to the office in Yen Bai Irrigation Sub-Department. This system is expected to contribute in increasing community resilience to landslide. Additionally, he mentioned the importance of risk assessment of wide area in Yen Bai Province.

Mr Doan Manh Phuong (Director of Irrigation Sub-Department, Agriculture and Rural Development Department, Quang Ninh Province) reported that Typhoon Yagi had severely impacted the agricultural production affecting the livelihoods of people in Quang Ninh Province. Among the actions to address the challenges, include support for: 1) school tuition of children and students, 2) needs of agricultural sector, 3) repair of damaged houses, 4) demolition of submerged fishing boats, and 5) developing sustainable aquaculture.

Dr Nguyen Nghia Hung (Deputy Director, Southern Institute for Water Resource Research) presented the challenges in addressing river bank and coastal erosion in the Mekong Delta. Among the causes and risks of river bank erosion are: 1) housing is too close river flow, 2) sand mining, 3) instability of river bank formed by sand and mixed clay, 4) surcharging or loading on river bank, and 5) fish ponds near the main river. Currently several scientific approaches are being conducted but comprehensive measures including environmentally friendly solutions should be discussed and taken to address such erosion, since they are critical issue in the Mekong Delta Region.

Mr Ngo Huu Huy (Centre of Policy and Technology disaster management, VDDMA) presented the Viet Nam Disaster Monitoring System (VNDMS), a system that supports disaster prevention and control (DPC) management through data integration and connectivity with various ministries, line agencies, organizations, and local authorities. It enables the analysis and visual display of information and data to provide disaster warnings for agencies, organizations, and the community. The system is developed, managed, and monitored 24/7 by the Centre of Policy and Technology of VDDMA to ensure stable and secure operations as well as timely response.

Ms Dam Thi Hoa (Deputy Director of International Cooperation and Science Technology Department, VDDMA) provided an overview of the Ha Long Ministerial Statement on the Strengthening of ASEAN Anticipatory Actions in Disaster Management to show Viet Nam's role in international cooperation for disaster risk reduction. The statement emphasized three building blocks for action: 1) Improve risk information, forecasting and early warning systems; 2) Enhance planning, operations, and delivery in delivering anticipatory actions in disaster

preparedness and response; and 3) Promote pre-arranged finance for a successful anticipatory action in disaster management.

2.2.6 Closing Session

Executive Director of ADRC, Director-General of VDDMA, Assistant Vice Minister for Disaster Management in Japan, and the new chairman of ADRC delivered the closing speeches.



“ACDR2024 offered insights to strengthen resilience to climate crisis, such as enhancing the support mechanisms for climate actions, bolstering the financing options for climate change mitigation, and embracing climate science.”

Mr SASAHARA Akio
Executive Director
Asian disaster Reduction Center



“Due to close cooperation with ADRC, officials at VDDMA/MARD have greater opportunity to get involved in the international environment, including participation in capacity building programs and short-term training.”

Mr Pham Duc Luna
Director-General VDDMA, MARD
Government of Viet Nam



“ADRC is expected to take ever larger roles of promoting the Sendai Framework and hub of wisdoms in investment for disaster risk reduction.”

Mr NUKINA Koji
Assistant Vice Minister for Disaster Management
Government of Japan



“Various DRR measures are needed, not only for post-disaster response and recovery, but also, for disaster prevention and mitigation through investment and utilization of advance and effective ICT-based initiatives in anticipation of future disasters.”

Prof. MIURA Fusanori
Chairman
Asian Disaster Reduction Center

2.3 Report on the 2025 Myanmar Earthquake

Following the strong earthquake of Mw 7.7 at a depth of 10 km occurred on 28 March at 06:20 UTC (12:50 local time) in Sagaing Region, Central Myanmar, ADRC immediately started compiling disaster information (see [report](#)). ADRC coordinated the issuance of GLIDE number and facilitated the request for earth observation satellite images.

2.3.1 Issuance of GLIDE Number

When the GLIDE number for the event [EQ-2025-000043-MMR](#) was issued through ADRC, relevant institutions (e.g., [ReliefWeb](#), [GDACS](#), and [Sentinel Asia](#)) used it as the “disaster ID of the event” to facilitate integration of information. Initial data indicated that an aftershock of Mw 5.5 at a depth of 7.7 km occurred on 13 April at 02:24 UTC (08:54 local time) in the Mandalay region of central Myanmar. The epicenter was located about 34 km north-northeast of Meiktila City and 78 km south of Mandalay City. The United States Geological Survey (USGS) PAGER estimated that up to 86,000 people were exposed to severe shaking while 631,000 were exposed to strong and very strong shaking. As of 12 April, information from the AHA Centre indicate that the death toll continued to rise—recording 3,648 fatalities, 134 missing people, and 4,817 injured people. Approximately 200,000 were displaced, of whom 42,118 were in 134 temporary shelters.

2.3.2 Initial Assessments

On 7 May 2025, ADRC shared the initial assessment of [damage situation](#) (Figure 2.7)

Damage Situation (as of 18:00 on 07 MAY 2025)

Damage in Myanmar, Thailand, China etc.

	Myanmar	Thailand	China etc.
Killed	3,787	95	
Missing	88		
Injured	5,106	37	
Affected People	499,123		
Evacuee	309,639		
Damaged Buildings	Houses	81,635 (11,918 totally damaged)	1,389
	Buildings	5,488	39 *A high-rise building under construction collapsed
	Government offices	6,856	83
	Schools	2,642	129
	Hospitals	594	168
	Religious buildings	10,608	
	Pagodas/ Temples	6,033	91
Damaged Infra-structure	Railways	38	
	Roads	403	
	Expressway	198	
Fire	occurred		
Lifeline	Widespread interruption of electricity and communication lines		
Source	AHA Centre https://ahacentre.org/situation-update/ MOFA https://www.mofa.go.jp/mofaj/area/asia.html , ReliefWeb https://reliefweb.int/ DDP https://www.disaster.go.th/contents/disaster_news CEA https://www.cea.gov.cn/cea/xwzx/fzzyw/5807447/index.html		

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Figure 2.7 Damage assessment collected by ADRC as of 7 May 2025

It is expected that the number of deaths and injuries will rise when official data is available. This earthquake caused widespread destruction of infrastructure, including residential, governmental, and religious structures. Transboundary impacts were observed in Bangkok, Thailand, where a 33-story skyscraper collapsed, claiming

29 lives. This earthquake exposed the vulnerabilities in urban planning and disaster preparedness that are exacerbated by rapid urbanization and inadequate seismic codes.

2.3.3 Satellite Imageries

As co-chair of [Sentinel Asia](#), ADRC facilitated the request for earth observation satellite (EOS) imagery of the earthquake-impacted areas of Myanmar. One of the products is shown on Figure 2.8.

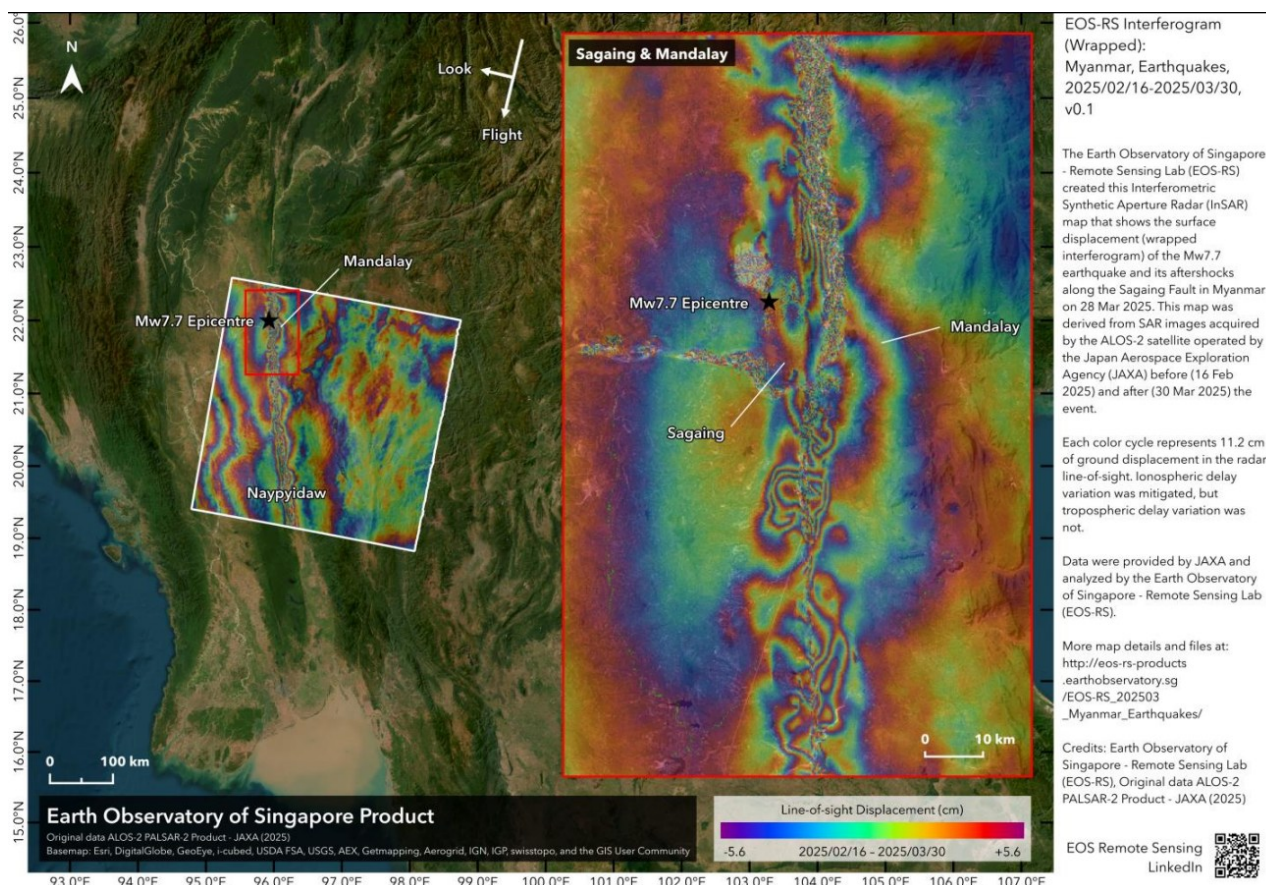


Figure 2.8 InSAR (Interferometric SAR) analysis of ALOS-2 satellite imagery

Earth Observatory of Singapore - Remote Sensing Lab (EOS-RS) created an Interferometric Synthetic Aperture Radar (InSAR) map that shows the surface displacement (wrapped interferogram) of the Mw 7.7 earthquake and its aftershocks along the Sagaing Fault. It is noted that Sagaing Fault marks the boundary between the Indian Plate and the Eurasian Plate. It is a strike-slip fault similar to the San Andreas Fault in the United States. Complementing the imagery are various datasets, including the mapping of the [earthquakes that occurred in the last 100 years](#) in Myanmar compiled by the Myanmar Information Management Unit (MIMU).

2.4 Development of AADMER Work Programme 2026–2030

ASEAN Agreement on Disaster Management and Emergency Response (AADMER), signed on 26 July 2005 and enforced on 24 December 2009, is a legally binding document that guides regional cooperation in disaster management and emergency response. Since its enforcement, three AADMER Work Programmes (AWP) have been developed by the ASEAN Committee on Disaster Management (ACDM): AWP 2010–2015, AWP 2016–2020, and AWP 2021–2025. For the next iteration, i.e., AWP 2026–2030, the ASEAN Secretariat appointed ADRC to facilitate its development starting January 2025.

2.4.1 Background

In facilitating the development of the AWP 2026–2030, ADRC considered the lessons from the 20 years of implementing AADMER, the outcomes of the ASEAN Vision 2025 on Disaster Management, the operations of the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre), and the mechanisms and broader partnerships for ASEAN disaster management. ADRC also aligned the development of AWP 2026–2030 with the ASEAN 2045: Our Shared Future, the ASEAN Socio-Cultural Community (ASCC) Strategic Plan, and other relevant ASEAN strategic documents and global frameworks.

2.4.2 Priority Programmes

Building on the achievements and lessons from previous AWP, ADRC noted that the next iteration should maintain the same priority programmes for continuity as well as to effectively address the multiple risks from climate changes and natural hazards. Like the previous iteration, the AWP 2026–2030 will consist of five Priority Programmes (PPs) with corresponding outcomes and outputs (Figure 2.9) that will contribute to achieving the vision, “a region of disaster-resilient nations, where disaster losses in lives, social, and environmental assets are substantially reduced through concerted national efforts, intensified regional and global cooperation and leadership, in pursuit of safer communities and sustainable resilience.”

Priority Programmes	Outcomes	Outputs
 PP1 Risk Assessment, Monitoring, and Early Warning	2	7
 PP2 Prevention and Mitigation	4	8
 PP3 Preparedness and Response	3	10
 PP4 Resilient Recovery	3	8
 PP5 Transformative Global Leadership	3	11
Total in AWP 2026-2030	15	44

Figure 2.9 Priority Programmes of AWP 2026–2030

PP1: Risk Assessment, Monitoring, and Early Warning is aimed at advancing a technically robust risk assessment and monitoring system while accelerating efforts to achieve multi-hazards early warning systems for all.

PP2: Prevention and Mitigation is aimed at strengthening risk governance for Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA), enhancing localization and whole-of-society approaches, and strengthening protection, gender, and inclusion (PGI), resilient economy and risk financing, and resilient human settlement.

PP3: Preparedness and Response is aimed at sustaining and further strengthening the utilization of tools and mechanisms for preparedness and response within the region and set new heights for their utilization, including readiness to respond to disasters beyond the region.

PP4: Resilient Recovery is aimed at achieving an inclusive and sustainable disaster recovery by strengthening capacity for recovery needs assessment, enhancing support for recovery planning, and developing a regional recovery assistance mechanism for large-scale disasters and ensuring multi-stakeholder engagement to achieve “build back better”.

PP5: Global Leadership is aimed at transforming the approach to global leadership in DRR by producing knowledge products that elevate the quality of the ASEAN regional knowledge hub in disaster management, ensuring coherent capacity building and disaster management professionalization, and continuous global thought leadership of ASEAN in influencing the global DRR policymaking and practicing, including the post-Sendai Framework for Disaster Risk Reduction processes.

2.4.3 Timeline

AWP 2026–2030 is expected to be adopted and launched at the 13th ASEAN Ministerial Meeting on Disaster Management (AMMDM), 13–17 October 2025 in Cambodia and to be noted by the Leaders at the 47th ASEAN Summit on 26 October 2025.

2.5 20th Commemoration of the Indian Ocean Tsunami

In line with the 20th Commemoration of the Indian Ocean Tsunami of 2004, ADRC teamed up with the Tsunami Disaster and Mitigation Research Center of the Universitas Syiah Kuala (TDMRC/USK) and BAPPEDA Aceh in organizing a series of activities in Banda Aceh, Indonesia.

2.5.1 International Seminar on Tsunami Disaster Mitigation

In this event, Dr MIFUNE Yasumichi and Dr Gerald Potutan (both from ADRC) served as keynote speakers. Dr Mifune shared insights on recovery from tsunami in the context of the Great East Japan Earthquake while Dr Potutan showed some practical examples from Japan on how to escape from tsunami and mitigate its impact on life and property.



Figure 2.10 Speakers of the International Seminar on Tsunami Disaster Mitigation

2.5.2 Field Visits

ADRC visited the following: 1) impacted areas of 2004 Aceh Tsunami, 2) Aceh Tsunami Museum, and 3) tsunami research facilities at TDMRC/USK.

(1) Impacted areas

Alue Naga, Tibang, Lamgugob, Rukoh, and Lampulo are sites in Banda Aceh located near the coast.

While construction of houses near the coast has been restricted, many new houses have been built. No vertical buildings or tsunami towers for evacuation could be found in the area (Figure 2.11).



Figure 2.11 New houses built near the coast in Banda Aceh

Banda Aceh's fishing industry is one of the reasons why new houses are being built, and for the same reason, even those who relocated after the 2004 Indian Ocean Tsunami have returned to the area for livelihoods.



Figure 2.12 Boats of diverse sizes in Banda Aceh indicating a flourishing fishing industry

(2) Aceh Tsunami Museum

Aceh Tsunami Museum features movie halls and thematic exhibits. The photos below show a glimpse of the museum's offerings.



Figure 2.13 Tsunami simulation screen (left) and “Bridge of Peace” following tsunami recovery (right)

(3) Tsunami Research Facilities at TDMRC

TDMRC/USK is in possession of recent state-of-the-art facilities for tsunami disaster mitigation research, such as those shown in Figure 2.14.

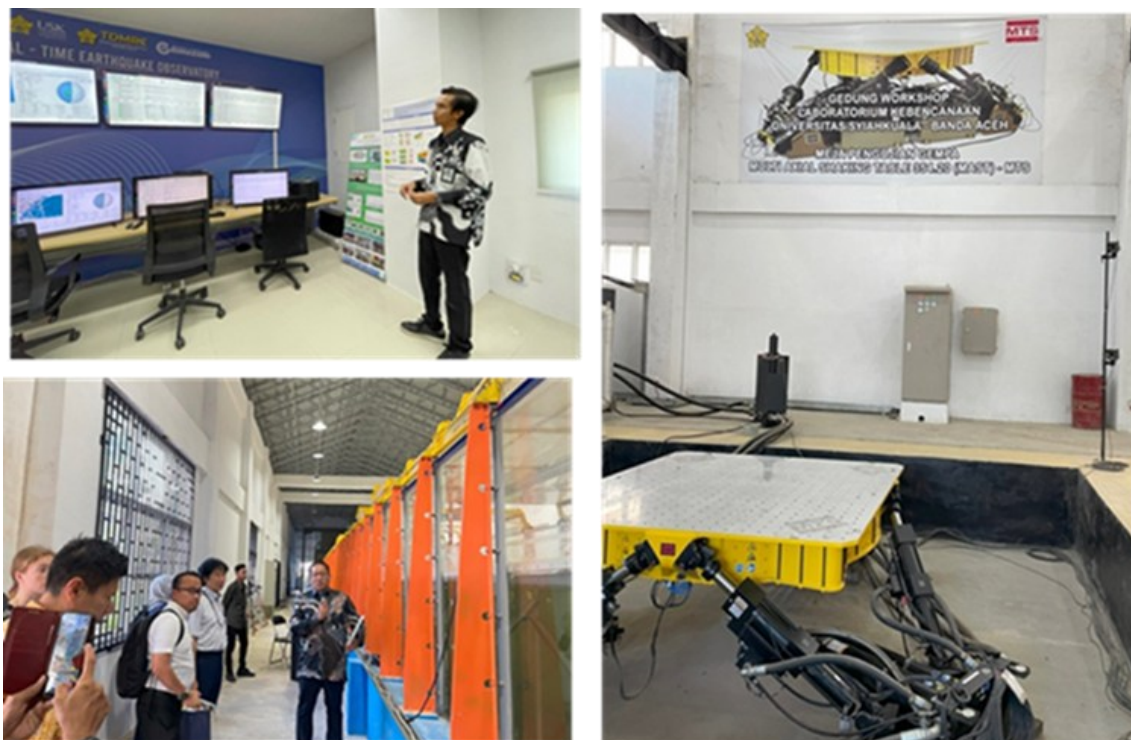


Figure 2.14 Real-time earthquake observatory (top left), tsunami modelling facility (bottom left), and seismic shaking table facility (right)

2.5.3 Interviews

ADRC also conducted separate interviews with Dr H.T. Ahmad Dadek, Head of BAPPEDA Aceh (a provincial branch of the Ministry of National Development Planning, BAPPENAS) and M. Syahputra Azwar, Head of Aceh Tsunami Museum to learn more about the lessons from tsunami.



Figure 2.15 Interview at BAPPEDA Aceh (left) and interview at Aceh Tsunami Museum (right)

2.5.4 International Seminar on Tsunami DRR-related Policies

Upon joint invitation by BAPPEDA and TDMRC, members of the ADRC team served as speakers to the *Seminar on Disaster Risk Reduction and Environmental Policies in Japan and Indonesia*, which was held on 6 November 2024. Speakers from ADRC shared the disaster management systems in Japan, highlighting key DRR policies and practices.



Figure 2.16 Participants of the International Seminar at BAPPEDA

3. Information Sharing on DRR

3. Information Sharing on DRR

ADRC shares DRR information to member countries and the general public primarily through its website <https://www.adrc.asia/latest/>. Online information includes documented experiences, lessons, tools, practices, and analyses of data that are useful for preparedness, mitigation, response, and recovery activities.

3.1 Information Collection

ADRC collects pertinent DRR information from member countries, partner organizations, and networks, primarily on the following:

- Disaster risk management systems (e.g., legal and institutional frameworks, disaster management plans, and manuals)
- Disaster response and recovery activities (e.g., emergency response activities in affected area/country)
- Disaster events due to natural hazards (e.g., descriptions of natural disasters such as earthquakes, floods, cyclones, and so on, and the damages)

The VRs and the UNOCHA contribute in the information collection efforts of ADRC.

3.1.1 Country Reports on DRR

Member countries submit their respective updated country reports to ADRC on a regular basis. These reports contain information about natural hazards, disaster management systems, DRR strategy/plan, recent disasters, and progress in implementing the Sendai Framework for Disaster Risk Reduction. Table 3.1 shows the updated record for FY2024.

Table 3.1 List of reports from ADRC member countries

Country	Year prepared (Update frequency is different as it is made by VRs of the year.)
Republic of Armenia	2001, 2002, 2003, 2005, 2006, 2010, 2012, 2015, 2016, 2017, 2021, 2022
Republic of Azerbaijan	2011, 2014, 2023
People's Republic of Bangladesh	1998, 1999, 2001, 2003, 2005, 2006, 2010, 2011, 2013, 2020, 2021
Kingdom of Bhutan	2008, 2013, 2014, 2017, 2019
Kingdom of Cambodia	1998, 1999, 2002, 2003, 2005, 2006, 2013
People's Republic of China	1998, 1999, 2005, 2006, 2012
Republic of Fiji	2024
Republic of India	1998, 1999, 2002, 2005, 2006, 2008, 2012, 2015, 2018, 2020, 2022, 2023, 2024
Republic of Indonesia	1998, 1999, 2002, 2003, 2004, 2005, 2006, 2012, 2016
Islamic Republic of Iran	2013
Japan	1998, 1999, 2002, 2005, 2006, 2012, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023

Country	Year prepared (Update frequency is different as it is made by VRs of the year.)
Republic of Kazakhstan	1998, 1999, 2002, 2005, 2006
Republic of Korea	1998, 1999, 2001, 2002, 2005, 2006, 2008, 2024
Kyrgyz Republic	2005, 2006, 2012
Lao People's Democratic Republic	1998, 1999, 2003, 2005, 2006, 2023
Malaysia	1998, 1999, 2003, 2005, 2006, 2008, 2009, 2011, 2018, 2024
Republic of Maldives	2013, 2014, 2015, 2018, 2023, 2024
Mongolia	1998, 1999, 2002, 2005, 2010, 2011, 2013, 2021, 2022
Republic of the Union of Myanmar	2002, 2005, 2006, 2013, 2018, 2020, 2021, 2022
Nepal	1998, 1999, 2005, 2006, 2009, 2010, 2011, 2014, 2019
Islamic Republic of Pakistan	2005, 2006, 2009, 2015, 2016, 2017, 2021, 2022
Independent State of Papua New Guinea	1998, 1999, 2005, 2006
Republic of the Philippines	1998, 1999, 2002, 2003, 2005, 2006, 2009, 2010, 2011, 2012, 2014, 2016, 2017, 2018
Russian Federation	1998, 1999, 2003, 2005, 2006
Republic of Singapore	1998, 1999, 2001, 2002, 2003, 2005, 2006
Democratic Socialist Republic of Sri Lanka	1998, 1999, 2003, 2005, 2006, 2009, 2010, 2011, 2014, 2015, 2016, 2019
Republic of Tajikistan	1998, 1999, 2003, 2005, 2006
Kingdom of Thailand	1998, 1999, 2003, 2004, 2005, 2006, 2008, 2010, 2011, 2012, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023
Republic of Türkiye	2019, 2024
Republic of Uzbekistan	1998, 1999, 2005, 2006, 2013, 2015
Socialist Republic of Viet Nam	1998, 1999, 2005, 2006, 2017, 2021, 2022, 2023
Republic of Yemen	2009, 2012, 2014

3.1.2 Latest Disaster Information (FY2024)

As of 20 February 2025, a total of 2,738 disaster information items can be accessed on the [ADRC website](#). Once a disaster occurs, the latest disaster information is immediately posted. Each disaster information contains details, e.g., date of occurrence, location, impacts, and links to reports, articles, maps, relief efforts, and satellite images. Aside from the Myanmar Earthquake, the following are descriptions of other notable disasters that occurred during FY2024.

(1) Typhoon Yagi

Typhoon Yagi affected several countries in Asia, including the Philippines ([TC-2024-000161-PHL](#)), Lao PDR ([TC-2024-000161-LAO](#)), Thailand ([TC-2024-000161-THA](#)), Myanmar ([TC-2024-000161-MMR](#)), and Viet Nam ([TC-2024-000161-VNM](#))—the most impacted. Yagi was the strongest typhoon to hit Viet Nam in 70 years, causing severe flooding and landslides.

(2) Taiwan earthquake

A Mw 7.4 earthquake ([EQ-2024-000040-TWN](#)) struck southwest of Hualien City, Taiwan on 3 April 2024 damaging homes, businesses, schools, and communication and transportation infrastructure. The earthquake reportedly killed 18 people and injured more than 1,100 people. Impacts of the earthquakes were effectively reduced due to Taiwan's investment in early warning systems and earthquake preparedness, including strict building codes and regulations, widespread public education, robust emergency and response measures.

(3) Floods in Malaysia and Thailand

In late November 2024, Thailand ([FL-2024-000217-THA](#)) and Malaysia ([FL-2024-000218-MYS](#)) were hit by severe flooding, causing millions of dollars in damage to farmers, submerging rice fields and damaging roads, houses and public infrastructure. At least 25 districts in seven Malaysian states (Johor, Kedah, Kelantan, Perak, Perlis, Sarawak and Terengganu) were affected by floods, displacing 52,360 people. Authorities activated 385 evacuation centers to support the displaced population. In Thailand, the Department of Disaster Prevention and Mitigation (DDPM) reported flooding over the Southern Region.

Detailed information of these disasters is accessible on the ADRC database due to the contributions and support from reliable members and partners that provide the data. As shown in Figure 3.1, latest reports consist of three items: disaster information (e.g., date of occurrence, place, and scale); damage information (e.g., casualties, missing, and damages); and geographic information (e.g., maps, aerial imagery, and elevations).

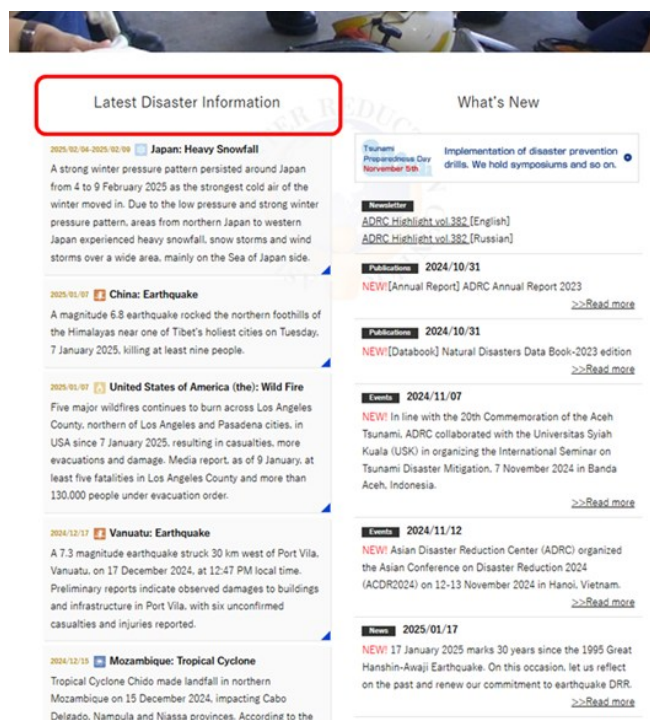


Figure 3.1 Screenshot of ADRC Homepage with latest disaster information

In most cases, ADRC uses information provided by the ReliefWeb operated by UNOCHA, United States Geological Survey (USGS), member countries, media, and other partner organizations.

3.1.3 Natural Disaster Databook 2023

ADRC publishes the Natural Disaster Databook annually to provide statistical and analytical overview of disaster and COVID-19 data. For 2023, datasets from the Emergency Event Database (EM-DAT) and the World Health Organization (WHO) were respectively downloaded on 25 March 2024 and 10 July 2024 for analytical overview. With regard to natural disaster, the analysis covers occurrences of disaster events, deaths, people affected, and economic losses focusing on seven disaster types: drought, earthquake, extreme temperature, flood, storm, wildfire, and volcanic activity. With regard to COVID-19, the analysis shows the trend of confirmed cases and deaths.

The statistical overview in this Databook is focused on:

- Comparing the natural disaster data of 2023 with the annual average of the last 30-year (1993–2022)
- Comparing the climate-related disaster data of 2023 with the annual average of the last 30-year (1993–2022)
- Analysis of COVID-19 data up to 2023 since the WHO declared it as a global pandemic on 11 March 2020 by comparing the global trend with the situations of ADRC member countries

Of the 374 disaster occurrences recorded in 2023, the Türkiye-Syria earthquakes of 6 February was the most notable event due its massive impacts: over 55,000 deaths, more than 23 million people affected, and staggering economic losses of over USD100 billion. While this Databook can show the general data on deaths, people affected, and economic losses, it cannot show the detailed disaggregated data of impacts by gender, location, or sector.

If we look at the disaster occurrences in 2023, the recorded number of events (374 events) is higher by 13% compared to the annual average for the past 30 years (1993–2022), which is 330 events/year. The most frequent occurrences were floods (44% or 163 events), storms (37% or 139 events), and earthquakes (9% or 32 events). As observed, devastating floods were experienced in India, Guatemala, Tanzania, Nigeria, Yemen, Somalia, Philippines, Italy, and Congo. Storms affected Libya (Daniel), Malawi (Freddy), India (Michaung), China (Doksuri), and Mexico (Otis). Earthquakes struck Türkiye, Syria, Morocco, and Afghanistan while droughts lingered in Indonesia and United States of America.

Data in Asia shows an increasing number of disaster occurrences in 2023 with 152 events compared to the annual average for the past 30 years (1993–2022), which is 132 events/year. We observed that in terms of deaths, there is an increasing trend both globally and in Asia. In terms of people affected, there is a decreasing trend both globally and in Asia, which can be attributed to the improvements in DRR measures. In terms of economic losses, the data shows an increasing trend both globally and in Asia. Although economic losses generally show an increasing trend, it is not the case for flood in 2023.



Figure 3.2 Cover photo of the Natural Disaster Databook 2023

One key observation that can be highlighted in the Databook is that economic losses from disasters in 2023 amounted to USD202.11 billion, which is higher than the annual average for the past 30 years of USD124.33 billion/year (Figure 3.3). About half (USD100.85 billion) of the total economic losses in 2023 is attributed to storm disasters. Similar trend is shown over the last 30 years (1993–2022), where storms accounted for the most economic losses with an average of USD56.86 billion/year. Although we can observe an increasing trend of economic losses in wildfire, storm, earthquake, and drought, the economic losses from flood (USD20.37 billion) shows a decreasing trend in 2023 compared with the annual average of the past 30 years (USD30.06 billion/year).

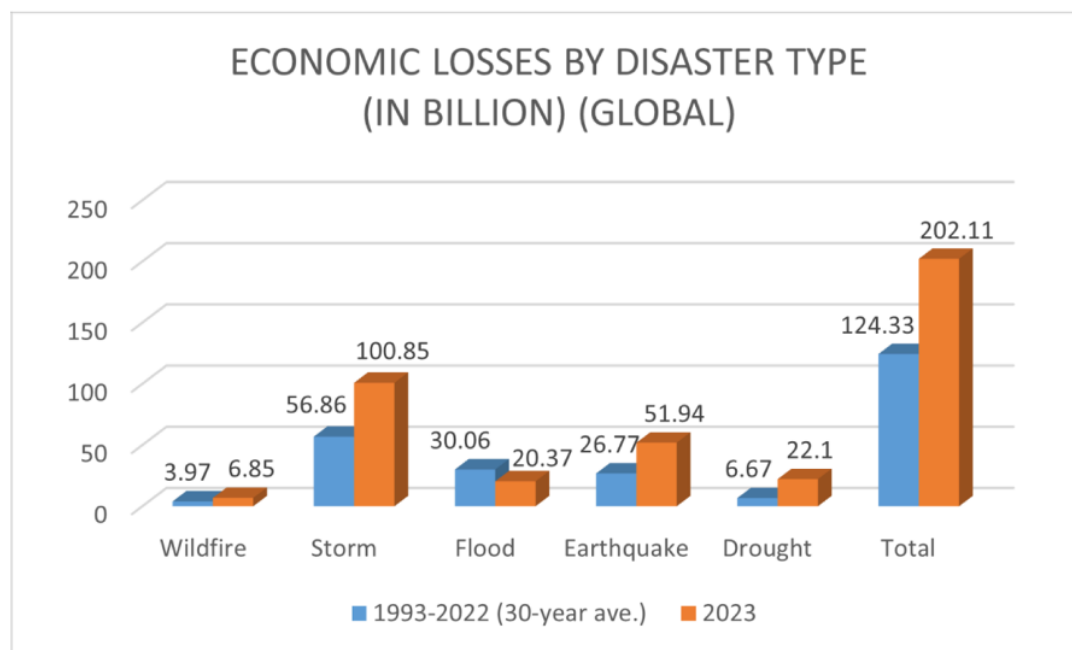


Figure 3.3 Global economic losses by disaster type (in billion) 1993–2022 average vs 2023

Since climate change is attributed as one of the reasons for the increasing disaster trend (i.e., rising temperature increases the moisture the atmosphere can hold, resulting in more storms and heavy rains), this Databook also looks at the trend of climate-related disasters, particularly drought, storm, flood, and extreme temperature. In 2023, global temperature reached exceptionally high, close to 1.5°C limit. Temperatures from June onwards made 2023 the warmest year on record, overtaking by a large margin the 2016 data.

The Databook noted that the cases and deaths from COVID-19 have remarkably declined in May 2023, as many countries around the world stopped recording and reporting the data to WHO. Corollary to that, governments had lifted all COVID-19 travel restrictions (e.g., proof of vaccination to enter a country) signifying that the pandemic was over. So available data from WHO in 2023, showed a cumulative total of 773,940,523 confirmed cases and 7,015,982 deaths. The data indicates that the last highest number of confirmed cases on a single day was still the reported information on 19 December 2022 with 44.20 million cases. However, in 2023, cases from COVID-19 had drastically declined until the end of the year. Likewise, the number of deaths had also significantly declined in 2023. The explanations for these can be largely attributed to the improvements in treatments, health measures, widespread vaccination, and natural immunity. As far as the ADRC member countries are concerned, the number of deaths from COVID-19 also significantly declined since the beginning of 2023 until the end of that year.

3.2 Information Dissemination

ADRC disseminates DRR information using a range of channels, including: a) regular issuance of ADRC Highlights, a monthly newsletter, b) dissemination via GLIDE, and c) dissemination through Sentinel Asia, a space-based and service providing platform.

3.2.1 ADRC Highlights

ADRC has been using Internet and e-mail to share information with its counterparts in the member countries, and other relevant parties. As one of its important tools for information dissemination, ADRC has been issuing the newsletter “ADRC Highlights” since 1 June 1999. It had been issued twice a month until FY2007, and has been issued once a month since the renewal of its design in FY2008.



Figure 3.4 ADRC Highlights December 2024 Issue in Japanese, English, and Russian edition

The newsletter is made available on the website. Its text version is also e-mailed in English, Russian and Japanese to ADRC counterparts, former VRs, former GLIDE visiting researchers, participants in the past ADRC annual meetings, visitors to ADRC, trainees in JICA's courses, and participants in international conferences which ADRC took part in. Also, ADRC registers the e-mail addresses of those who wish to subscribe to the newsletter as well as those who joined ADRC webinars in the past. ADRC has been updating its mailing lists regularly, especially for the last few years to deliver the newsletter more effectively and efficiently to readers.

As of 28 February 2025, the numbers of subscribers are recorded as following English (2,807), Russian (226), and Japanese (944). Regular contents of the newsletter include articles on the latest ADRC activities, VR Program, Asian Conference on Disaster Reduction, reports on participation in international conferences, and other events or projects organized or supported by ADRC.

3.2.2 Data Sharing through GLIDE Number System

As of March 2025, over 8,300 GLIDE numbers were issued to support the integration of disaster data and to inform the disaster preparedness, response, and recovery activities of member countries. GLIDE stands for “GLobal unique disaster IDentifier”. The GLIDE number system assigns a “global ID” to a disaster so that stakeholders can commonly identify it, despite its different name or language. If institutes and organizations use GLIDE number in reporting certain disaster event, all related information of that event can be integrated in the databases. A GLIDE number (e.g., [EQ-2024-000001-JPN](#)) comprises the following components: disaster

classification (e.g., EQ for earthquake), year of occurrence, serial number in the given year, and country code. Once a disaster occurs, an operator issues a GLIDE number by inputting disaster information such as location, time, disaster type, and initial damage and then uploaded on the GLIDE website. The number is automatically sent to its over 2,000 subscribers.

Established in 2001, GLIDE aims to promote disaster information sharing among databases developed by DRR organizations, research institutions, and governments to contribute in strengthening disaster resilience. ADRC advocates the use of GLIDE number to further facilitate information integration, such as information on damage and loss that maybe available other reports but could not be found since the organization did not use GLIDE number. Efforts along this line includes linking GLIDE with other disaster data management tools (e.g., ReliefWeb, Sentinel Asia, UNOSAT, ADINet, and ESCAP). In 2021, GLIDE API was adopted to facilitate automatic issuance of GLIDE number by institutions that maintain disaster databases.

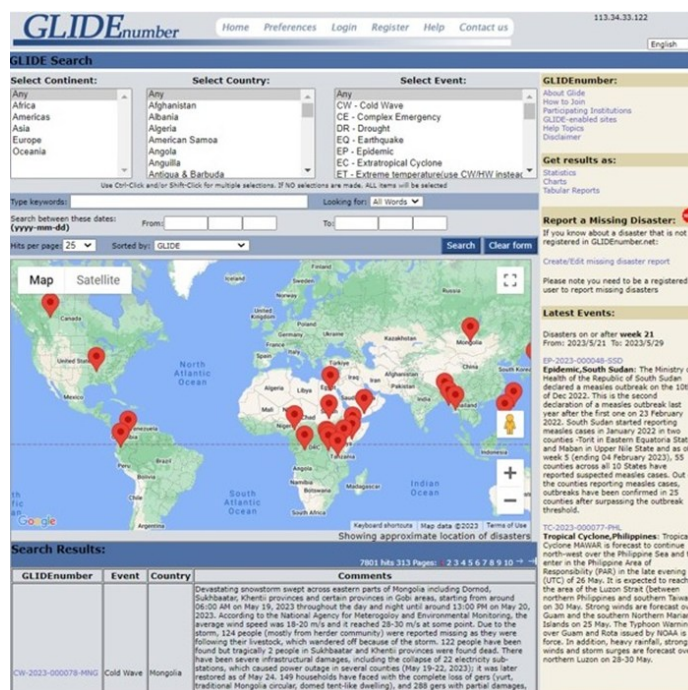


Figure 3.5 Screenshot of GLIDE Homepage

3.2.3 Data Sharing through Sentinel Asia

Upon request from member countries, ADRC facilitates the sharing of satellite images of emergency observations through Sentinel Asia to help provide information for their disaster response and recovery plans. In FY2024, Sentinel Asia received a total of 68 requests from the Joint Project Team (JPT) members and 64 requests were activated (Figure 3.6).

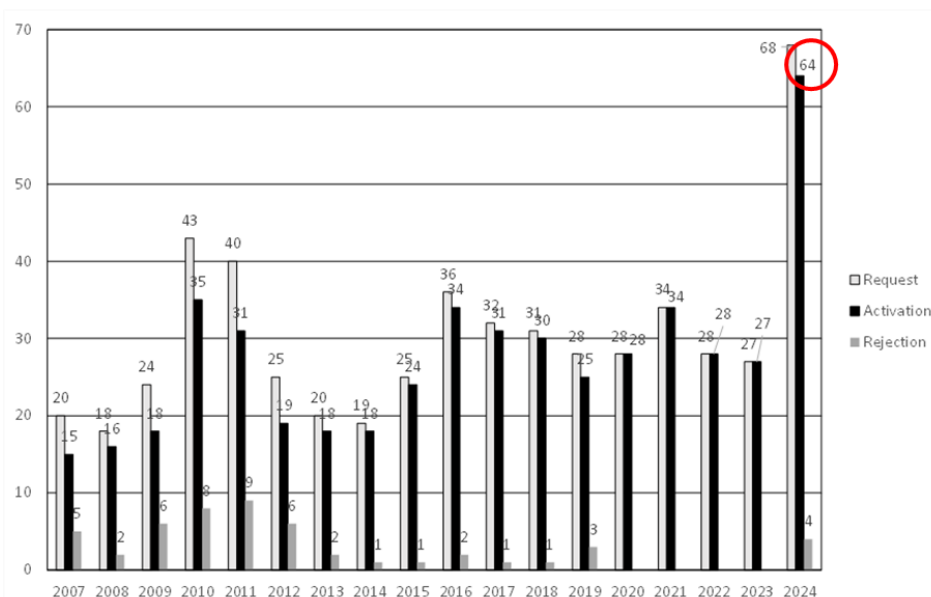


Figure 3.6 Emergency observation requests record 2007–2024

Sentinel Asia is a network with a wide-range of memberships. As of August 2025, the JPT membership comprises 127 organizations from 30 countries/regions. It supports disaster management activity in the Asia-Pacific region by applying space-based technology (i.e., earth observation satellites data) and Web-GIS technology. When a member country sends an emergency observation request, ADRC forwards it to the eight space agencies under Sentinel Asia: ISRO (India), JAXA (Japan), MBRSC (United Arab Emirates), STI/VAST (Viet Nam), GISTDA (Thailand), TASA (Taiwan), CRISP (Singapore), and PhilSA (Philippines). While the number of requests for emergency observation has been changing from year to year, the ratio of activation remains stable at around 90%.

Using earth observation satellites is effective in analyzing the disaster impacts of affected areas, as it provides actionable data to responders and local communities. Under the International Disaster Charter (IDC) framework, which was adopted in 2000, data provision in times of disaster has been advocated. Within this framework, ADRC functions as the focal point to receive emergency observation request of the Sentinel Asia. Additionally, ADRC also serves as [UN-SPIDER](#) Regional Support Office (RSO) to ensure access and development of capacity to use space-based information for disaster management in Asia.

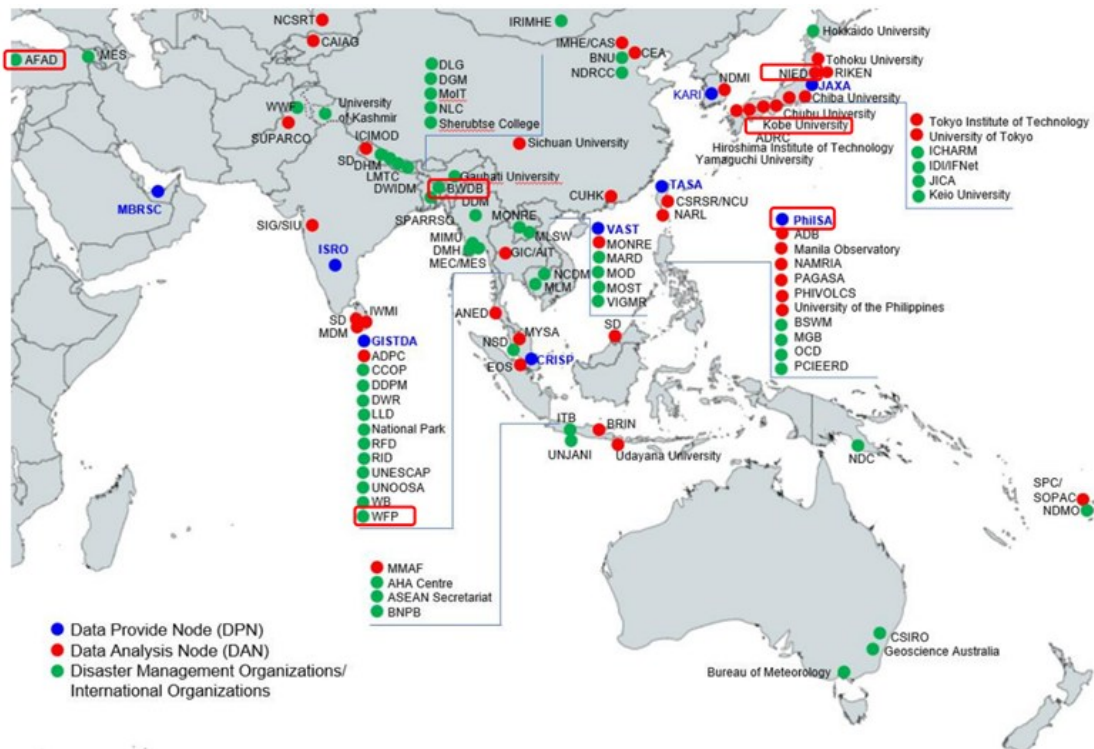


Figure 3.7 Sentinel Asia Network

4. Human Resource Development

4. Human Resource Development

ADRC enhances the DRM capacities of member countries through the Visiting Researcher (VR) Program, seminars, workshops, training events, and other DRR-related human resource development activities.

4.1 Visiting Researcher (VR) Program

As of March 2025, a cumulative total of 138 VRs from 28 countries had participated in the programme since it started in 1999 (Table 4.1). This programme aims at achieving the following objectives:

- To accumulate information on the latest disasters, disaster management policies, laws, plans, budget, and progress of the Sendai Framework for Disaster Risk Reduction of member countries to strengthen their disaster resilience;
- To compose an effective human resource development programme in accordance with the needs and priorities of member countries and VRs, and seek improvement measures for specific issues through training with experts;
- To continue improving the VR Program through their feedback and evaluation; and
- To maintain communication with alumni of the VRs and establish communication with new VRs.

Each year, six officials or practitioners in disaster risk reduction and management visit Japan to gain greater understanding of disaster management systems and to contribute to the implementation of the Sendai Framework for Disaster Risk Reduction in their respective countries. In this context, the VR Program is aimed at developing human resources, strengthening disaster response capabilities, and enhancing the ties between member countries and ADRC.

4.1.1 Activities During the Programme

In FY2024, six VRs from Fiji, India, Republic of Korea, Malaysia, Maldives, and Türkiye came to Japan to participate in the programme (Figure 4.1). During their stay, the VRs learned about innovative and practical DRR technologies and established greater cooperation and collaboration with other national governments, international organizations, and DRR agencies.

Table 4.1 Cumulative total of VRs as of March 2025

Armenia	9
Azerbaijan	3
Bangladesh	6
Bhutan	4
Cambodia	4
China	3
Fiji	1
India	10
Indonesia	3
Iran	1
Republic of Korea	4
Kyrgyz Republic	2
Lao PDR	3
Malaysia	5
Maldives	6
Mongolia	6
Myanmar	5
Nepal	9
Pakistan	6
Papua New Guinea	1
Philippines	9
Sri Lanka	11
Tajikistan	2
Thailand	12
Türkiye	2
Uzbekistan	2
Viet Nam	6
Yemen	3
Total	138

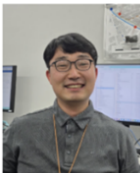
MS. Uaniseva Lita Megan Ledua (Fiji) FY2024  Senior Administrative Officer-GIS National Disaster Management Office (NDMO), Ministry of Rural and Maritime Development and Disaster Management More information on Disaster Management of Fiji: Country Report of Fiji	Ms. Che Siti Noor Binti Che Mamat (Malaysia) FY2024  Principal Assistant Director, Division of Operations Coordination National Disaster Management Agency (NADMA), Prime Minister's Department More information on Disaster Management of Malaysia: Country Report of Malaysia
Ms. Preeti Negi (India) FY2024  Training and Capacity Building Coordinator Mandi District Disaster Management Authority, Himachal Pradesh More information on Disaster Management of India: Country Report of India	Mr. Hussain Naseem (Maldives) FY2024  Senior Administrative Officer National Disaster Management Authority (NDMA) More information on Disaster Management of Maldives: Country Report of Maldives
Mr. Lee Young-Kyu (Republic of Korea) FY2024  Senior Researcher Korean Fire Protection Association (KFPA) More information on Disaster Management of Republic of Korea: Country Report of Republic of Korea	Ms. Betül Kurada (Türkiye) FY2024  Head of Project Management Office Disaster and Emergency Management Authority (AFAD), Ministry of Interior More information on Disaster Management of Türkiye: Country Report of Türkiye

Figure 4.1 ADRC VRs for FY2024

On 21 March 2024, all six VRs presented the outcomes of their research activities. Their final reports reflected the accumulation of DRR knowledge, the characteristics of latest disasters and disaster management policies/laws/plans/budget, and the measures to strengthen resilience in each of their countries. The topics of their respective researches are as follow:

Fiji: Enhancing Flood Management and Mapping in Fiji through GIS

India: Strengthening Community Disaster Preparedness Capacity in India

Republic of Korea: Building a Database of Disaster Propagation Patterns for Strengthening Disaster Response Capacities

Malaysia: Improving Disaster Preparedness in Malaysia

Maldives: Community Practices for DRR in Maldives

Türkiye: Adaptation and Risk Reduction to Disasters Caused by Climate Change

In conducting their research activities, ADRC assigned a mentor to each VR to guide and assist in the entire process.

4.1.2 Networking of Visiting Researchers

After completing the programme, the participants are automatically enrolled in the network of former VRs. ADRC cooperate in various ongoing projects through this network for effective and efficient implementation. Additionally, VRs are engaged to design new projects tailored to the local conditions. Furthermore, former VRs are contacted whenever ADRC intends to suggest policy updates or extends support to their home countries

based on the request or information they provided. New VRs are encouraged to contact former VRs to establish communication, share experiences, and insights.

During the Sentinel Asia activity in Kyrgyz Republic on 10 October 2024, ADRC and JAXA representatives visited the Ministry of Emergency Situations (MoES) facilitated by Mr Karybai uulu Kanatbek, 2007 VR, to introduce and discuss new project that utilizes satellite data in disaster management (Figure 4.2). As indicated earlier, Sentinel Asia provides satellite imagery and analysis maps at the request of its members. To improve the service, Sentinel Asia gathers feedback on how data is actually utilized for DRR activities.



Figure 4.2 Mr Kanatbek (second from left) during ADRC and JAXA's visit

Many of the former VRs also participate in the annual Asian Conference on Disaster Reduction (ACDR), where they are given opportunity to make presentations (Figure 4.3).



Figure 4.3 Ms Thai Minh Huong (VR in FY2022) and Ms Vu Doung Thuy (VR in FY2023) at ACDR2024 in Hanoi

4.2 JICA Knowledge Co-creation Program

Under the Knowledge Co-creation Program, Japan International Cooperation Agency (JICA) commissioned ADRC to conduct comprehensive training courses on DRR based on the “themes of interest” of each region/country. As shown in Table 4.2, ADRC implemented six training courses in FY2024, namely: 1) Comprehensive DRR for Central and South America, 2) Comprehensive DRR for Central Asia and Caucasus; 3) Malaysia “LEP 2.0 Enhancement of the Disaster Risk Management Capacity of the National Disaster Management Agency (NADMA)” Pre-Disaster Investment and Risk Understanding; 4) Promotion of Mainstreaming Disaster Risk Reduction toward a More Resilient Society; 5) Comprehensive DRR Considering Climate Change for the African Region; and 6) Comprehensive Disaster Risk Reduction (Toward a Resilient Society).

Table 4.2 JICA KCCP implemented by ADRC in FY2024

No.	Dates	Number of Countries	Number of Participants
1	20 May – 11 Jul 2024	<u>12 countries</u> : Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, Panama, and Peru	14
2	17 Jun – 8 Aug 2024	<u>4 countries</u> : Kazakhstan, Kyrgyz Republic, Tajikistan, and Uzbekistan	6
3	2–13 Sep 2024	<u>1 country</u> : Malaysia	14
4	30 Sep – 18 Oct 2024	<u>6 countries</u> : Egypt, Georgia, Indonesia, Mongolia, Pakistan, and Sri Lanka	7
5	25 Nov 2024 – 4 Feb 2025	<u>8 countries</u> : Cabo Verde, Kenya, Madagascar, Mauritius, Mozambique, Rwanda, Senegal, and Somali	8
6	9 Dec 2024 – 20 Feb 2025	<u>5 countries</u> : Kosovo, Pakistan, Türkiye, Viet Nam, and Yemen	6

4.2.1 Comprehensive DRR for Central and South America

This course was conducted from 20 May to 11 July 2024 with 14 participants from 12 Central and South American countries: Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, Panama, and Peru. It consisted four weeks of online learning and four weeks of face-to-face activities in Japan, learning about innovative technologies in disaster risk reduction. It also included site visits to Hyogo, Tokyo, and Iwate Prefectures to observe various countermeasures including sediment-related disaster countermeasures at the Nigawa Landslide Museum and flood control measures at Kitakami River in Ichinoseki City. At the end of the course, the participants developed a draft local DRR plan using the 8-Step Approach. After returning to their respective countries, they are expected to actively engage in DRR measures to reduce humanitarian and economic losses due to disasters.



Figure 4.4 Study visit to the Nigawa Landslide Museum (catchment well) in Hyogo Prefecture

4.2.2 Comprehensive DRR for Central Asia and Caucasus

This course was conducted from 17 June to 8 August 2024 with six participants from four countries: Kazakhstan, Kyrgyz Republic, Tajikistan, and Uzbekistan. Participants learned how to formulate and implement local DRR plans for their respective home countries.

The first four weeks of the course consisted of online lectures and exercises, and in the latter three weeks, face-to-face programmes were conducted in Japan. The programmes in Japan included lectures at DRR-related organizations in Hyogo, Osaka, and Nara Prefectures. During the field observations, participants learned about 1) landslide countermeasures after the 2004 Niigata Chuetsu Earthquake, and 2) erosion and flood control measures for the Joganji River basin in Toyama Prefecture. In addition, the participants formulated a draft local DRR plan through the exercises and discussions. Participants were expected to apply what they learned from the course to their future work.



Figure 4.5 Participants observing flood control measures along Joganji River

4.2.3 Malaysia “LEP 2.0 Enhancement of the Disaster Risk Management Capacity of the National Disaster Management Agency (NADMA)” Pre-Disaster Investment and Risk Understanding

This course was conducted on 2–13 September 2024 with 14 officials from the National Disaster Management Agency (NADMA) Malaysia. After completing the course, participants were able to: 1) systematically learn about disaster risks and understand disaster risk reduction methods by attending lectures and visiting sites related to pre-disaster investment and response to residual risks implemented by national and local governments, especially for flood and sediment disasters, and 2) develop an action plan for their organization to accelerate disaster mitigation.

Participants generally learned about the DRR policies and practices in Japan through their visit to Tokyo, Ibaraki, Shizuoka, and Kobe.



Figure 4.6 Participants visited Arakawa-Karyu River Office

4.2.4 Promotion of Mainstreaming Disaster Risk Reduction toward a More Resilient Society

This course was conducted from 30 September to 18 October 2024 with seven participants from six countries: Egypt, Georgia, Indonesia, Mongolia, Pakistan, and Sri Lanka. Participants visited agencies in Tokyo to deepen their understanding of DRR measures in Japan as well as efforts of the private sector and the media. They also visited the Tajimi Erosion Control Dam (Gifu Prefecture), the Nigawa Landslide Museum (Hyogo Prefecture), and the Disaster Reduction and Human Renovation Institution (DRI, Hyogo Prefecture) to learn various examples of Japan's disaster experiences and lessons. After the course, participants are



Figure 4.7 Participants during one of the lectures at JICA Kansai

expected to gain greater understanding of the importance of DRR investment and the lessons learned from Japan's experiences and also to be able to build strong bonds that transcend national boundaries.

4.2.5 Comprehensive DRR Considering Climate Change for the African Region

This course was conducted from 25 November 2024 to 4 February 2025 with eight participants from eight countries: Cabo Verde, Kenya, Madagascar, Mauritius, Mozambique, Rwanda, Senegal, and Somalia.

Each participant formulated a draft local DRR plan using 8-Step Approach to be applied in their respective countries. The participants attended lectures, conducted site visits, and made a community-based hazard map through town watching approach. All participants also drafted an action plan, applying what they learned in the course, to be implemented in their respective countries.



Figure 4.8 Participants making hazard maps through town watching exercise

4.2.6 Comprehensive Disaster Risk Reduction (Toward a Resilient Society)

This course was conducted from 9 December 2024 to 20 February 2025 with six participants from five countries: Kosovo, Pakistan, Türkiye, Viet Nam, and Yemen. Participants learned how to formulate and implement local DRR plans for their respective home countries. It was conducted in a hybrid format, where participants attended online programmes before coming to Japan for the in-person programme. During the five-week programme in Japan, the participants attended site visits and lectures at disaster-related organizations/facilities in Hyogo, Nara, and Kumamoto Prefectures, and participated in events related to the 30th commemoration of the Great Hanshin-Awaji Earthquake, to learn about Japanese experiences and countermeasures. Participants also exchanged information and discussed each country's budget and policy issues to promote DRR. At the end of the course, they presented a draft local DRR plan, which they formulated through the programme.



Figure 4.9 Participants sharing ideas on their challenges in DRR

4.3 Short-Term Programmes

ADRC regularly conducts short-term training events promoting DRR. In FY2024, government officials, academics, and students from overseas and Japan participated in the short-term training programmes.

4.3.1 BMKG Training in Japan

Through the request of the Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG), ADRC conducted a training programme to improve the capabilities of 30 BMKG officers in earthquake early warning systems from 17 November to 14 December 2024. Participants visited DRR institutions involved in disaster management and undertook practical training. They attended lectures on seismology, Japan's early warning

system, and recent research cases from the University of Tokyo, Tohoku University, and Kyoto University. Participants also learnt about the government's DRR efforts at the Cabinet Office of Japan, and in Fujisawa City. They toured areas affected by the 2011 Great East Japan Earthquake and visited earthquake ruins and museums related to the disaster. There were also lectures on the latest earthquake disaster prevention measures from private companies involved in railroads, disaster maps using satellite images, warning devices, and communications. Participants were able to learn about disaster prevention in Japan and the latest efforts in the development of earthquake early warning systems, which was one of the main themes of the programme. We hope that their experience and knowledge will contribute to the development of a system in Indonesia in the future.



Figure 4.10 Tour at TOA Knowledge Square (left), Lecture by Dr KODERA Yuki, Meteorological Research Institute (right)

4.3.2 AHA Centre ACE-LEDMP: Study Visit to Japan

From 13 to 20 October 2024, ADRC coordinated the Study Visit to Japan for the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre) Executive Leadership in Emergency Management Programme (ACE-LEDMP) Executive Level organized by the AHA Centre.

The study visit welcomed 20 prospective executive level officials with less than five years' experience in disaster management organizations from 10 ASEAN Member States (AMS) and Timor-Leste, along with four staff members from the AHA Centre. They received lectures from the Cabinet Office, Kobe City, the Arakawa Karyu

River Office, JICA and ADRC. They also visited the Disaster Reduction and Human Renovation Institution (DRI), the Tsunami and Storm Surge Disaster Prevention Station, the Nojima Fault Preservation Museum, and Kyoto University's Ujigawa Open Laboratory to deepen their understanding of Japan's disaster management policies.



Figure 4.11 ACE-LEDMP Participants at the Cabinet Office Japan

At the end of the visit, the participants presented their findings and shared ideas on how to advance disaster management efforts in their respective countries. Upon their return to Indonesia, the participants continued to review and reflect on their experiences from the visit in Japan.

4.3.3 Crash Course on Implementing DRR in Post-event Scenario

On 20–21 February 2025, the head of the Global Education and Training Institute of the United Nations Office for Disaster Risk Reduction (UNDRR/GETI), Mr Sanjaya Bhatia, visited ADRC to conduct a two-day workshop on “Implementing DRR in Post-event Scenario”. After the facilitators presented the scenario on extreme flooding, the current VRs of ADRC discussed the anticipated impacts flooding on various sectors such as housing, infrastructure, and livelihoods. During the workshop, the VRs worked on the following in their respective groups: 1) identifying the areas of DRR interventions; 2) identifying the support functions; 3) identifying the national and local support partners; and 4) listing of strategies and actions for DRR in post-event scenario. The groups presented their respective outputs followed by discussions further inputs from the facilitators.



Figure 4.12 Mr Sanjaya Bhatia of UNDRR/GETI during his lecture at ADRC

4.3.4 Internships at ADRC

During his internship from 1 to 19 July 2024, Mr Tatul Atalyan (a PhD student from Armenia specializing in Disaster Risk Management at Ehime University) contributed to the development of the Natural Disaster Databook 2023. His role involved analysing and comparing data on natural disasters in 2023 with the past 30 years (1993–2022). His analysis was focused on occurrences, deaths, affected populations, and economic losses. He also analysed climate-related disasters during the same periods. Throughout his internship, Mr Atalyan said, “I gained valuable insights and developed key skills. I adopted the discipline, time management, and teamwork practices inherent in the Japanese work environment, enhancing my understanding of Japanese working culture.” Mr Atalyan chose to intern at ADRC reading the institution’s background. “I improved my ability to produce insightful tables and graphs from complex datasets and strengthened my analytical skills by interpreting and presenting detailed information effectively,” Mr Atalyan added.



Figure 4.13 Mr Tatul Atalyan during his internship at ADRC

5. Cooperation and Partnerships

5. Cooperation and Partnerships

ADRC forges cooperation and partnerships among member countries and partner organizations to advance disaster resilience. In particular, ADRC engages in research cooperation (e.g., feasibility study on application of new technology) and partnerships with international institutions in organizing learning events.

5.1 Research Cooperation

Among the research projects that ADRC engaged in FY2024 includes the Advanced Studies on Climate Change Projection ([SENTAN](#)), Citizen Empowerment Program for DRR, [Mt. Fuji Disaster Drill](#), and SATREPS.

5.1.1 Advanced Studies on Climate Change Projection

ADRC, together with over 120 researchers and 43 cooperating organizations, is engaged in Area Theme 4: “Development of Hazard Integrated Prediction Model” of the SENTAN Program. Researchers aim to assess the future impacts of climate change, particularly, to water-related disasters (e.g., storm and flood), by analysing historical and current data through climate downscaling techniques and applications. Additionally, social trends and technological innovation information are also analysed to update policy. Through a webinar series on Climate Change Projection for DRR, ADRC shares the products of the study to improve climate change literacy among DRR practitioners, researchers, and engineers as well as inform policy updates. In FY2024, webinars were co-organized with Cambodia and Malaysia.

(1) Webinar on Climate Change Impact Projection for DRR with Cambodia

The webinar with Cambodia was organized on 19 August 2024. During their presentation, Dr Hak Mao (Director, Department of Climate Change) and Mr Sem Savuth (Vice Chief, Climate Change Information Management, Department of Climate Change) reported that 44% of all communes in Cambodia are vulnerable to the increasing frequency and intensity of flood, drought, and storm due to climate change. By 2050, when sea-level rise is projected to reach 1,302 mm, about 242 km² of coastal areas in Cambodia will be inundated, resulting to an estimated economic loss of USD304 million. If the government does not offer additional action to combat the impacts of climate change, the planned GDP for 2050 will be 10% lower.

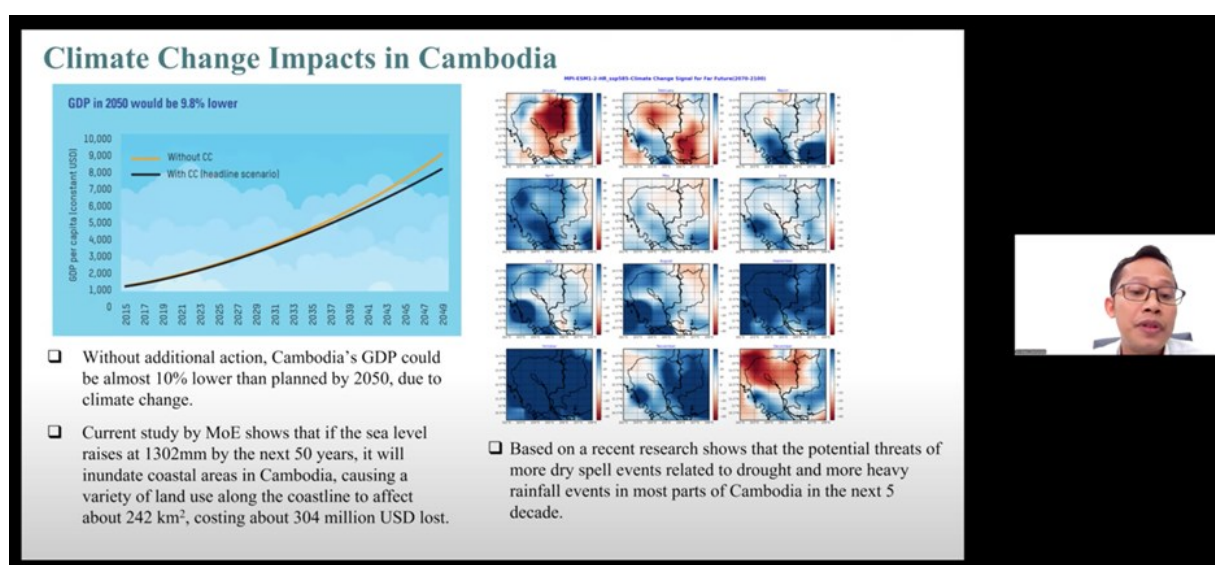


Figure 5.1 Presentation by Mr Sem Savuth, Department of Climate Change, Cambodia

Among the climate change countermeasures in Cambodia are aimed at: 1) increasing the current 62% usage of renewable energy to 70% by 2030; 2) ensuring that 70% of motorcycles and 40% of cars are EVs by 2050; and 3) planting of one million trees annually until 2050 to achieve 60% forest cover. The main challenge, however, is that these are broad actions that don't project specific impacts caused by climate-related disasters, such as extreme flood or storm. In order to do this, downscaled climate data is essential. Currently, historical climate data in Cambodia is sparse. This problem is compounded by limited tools and technologies within the government to measure the impacts or to make accurate projections of climate change.

In view of these concerns, other panellists introduced some of the initiatives and tools for climate change projection that may complement the ongoing climate actions in Cambodia. Prof. MORI Nobuhito (Research Division of Atmospheric and Hydrospheric Disasters, Disaster Prevention Research Institute, Kyoto University) introduced the SENTAN Program, and the potential collaboration with Cambodia, for assessing the effects of extreme water-related events and analysing the changes of hazards with rising global surface temperature as downscaled to countries in the Asia-Pacific region. Dr NAKAEGAWA Toshiyuki (Head of Second Laboratory, Department of Applied Meteorology Research, Meteorological Research Institute of Japan Meteorological Agency) introduced tools using high-resolution models and supercomputers to project a future climate at the local level. Dr MURATA Akihiko (Head of First Laboratory, Department of Applied Meteorology Research, Meteorological Research Institute of Japan Meteorological Agency) introduced tools and methods for dynamical downscaling to simulate localised climate change. Mr MORI Noriyuki (Deputy Director, International Center for Water Hazard and Risk Management) introduced a comprehensive platform on water resilience and disasters that includes data-integration for hazard, damage, and socioeconomic factors. On this platform, various agencies provide their respective climate data for integration in order to effectively forecast the impacts and provide early warning to communities-at-risk. In his closing remarks, Prof. TACHIKAWA Yasuto (Hydrology and Water Resources Research Laboratory, Kyoto University) emphasized the potential contributions of SENTAN Program (e.g., tools, technologies, and datasets) to the climate change countermeasures that Cambodia is undertaking.

(2) Webinar on Climate Change Projection for DRR with Malaysia

This webinar was held on 27 February 2025. In his presentation Dato' Ir Mohd Zaki bin Mat Amin (Director General, National Water Research Institute Malaysia) reported that by 2100, climate change in Malaysia is projected with increase in the following: 1) annual surface temperature between 1.85°C–2.08°C, 2) annual rainfall between 14%–25%, and 3) sea level between 0.71m–0.74m. These figures imply that if Malaysia does nothing to mitigate climate change, its regions will experience more occurrences of drying rivers (e.g., Bukit Merah in February 2022), pluvial flooding (e.g., Selangor, December 2022), and fluvial flooding (e.g., Batu Pahat, August 2021).

In view of this projection, other speakers from Malaysia shared information on some ongoing initiatives. Mr Ambun Dindang (Deputy Director General, Malaysian Meteorological Department) said that his department considered climate change projection data in monitoring and forecasting severe weather due to monsoon surges. Ms Lavanya Rama Iyer (Director of Policy and Climate Change, WWF-Malaysia) said that the World-Wide Fund for Nature in Malaysia has integrated climate resilience and governance into their programmes. Gs. Dr Norfashareena binti Muhamad (Head, Southeast Asia Disaster Prevention Research Initiative) said that their disaster databases integrated climate change data and made it available for local scale application.

Furthermore, Dato' Ir Mohd Zaki bin Mat Amin said that the Government of Malaysia expects to release two relevant documents in 2025—the Climate Change Act of Malaysia and the Malaysia National Adaptation Plan (MyNAP).

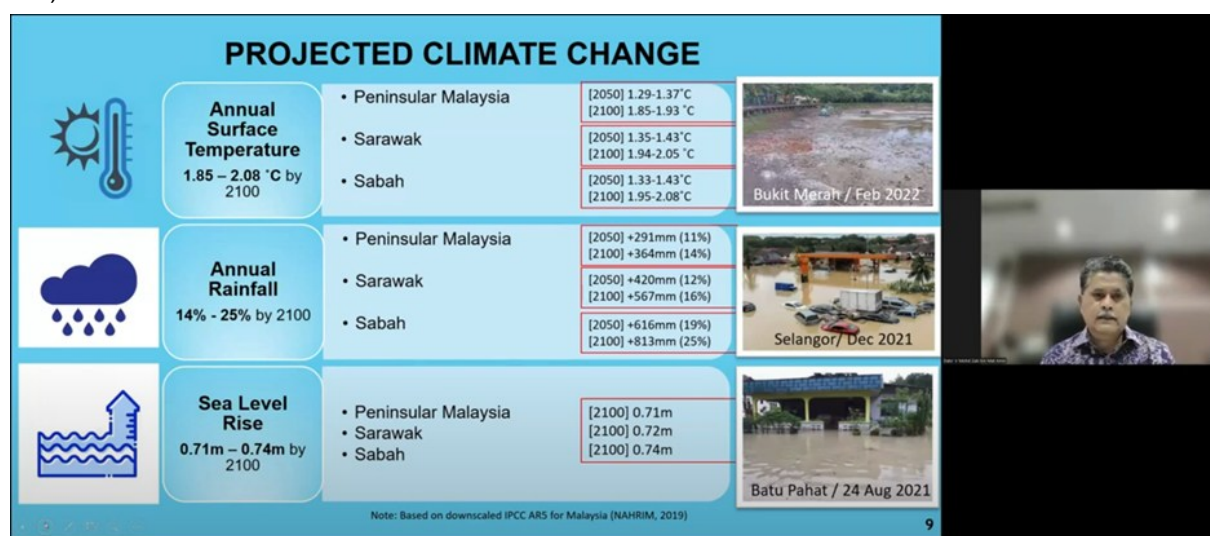


Figure 5.2 Dato' Zaki Amin presenting the projected climate change in the regions of Malaysia

Members of Area Theme 4 of the SENTAN Program also spoke in the webinar to explain the project, the technologies and tools, and the studies on climate change projections. The speakers included Prof. MORI Nobuhito of Kyoto University, Dr NAKAEGAWA Toshiyuki of Japan Meteorological Agency, Dr MURATA Akihiko of Japan Meteorological Agency, Mr MORI Noriyuki of International Center for Water Hazard and Risk Management, and Prof. TACHIKAWA Yasuto of Kyoto University. Dr IKEDA Makoto and Dr Gerald Potutan, both from ADRC, co-facilitated the event.

5.1.2 Joint Development of Citizen Empowerment Program for DRR in Asia

On 7 September 2024, ADRC served as a supporting organization for the implementation of the project, “Joint Development of Citizen Empowerment Program for Disaster Risk Reduction in Asia” organized by the Kansai University of International Studies (KUIS) in Yogyakarta, Indonesia. This project utilized ICT in conducting community-based disaster management drill.

The drill targeted the Jogoyudan community along the Code River in Yogyakarta City, which is vulnerable to flooding and cold lava flows from volcanic ash. In this drill, KUIS and the local University of Atma Jaya Yogyakarta (UAJY) coordinated with the provincial/municipal disaster management agency (BPBD) and the community. Students from KUIS and UAJY actively participated in the drill activities by utilizing a community disaster information sharing system ([geoBingAn](#) + WhatsApp system) promoted by ADRC. This system enables simultaneous broadcasting to registered WhatsApp users and facilitating two-way information exchange. This system effectively collects information in the form of text, photos, and videos among registered members of the WhatsApp group. As observed during the evacuation drills, the utilization of ICT tools contributed in effective evacuation of people with injuries, pregnant women, and persons with disability.



Figure 5.3 Community evacuation drills utilizing WhatsApp-based ICT tool in Yogyakarta, Indonesia

The BPBD and the community members found this system convenient and user-friendly platform for information sharing, as they were already familiar with using WhatsApp. Even after the drill, BPBD asked some questions about future collaboration and expressed interest in continuing to use this system.

5.1.3 Mt. Fuji Disaster Drill Project

The Mt. Fuji Disaster Drill Project also utilizes ICT-based technology, particularly geoBingAn + LINE or WhatsApp systems (Figure 5.4).

Mt Fuji Report

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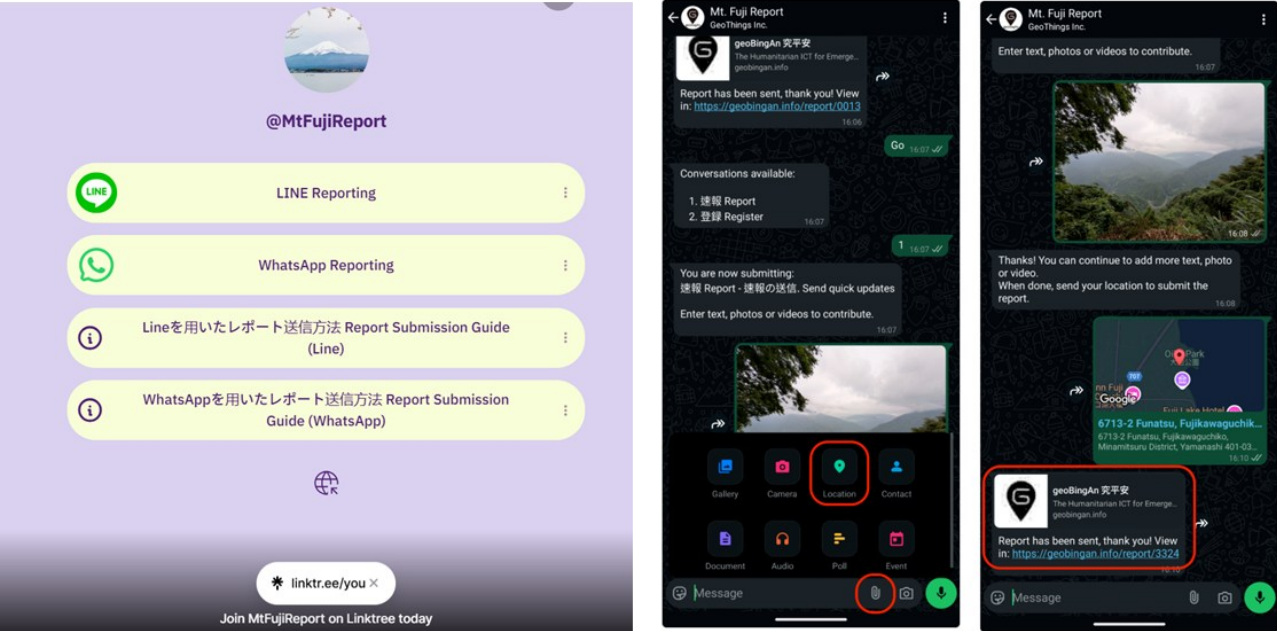


Figure 5.4 Utilizing WhatsApp or LINE systems with geoBingAn in Mt. Fuji Disaster Drill

In FY2024, ADRC collaborated with [GeoThings](#) in conducting a comprehensive disaster drill simulating a volcanic eruption in the Mt. Fuji area. A technological tool called “[geoBingAn](#)”, showcased its utility in disaster data collection and information sharing, providing robust support for the smooth execution of the exercise. The

drill simulated volcanic eruption and pyroclastic flow scenarios near the 5th Station of Mt. Fuji, involving around 200 personnel from relevant organizations, including the Fujikawaguchiko Town Government, Yamanashi Prefecture Government, police, and fire departments. During the drill, geoBingAn demonstrated its core functions in data integration and visualization. Participants used the LINE application to quickly upload photos, videos, and other disaster-related information from the field. geoBingAn instantly consolidated this data and integrated volcanic eruption warnings from meteorological agencies to produce intuitive visual outputs. The platform's real-time disaster distribution maps and evacuation route suggestions enabled decision-makers to quickly grasp the overall situation and formulate effective response strategies. This approach not only reduced learning costs but also significantly improved the speed and accuracy of information transmission.

In this drill, the platform incorporated multilingual support for foreign tourists, ensuring users of different languages could promptly understand evacuation information. This enhanced the comprehensiveness and practicality of the drill. Throughout the exercise, geoBingAn's outstanding features provided participating organizations with real-time and accurate disaster information, validating its potential in complex disaster scenarios. Mr KAJIWARA Toshiaki, a section chief from the Fujiyoshida Police Station, commented that the drill effectively demonstrated the practicality of advanced technologies, including geoBingAn, and plans to further integrate such tools into future disaster responses.

5.1.4 SATREPS Earthquake Early Warning and Response System Feasibility Study and Preparatory Period in FY2024

In FY2024, ADRC participated in the feasibility study and preparatory period for the project entitled "Development of End-to-End Earthquake Early Warning and Response System (EEWRS)" provisionally accepted as one out of ten new projects for the Science and Technology Research partnership for Sustainable Development (SATREPS) funded by Japan Science and Technology Agency (JST) and Japan International Cooperation Agency (JICA).

The feasibility study (FS) and preparatory period include a one-week mission to Indonesia on 26–31 August 2024. During this period, ADRC had three days of intensive technical sessions at BRIN and BMKG respectively to discuss and deliberate the project design with the Indonesian counterparts. The team also had a courtesy meeting with the BRIN's Deputy Minister, BMKG's Deputy Minister, BNPB's Deputy Minister for Disaster Management and Strategy, and the Deputy Minister of Ministry of Information and Communication. As part of the mission, the ADRC also visited the Headquarter of Jakarta Special Region Disaster Management Agency (BPBD) that house its Emergency Operations Center and public disaster education center, which mirror Japan's life-safety learning center. The mission also visited High School #57 in Jakarta as well as the residential areas in Western part of Jakarta to understand the housing structural conditions and public awareness towards the potential application of an earthquake early warning system. The ADRC also facilitated visit to three industrial estates in the Greater Jakarta area to identify the potential industrial users of an EEWRS. The three industrial estates are all developed by Japanese business groups and also housing major Japanese companies in Indonesia whereby their application of EEWRS in Japan may ease quicker adoption of the system to protect their businesses in Indonesia. At the end of the mission, a Minute-of-Meeting (M/M) document and Project Design Matrix (PDM) final draft were developed and agreed by researchers from both Japan and Indonesian sides.

Between September 2024 and January 2025, ADRC team attended three technical meetings at JST and JICA offices in Tokyo for finalization of the SATREPS project. Finally, the Record of Discussions for the SATREPS was officially signed by representatives of Government of the Republic of Indonesia and Government of Japan on February 2025 to officially mark the start of the project from Japanese Fiscal Year 2025 to 2029.



Figure 5.5 Clockwise from upper left: opening, technical session, visit to BPBD, and visit to residential area in Jakarta

5.2 International Engagements and Partnerships

In FY2024, ADRC co-organized and/or engaged in many events, including those with APEC-EPWG, Sentinel Asia, UNDRR, ESCAP/WMO, ASEAN, and other networks and partnerships.

5.2.1 APEC-EPWG

Under the auspices of the Cabinet Office of Japan, ADRC participates in the APEC Emergency Preparedness Working Group (EPWG). It seeks to build capacity in the region so that APEC member economies can better mitigate, prepare for, respond to, and recover from emergencies and natural disasters. Among the usual activities that ADRC engages include building resilience of businesses and communities, fostering private-public partnerships to protect communities and businesses from disruption; and sharing information, knowledge and technology to improve regional capacity on disaster risk reduction. ADRC participated in a number of EPWG activities in fiscal year 2024.

(1) 17th Senior Disaster Management Officials Forum

EPWG organized the 17th session of the Senior Disaster Management Officials Forum (SDMOF-17) on 13 May 2024 at Cerro Juli Convention Center in Lima, Peru. It adopted the theme, “Emergency Preparedness for Sustainable Growth and Sound Development with an Inclusive and Community Approach”.

ADRC Project Director Mr SUZUKI Koji, who co-chaired the EPWG from 2020 to 2023, headed the Japan delegation and introduced the project “Public private partnership for decision making support system with AI technology” in one of the SDMOF’s sessions. At its core, this collaborative project advances the use of satellite big data and spatial artificial intelligence (AI) to model decision-making processes related to disaster risk reduction and management. In particular, Mr Suzuki highlighted the following features of the project: 1) integration of social factors in applying scientific innovations, e.g., remote sensing technology, AI data analysis science, and digital twinning; 2) modelling of decision criteria for decision-making based on scientific facts, including collaboration between public and private sectors in verifying test results; and 3) real-time understanding of damage situations based on big data analysis and research prediction.



Figure 5.6 17th Senior Disaster Management Officials Forum in Peru

Participants of the SDMOF gained greater insights on the importance of cooperation through public-private partnerships to improve responsiveness with a focus on interoperability of information systems for decision making. Mr Suzuki noted that the lead agency of this project is the Center for Environmental Remote Sensing of Chiba University with ADRC, Japan Aerospace Exploration Agency (JAXA), Nagoya Institute of Technology (NITech), Oriental Consultant Global (OCG), Weather News INC., and Aioi Nissay Dowa Insurance Co., Ltd as participating agencies. The project also partners with the Italian space agency, Centro Italiano Ricerche Aerospaziali (CIRA).

(2) EPWG Workshop on Strengthening Early Warning Early Action for the Vulnerable Communities in APEC

The EPWG Workshop on Strengthening Early Warning Early Action for the Vulnerable Communities in APEC took place in Da Nang, Viet Nam, on 24–25 June 2024. Thirty experts from the APEC region participated in the workshop that was aimed at sharing professional and technical information in natural disaster risk management.

The Viet Nam Disaster and Dyke Management Authority, Ministry of Agriculture and Rural Development organized the workshop. ADRC Research Director Ms KODAMA Miki and Senior Researcher Ms SHIOMI Yumi participated in the event. In Session 3 (Best Practices and Lessons Learned), Ms Shiomi made a presentation entitled “Utilization of State of Art Communication Technologies for CBDRM and Emergency Management”. Through the workshop, participants actively shared their lessons learned and views on Early Warning and Early Action for the vulnerable communities.



Figure 5.7 Group of the participants of EPWG Workshop in Viet Nam

(3) Online APEC Viet Nam Workshop

APEC Viet Nam organized an online workshop on “Improving the Resilience of Vulnerable Coastal Communities to Climate Change” on 24–25 July 2024. This workshop comprised four thematic sessions, and ADRC moderated Session 1 on the topic Resilience of Vulnerable Coastal Communities to Climate Change in the Asia-Pacific: Prospects and Challenges. This session featured five speakers. The two speakers from Viet Nam reported the climate-related challenges at the national and local levels respectively, such as sea-level rise that caused intense typhoons and frequent flooding. Other speakers presented the prospects of addressing climate-related challenges: 1) UNDRR reported that the Sendai Framework for Disaster Risk Reduction provides guidance for integrating climate change adaptation and disaster risk reduction measures; 2) Republic of Korea reported that new tools are now available to monitor and predict storm surges; and 3) Australia reported its leadership in promoting strategic partnerships for coastal resilience in the Asia-Pacific region.

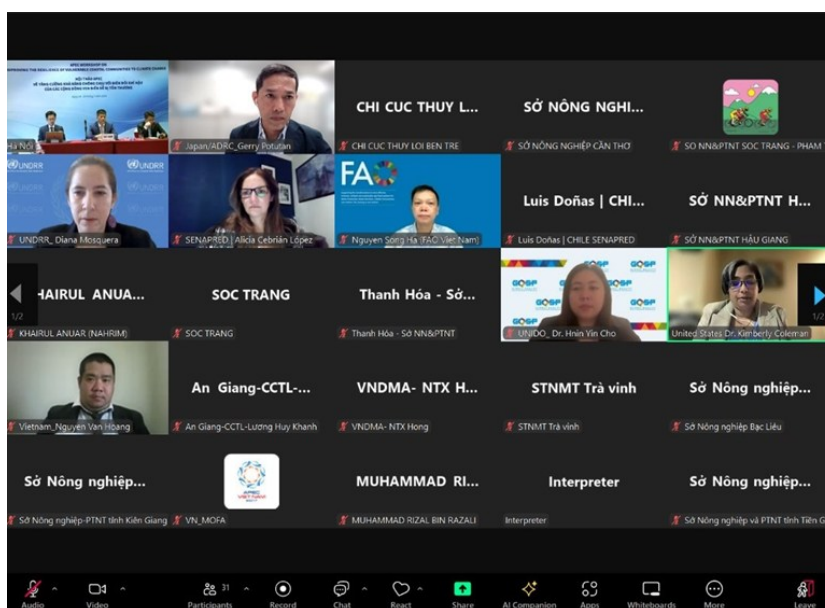


Figure 5.8 Participants of APEC Viet Nam Online Workshop

In Session 2 (topic: Scaling up efforts on strengthening resilience of vulnerable coastal communities to climate change), Mr Gerald Potutan (Senior Researcher, ADRC) made a presentation about “Utilizing climate change impact projection data to strengthen the resilience of coastal communities”. ADRC, along with a number of research institutes and agencies, introduced its engagement in the Advanced Studies of Climate Projection (SENTAN) in developing integrated hazard models on storm-and-flood hazards for the Asia-Pacific region. Mr Potutan highlighted the utilization of downscaling tools to produce localized climate projection data to inform

adaptation and mitigation measures. ADRC's participation in this workshop provided an opportunity to learn from other economies' experiences and actions in addressing climate-related challenges at the local level.

5.2.2 APRSAF/Sentinel Asia

Under the framework of the Sentinel Asia, an initiative led by the Asia Pacific Regional Space Agency Forum (APRSAF) to support disaster management with Web-GIS technology and earth observation satellite data, ADRC functions as the focal point to receive emergency observation requests (EORs) as well as participate in related activities.

(1) Update on the UN-SPIDER RSO Meeting

On 10 June 2024, an online meeting was held for the United Nations Platform for Space-Based Information for Disaster Management and Emergency Response (UN-SPIDER) Regional Support Office (RSO). UN-SPIDER is a multilateral platform promoted by the United Nations Office for Outer Space Affairs (UNOOSA) to facilitate the use of space-based technologies in disaster risk reduction and emergency response. UNOOSA is the UN agency responsible for space-related policies, and is headquartered in Vienna, Austria.

At meeting, ADRC Project Director SUZUKI Koji presented the progress of a project for use of the Quasi-Zenith Satellite System (QZSS) in disaster risk reduction. QZSS is a system that the National Space Policy Secretariat, Cabinet Office of Japan, is deploying in cooperation with nine countries in the Asia-Pacific region. The QZSS (known as Michibiki in Japan) is a Global Navigation Satellite System (GNSS) developed and operated by the Japanese government to transmit disaster-related information. This advanced technology can provide disaster-related information even in areas where regular communication infrastructure is lacking or is disrupted due to disaster. In Japan, partial operation began in 2018. The feasibility for general implementation of the technology in the Asia-Pacific region is being evaluated through surveys and by taking prototype receivers to the region to conduct demonstrations.

(2) 9th Joint Project Team Meeting

The 9th Joint Project Team Meeting was held from 5 to 7 November 2024 in Quezon City, Philippines. It was co-organized by the Philippine Space Agency (PhilSA) and JAXA.

ADRC participated in a training session held on 6 November, reporting on the status of Sentinel Asia's EOR and end-user feedback on the various data provided. ADRC also introduced the Standard Operation Procedures (SOP) being developed in each Sentinel Asia member country and activities of the related workshops in each country.



Figure 5.9 Dr IKEDA Makoto making a presentation at the 9th Joint Project Team Meeting

(3) 24th Steering Committee Meeting

ADRC attended the meeting for the 24th Sentinel Asia Steering Committee held at IWMI (International Water Management Institute) in Sri Lanka, on 12–13 December 2024. Also attending the meeting were JAXA, which served as the secretariat of the Sentinel Asia Joint Project Team, other space agencies in Asia, and organizations that deal with image analysis.

JAXA started the meeting by sharing the current status of Sentinel Asia operations and issues. In line with the Sentinel Asia Strategic Plan, the

organizations in charge of each category reported on their progress, and participants discussed issues and potential improvements. In addition, the space agencies and organizations dealing with image analysis shared their current activities, knowledge, and technologies. ADRC reported on the progress of its category of the Sentinel Strategic Action Plan (Step-3 Activities, and communication, collaboration, and cooperation), including the results of the workshops and interviews held in Nepal, Türkiye, and Kyrgyz Republic. ADRC also reported the status of collaboration with the UNDRR and other organizations.



Figure 5.10 Group Photo of the 24th Steering Committee Meeting of Sentinel Asia

(4) Sentinel Asia Workshop in Kyrgyz Republic

In line with Sentinel Asia's objective to promote international cooperation in monitoring natural disasters in the Asia-Pacific region, ADRC collaborates in conducting workshops introducing earth observation satellites and other space technologies to collect disaster-related information, and shares it over the internet. The aim is to mitigate and prevent damage caused by natural disasters such as typhoons, floods, earthquakes, tsunamis, volcano eruptions and wildfires. One of the workshops on utilization of satellites' systems for disaster risk reduction was conducted in Kyrgyz Republic in October 2024.



Figure 5.11 Sentinel Asia Workshop in Kyrgyz Republic, October 2024

(5) Sentinel Asia Workshop in Fiji

Following an EOR from The Pacific Community (SPC) on the impact of Vanuatu Earthquake on 17 December 2024, ADRC facilitated the sharing of the satellite images of disaster impacted areas from Sentinel Asia. Additionally, ADRC provided analysed maps and issued GLIDE number.

Since many of officers at National Disaster Risk Management Office (NDRMO) and SPC's Fiji office require capacity building in the use of satellite-based data for disaster management, ADRC visited Fiji in January 2025 to conduct interviews and to co-organize the Sentinel Asia Workshop.

SA Workshop in Fiji (2025)



Figure 5.12 Sentinel Asia Workshop in Fiji, January 2025

5.2.3 UNDRR/APP-DRR

ADRC engages with the Asia Pacific Partnership for Disaster Risk Reduction (APP-DRR) to support the implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030, particularly the Asia Regional Plan. In FY2024, ADRC participated in many activities of UNDRR/APP-DRR.

(1) TCS-UNDRR Inter-Regional Dialogue 2024

The Inter-Regional Dialogue 2024, with the theme “Tools and Technologies for Multi-Hazard Risk Assessment and Early Warning: Sharing Experience among Countries in the Asia Pacific Region”, was held on 27–29 May 2024 in Incheon, Republic of Korea. This event was jointly organized by the Trilateral Cooperation Secretariat (TCS) and the United Nations Office for Disaster Risk Reduction Office for Northeast Asia & Global Education and Training Institute (UNDRR ONEA & GETI) in support of the Early Warnings for All (EW4All) initiative, which the UN Secretary-General launched in 2022 to ensure a universal coverage of early warning systems by 2027.



Figure 5.13 Dr Gerald Potutan of ADRC made a presentation on QZSS DC Report

In this dialogue, participants from the trilateral cooperating countries China, Japan, and Korea (CJK) shared their respective experiences, tools, and technologies on multi-hazard early warning systems (MHEWS) with other countries in Asia-Pacific region, including Cambodia, Indonesia, Lao PDR, Malaysia, Philippines, Singapore, Thailand, Timor-Leste, and Viet Nam as well as Bangladesh, Bhutan, India, Maldives, Mongolia, Nepal, Pakistan, Sri Lanka, and Kazakhstan. The common MHEWS issues in these countries are: 1) warning information is not targeted to specific communities-at-risk; 2) warning information dissemination is usually one-way communication, and there is no feedback on whether the communities-at-risk have successfully evacuated; and 3) different warning agencies maintain their own databases that need to be integrated to achieve reliable forecast and warning.

Japan made two presentations at the plenary. One concerned the “QZSS DC Report”, an early warning message dissemination service of Japan using the “Michibiki” satellites system known as QZSS, presented by Dr Gerald Potutan, Senior Researcher at ADRC. The other concerned the “Nankai Trough Earthquake Warning Information” delivered by Mr UMETSU Togo, Policy Office International Cooperation Division, Disaster Management Bureau, Cabinet Office, Government of Japan.

This inter-regional dialogue facilitated greater regional collaboration in terms of: 1) available MHEWS tools and technologies; 2) effective practices for risk reduction among disaster-prone countries in relation to early warning; and 3) community-level capacity development in disaster risk reduction between Northeast Asia and other sub-regions of the Asia-Pacific region.

(2) Asia-Pacific Ministerial Conference on Disaster Risk Reduction

In the partner event that ADRC co-organized with JICA, JAXA, and other regional and local partners at the Asia-Pacific Ministerial Conference on Disaster Risk Reduction (APMCDRR), 14–18 October 2024 in Manila, Philippines, Dr Gerald Potutan, Senior Researcher at ADRC, highlighted the contributions of QZSS (also known as “Japanese GPS”) in improving early warning systems. Firstly, QZSS can transmit early warning message to mountainous and island areas that have limited access to Wi-Fi, internet, or cellular networks, thereby augmenting their early warning systems. Secondly, QZSS can serve as a back-up system for transmitting warning messages to communities-at-risk when ground telecommunication systems are damaged in a disaster. Since QZSS is also a positioning satellite system, warning messages can be transmitted specifically to disaster-affected communities.

ADRC also exhibited posters showcasing its activities on: 1) promoting satellite observation and messaging services for disaster risk management, 2) utilizing Information and Communications Technology for Community Based Disaster Risk Management (ICT for CBDRM), and 3) implementing capacity building programmes for comprehensive disaster risk reduction.

On the last day of the conference, ADRC representatives joined a field visit to Marikina City and Pasig City to learn more about the JICA project “Pasig-Marikina River Channel Improvement”, which includes river widening to further minimize the impact of flooding in Metro Manila.



Figure 5.14 ADRC served as panellist (left), ADRC Exhibit (right) during the APMCDRR in Manila

5.2.4 ESCAP/WMO: Typhoon Committee

Under the auspices of the Cabinet Office Japan, ADRC engages in ESCAP/WMO Typhoon Committee. In FY2024, ADRC participated a number of activities of the Typhoon Committee.

(1) 19th Meeting of the Working Group on Disaster Risk Reduction of the Typhoon Committee

The annual meeting of the Typhoon Committee (TC)'s Working Group on Disaster Risk Reduction (WGDRR) was held on 25–28 June 2024 in Seoul, Republic of Korea on the theme “EW4All: Bridging Gaps for Effective Disaster Risk Reduction”.

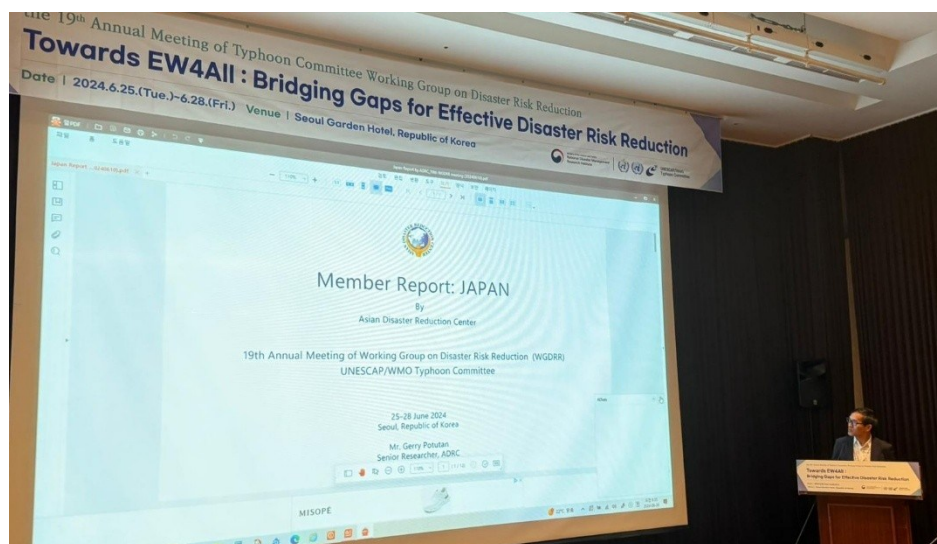


Figure 5.15 ADRC presented the Member Report of Japan at the 19th WGDRR Meeting

ADRC, on behalf of the Cabinet Office Japan, made the following contributions:

- 1) Presented Japan's member report highlighting the milestones on DRR activities implemented by ADRC in 2023 (e.g., GLIDE, Sentinel Asia, QZSS, training, webinars, Asian Conference on Disaster Reduction (ACDR), website, and other information-sharing activities)
- 2) Announced the host, theme, dates, and venue of the next ACDR2024 to the WGDRR members
- 3) Noted the key technical presentations related to the theme of ACDR2024, particularly the “Urban inundation response technology using deep learning and sensor data” by the National Disaster Management Research Institute (NDMI)/ Republic of Korea and the “Role of Impact-Based Forecasting in Early Warnings for All (EW4All) initiative” by United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)
- 4) Affirmed a continuing collaboration with WGDRR in information sharing through GLIDE, the website, and online databases to be reflected in the working group's Annual Operations Plans (AOPs)
- 5) Discussed with the participant from Viet Nam regarding ADRC's engagement in the forthcoming APEC Viet Nam Online Workshop on “Improving the Resilience of Vulnerable Coastal Communities to Climate Change”, 24–25 July 2024. The WGDRR is one of the working groups under the UNESCAP/ WMO Typhoon Committee, comprising 14 members (i.e., 12 countries and 2 regions) in Asia-Pacific region.

(2) ESCAP/WMO Typhoon Committee Attachment Training 2025

In line with the regularly activities of ESCAP/WMO Typhoon Committee, the Japan Meteorological Agency (JMA) organized a training to forecasters in Asia, 14–23 January 2025 at the Regional Specialized Meteorological Center (RSMC) Tokyo. Mr Gerald Potutan, Senior Researcher of ADRC, was invited to serve as lecturer. He

shared the DRR work of ADRC and discussed the activities related to promoting technology for early warning dissemination like QZSS DC Report and disaster data sharing like GLIDE number system. Most of the participants were from Typhoon Committee member organizations, who actively participated in lively discussions. After the lecture, the participant from Pakistan said that the presentation inspired him to be a "good forecaster", as he gained understanding of the linkage between his forecasting work to disaster risk reduction.



Figure 5.16 Attachment Training of Typhoon Committee at RSMC Tokyo

5.2.5 ASEAN

ADRC participated in the following ASEAN-related events during FY2024.

(1) 7th ASEAN Committee on Disaster Management (ACDM) + Japan Meeting

The 7th ASEAN Committee on Disaster Management (ACDM) + Japan Meeting was held on 9 May 2024 in Bandar Seri Begawan, Brunei Darussalam. As a part of the programme, Mr SASAHARA Akio, Executive Director of ADRC, gave presentations on the final outcome of two projects: "Promotion of Database Linkage and Capacity Enhancement through Utilization of GLIDE" and "Pilot Project on Utilization of State-of-the-Art Communication Technologies for CBDRM and Disaster Emergency Management", which were implemented to promote the "ASEAN-Japan Work Plan on Disaster Management 2021–2025".

Regarding the CBDRM activities, the delegates from Malaysia, the target country of the project, expressed their gratitude for its successful completion. Additionally, proposals for the intended next phase of these projects were explained. In the meeting, there were also reports on the progress of various activities of the ASEAN-Japan Disaster Risk Reduction Action Plan. Furthermore, ADRC participated in a field visit held on the last day, which facilitated interaction among the meeting participants.

As Brunei, the host country of the ACDM + Japan Meeting, officially became a member of ADRC on 1 May 2024, a meeting was held with the Director of Brunei's National Disaster Management Centre (NDMC) to discuss future cooperation activities. Meetings with representatives from Malaysia, the ASEAN Secretariat, and the AHA Centre were also organized.



Figure 5.17 ADRC Executive Director Sasahara at 7th ACDM + Japan Meeting (left), meeting the NDMC Brunei (right)

(2) Regional Workshop on Building Climate Smart ASEAN

On 4–6 September 2024, the Regional Workshop on Building Climate Smart ASEAN was held in Vientiane, Lao PDR, organized by the Economic Research Institute for ASEAN and East Asia (ERIA). Dr IKEDA Makoto, Senior Researcher at ADRC, participated in this workshop at the request of ERIA.

This regional workshop was aimed at equipping stakeholders with tools and knowledge necessary to build a climate-resilient ASEAN.

ADRC participated in Session 2 “From Vulnerability and Resilience: Planning Adaptation Strategies”. Dr Ikeda explained the effectiveness of investment in disaster prevention in advance as well as Japan’s regional disaster prevention plans and earthquake warning systems. In the panel discussion of the same session, ADRC was joined by Prof. YAMAJI Eiji of the University of Tokyo, and answered questions from participants (e.g., earthquake early warning systems).



Figure 5.18 Dr Ikeda with Prof. Yamaji at the panel discussion

(3) 8th ASEAN Committee on Disaster Management (ACDM) + Japan Meeting

From 21 to 25 October 2024, the 45th ASEAN Committee on Disaster Management (ACDM) Meeting, 12th ASEAN Ministerial Meeting on Disaster Management (AMMDM) Meeting, and other related meetings were held in Bandar Seri Begawan, Brunei Darussalam. The 8th Meeting of ACDM + Japan took place on 23 October, where ADRC gave presentations on the intended new activities of the projects “Promotion of Database Linkage and Capacity Enhancement through Utilization of GLIDE” and “Pilot Project on Utilization of State-of-the-Art Communication Technologies for CBDRM and Disaster Emergency Management”. During the meeting, reports were also made on the progress of various activities of the ASEAN-Japan Work Plan on Disaster Management 2021–2025.



Figure 5.19 ADRC Executive Director SASAHARA Akio at the 8th ACDM + Japan Meeting

5.2.6 Other International Engagements

Upon invitation of other organizations and partners, ADRC participated and shared information in a number of events in FY2024.

(1) Fourth Expert Forum for Producers and Users of Disaster-related Statistics and Associate Events

An Expert Forum for Producers and Users of Disaster-related Statistics is organized every year, by the United Nations in collaboration with its partners, to advance the production and use of disaster-related statistics for risk-informed development in support of the aim of the Inter-Agency and Expert Group on Disaster-related Statistics (IAEG-DRS) of the United Nations Statistical Commission. The Forum provides a platform where users and producers of disaster-related statistics collaborate and share knowledge. The Fourth Expert Forum for Producers and Users of Disaster-related Statistics took place in Addis Ababa, Ethiopia, in a hybrid format, back-to-back with the Ninth Session of the Statistical Commission for Africa (STATCOM-Africa) and Tenth Session of United Nations Global Geospatial Information Management for Africa (UN-GGIM Africa) from 28 October to 1 November 2024.

ADRC participated in these events, particularly in the discussions on effective communication of disaster statistics at both global and national levels and solutions for improving disaster data communication as well as on issues of capacity development and resources.



Figure 5.20 Opening Remarks by Mr Oliver Chinganya of the UN Economic Commission for Africa (ECA)

(2) Denizli AFAD Seminar

In recent years, a lot of DRR activities have been conducted between ADRC and Disaster and Emergency Management Presidency of Türkiye (AFAD), including international conferences and field survey missions. Dr IKEDA Makoto from ADRC attended the AFAD Seminar in Denizli, Türkiye as a speaker and made several presentations. He shared information about DRR structures in Japan and DRR efforts at the community and national level. Dr Fatma Canaslan Çomut reported on recent AFAD's DRR programmes such as an information sharing system. The participants also engaged actively in discussion with the two speakers, and the workshop proved to be a useful occasion for considering how to achieve better DRR in Türkiye going forward.



Figure 5.21 Poster on the Denizli AFAD Seminar

(3) Bosai Kokutai

On 20 October 2024, the ninth edition of the Bosai Kokutai (National Convention for the Promotion of Disaster Prevention) 2024 was held in Kumamoto City, Japan. With the participation of 404 exhibitors and more than 17,000 visitors, the event was the largest ever held. ADRC participated in the online session and gave a one-hour introduction of its activities under the title “Aiming to improve disaster preparedness in the Asian region”. Videos were streamed live on YouTube, and recorded videos were made available on demand outside of the online session. It was noted that self-help and mutual help was recognized internationally, and the Disaster Prevention Promotion Council, consisting of experts from various fields and levels of society, was established in Japan following the adoption of the Sendai Framework for Disaster Risk Reduction during the Third United Nations World Conference on Disaster Reduction (WCDRR) in March 2015.



Figure 5.22 Bosai Kokutai 2024 Flyer

(4) World Bosai Forum 2025

One of the activities to promote the Sendai Framework for Disaster Risk Reduction is the World Bosai Forum, organized biennially since 2017, bringing together all sectors—domestic and international, industry, government and academia to discuss DRR measures. The World Bosai Forum 2025, held on 7–9 March 2025, was focused on the concepts of “Increasing Disaster Risks Due to Global Warming and Climate Change” and “Future Prospects”.

ADRC had a booth at the place of EXPO in the Forum and introduced the ADRC’s efforts such as promotion of DRR in Asia in cooperation with various stakeholders, advancement of DRR measures using ICT (e.g., QZSS, a disaster risk information transmission system), and disaster information sharing via mobile phones using GIS and social media as ADRC conducted projects in Mt. Fuji and Malaysia. In addition, six VRs from member countries (India, Republic of Korea, Türkiye, Fiji, Malaysia and Maldives) introduced the disaster situation and disaster risk management systems of their countries.



Figure 5.23 ADRC Booth at the World Bosai Expo 2025

6. International Recovery Platform

6. International Recovery Platform

ADRC is among the founding members of the International Recovery Platform (IRP), and continues to support IRP's work, including co-hosting the IRP Secretariat with the UNDRR and the Hyogo Prefectural Government.

6.1 International Recovery Forum 2025

The International Recovery Forum 2025 concluded successfully in Kobe, Japan, on 28 January 2025. The event marked the 30th anniversary of the Great Hanshin-Awaji Earthquake. With the theme "Achieving Resilient Recovery in a Changing World: Reflecting on 30 Years Since the Great Hanshin-Awaji Earthquake", the Forum brought together 424 participants online and onsite from 56 countries, including disaster recovery experts, practitioners, and policymakers to reflect on three decades of recovery experiences and chart a path forward for strengthening recovery readiness globally.

Prof. KAWATA Yoshiaki opened the Forum with a keynote reflecting on Japan's evolving approach to disaster recovery and prevention. Drawing from decades of research and experience, he introduced the concept of "phase transition" as a metaphor for abrupt shifts in disaster impact, driven by population density and social dynamics. He warned that should a major event of the projected magnitude of the Nankai Trough Earthquake strike an unprepared population, there is a risk of societal collapse, emphasizing that creative recovery must continuously adapt to societal change and consider social cohesion and well-being as central indicators of success.

The first panel session brought together local leaders from communities affected by major earthquakes across Japan, sharing critical insights from their recovery experiences spanning three decades from the 1995 Great Hanshin-Awaji Earthquake to the 2024 Noto Peninsula Earthquake. A central theme was the role of local leadership in managing recovery, with speakers noting that while national policies provide overarching frameworks, municipal and prefectural governments play the most sustained role in rebuilding efforts.

The discussion addressed long-term recovery challenges, particularly housing reconstruction and the social impacts of displacement, emphasizing that physical rebuilding alone is insufficient. Economic revitalization, community cohesion, and support for vulnerable populations must also be prioritized. Japan's experience has shown that aging populations in disaster-affected areas face unique challenges in rebuilding their homes and livelihoods, and these require targeted policies that go beyond standard recovery programmes.

Speakers emphasized that Japan's recovery model has evolved over time to incorporate lessons from past disasters, increasingly recognizing the need for adaptive recovery strategies that consider changing demographic, economic, and technological conditions. This includes greater use of data and digital tools for damage assessment and resource allocation, as well as efforts to institutionalize learning from previous recovery efforts to prevent repetition of past mistakes. However, coordination remains a challenge, particularly in aligning



Figure 6.1 Panellists of Session 1: Learning from Japan's Recovery

funding mechanisms with actual needs on the ground, where rigid national policies and funding structures can create obstacles for locally driven recovery efforts.

The second session brought together panellists from Nepal, Indonesia, the Philippines and the Asian Disaster Preparedness Center (ADPC), offering insights into how different countries are preparing for disasters and overcoming persistent recovery challenges. While recovery experiences vary by country, common themes emerged—particularly around financial preparedness, governance structures, use of technology, and long-term resilience planning.

One focus of the discussion was the need for pre-arranged financial mechanisms to avoid reliance on slower-moving funds mobilized post-disaster. Indonesia's disaster pooling fund was presented as a model that allows for rapid access to recovery financing, reducing delays that often hinder post-disaster response. The Philippines' "Ready to Rebuild" programme was highlighted as a proactive approach that integrates hazard mapping with pre-disaster contingency financing and local government capacity building. Nepal's experience following the 2015 earthquake reinforced the importance of financial and governance mechanisms, as delays in mobilizing recovery funds had significant long-term consequences for affected communities.



Figure 6.2 Panellists of Session 2:
International Perspectives on Build Back Better

Speakers underscored the role of technology and data in improving recovery outcomes. Indonesia's use of GIS-based tools for post-disaster needs assessments and financial planning was cited as an example of how digital tools can enhance efficiency and transparency in reconstruction efforts. The Philippines' "Ready to Rebuild" programme incorporates the PlanSmart web application, an automated planning tool that enables local government units to systematically generate recovery plans using science-based information and standardized templates.

The session highlighted ongoing challenges of inter-agency coordination and challenges with bureaucratic fragmentation and lack of clarity over roles in recovery efforts. Nepal's experience showed that without clear coordination structures, even well-funded recovery efforts can face delays and duplication. A key takeaway was that recovery must be seen as a continuous process, with many recovery efforts focusing on infrastructure but failing to integrate long-term economic, social, and environmental resilience strategies. Countries that have institutionalized iterative learning—continuously refining policies based on past disasters—have made greater progress toward building back stronger.

6.2 The Development of Recovery Readiness Assessment Framework

UNDRR, under the umbrella of IRP and in partnership with the ADPC and the Center for Urban Disaster Risk Reduction and Resilience (CUDRR+R), developed the Recovery Readiness Assessment Framework. The development of the Framework represents an important step forward in equipping countries with a self-

assessment tool to capture their level of recovery readiness across four key dimensions: governance, finance, capacity, and knowledge.

As background, IRP was tasked with this work by the G20 Disaster Risk Reduction Working Group (DRRWG) to support member states in strengthening their preparedness for resilient recovery. The Framework development process included extensive consultation with partners and government representatives through regional consultations for Asia held in Manila in the Philippines, between 24 and 25 June 2024, and online for the Pacific on 15 August 2024. These consultations convened senior government representatives to identify priorities and explore opportunities for strengthening preparedness for resilient recovery, directly informing both the Framework development and the "Call to Action to Build Back Better by Investing in Recovery Readiness" launched at the Asia-Pacific Ministerial Conference on Disaster Risk Reduction.



Figure 6.3 Asian Regional Consultation

6.3 Understanding Risk Global Forum 2024

At Understanding Risk 2024 in Himeji in Japan held in June 2024, ADRC and the IRP jointly led a Focus Day session on "Building A Roadmap to Scale up Progress with Risk-Informed Recovery" that engaged recovery thought leaders and participants in developing practical strategies for recovery readiness. The session identified critical bottlenecks in the recovery process, including challenges communities face with envisioning longer-term goals for resilience and building back better, and the difficulty of balancing recovery speed with the need for safety and consensus building.



Figure 6.4 Panellists of IRP Session at Understanding Risk 2024

Discussions emphasized the need for pre-disaster recovery planning as an essential tool to mitigate post-disaster challenges. The session recommended developing integrating build back better principles into recovery plans, supported by legal frameworks to ensure inclusion of vulnerable populations. Participants called for enhanced capacity building for local and national government officials and underscored the importance of engaging communities in recovery planning before disasters strike.

6.4 Asia-Pacific Ministerial Conference on Disaster Risk Reduction

In October 2024, ADRC and the IRP organized the Asia Pacific Resilient Recovery Dialogue at the Asia-Pacific Ministerial Conference on Disaster Risk Reduction (APMCDRR) in Manila, the Philippines, convening Ministers and senior officials from across the region. This two-segment dialogue resulted in the adoption of the "Asia-Pacific Call to Action to Build Back Better by Investing in Recovery Readiness", a concrete commitment by regional governments to accelerate progress on Priority 4 of the Sendai Framework on DRR.



Figure 6.5 Resilient Recovery Dialogue at APMCDRR 2024

6.5 G20 Disaster Risk Reduction Working Group Contributions

The IRP contributed to the organization of the G20 DRRWG thematic session on "Inclusive and Resilient Recovery" in Brazil in July 2024, in which countries shared their expertise and experience with recovery financing and capacity building approaches. The G20 DRRWG subsequently requested the IRP and the knowledge partners to develop the Recovery Readiness Assessment Framework.

6.6 Knowledge Management and Global Resource Hub

IRP secretariat continued to maintain the largest online database of recovery resources on the internet, significantly expanding its reach during this period. Throughout 2024, the IRP secretariat expanded the online library to more than 2,200 recovery-related publications, tools, and guidelines.



Documents and publications 3 June 2025

Priority actions to enhance readiness for resilient recovery

The Priority Actions to Enhance Readiness for Resilient Recovery are designed to take joined action to enhance readiness for resilient recovery to build back better by taking the following concrete actions to build a more resilient future for all.

United Nations Office for Disaster Risk Reduction (UNDRR)



Documents and publications 30 May 2025

Global Rapid Post-Disaster Damage Estimation (GRADE) Report: Myanmar earthquake - March 28, 2025

This GRADE report presents a rapid estimate of the direct economic damage to physical assets (building and infrastructure) from the moment magnitude (Mw) 7.7 earthquake that struck central Myanmar on March 28, 2025.

World Bank, the



Documents and publications 15 April 2025

Rapid Post-Disaster Needs Assessment survey for media institutions

The Rapid Post-Disaster Needs Assessment (PDNA) Survey for Media Institutions provides a structured framework for assessing the impact of a disaster on a given media outlet.

United Nations Educational, Scientific and Cultural Organization - Headquarters

Figure 6.6 IRP Website as repository of knowledge on recovery

6.7 Bosai Kokutai and Sendai Bosai Mirai Forum

At the National Disaster Risk Reduction Festival ("Bosai Kokutai") in Kumamoto, Japan in October 2024, IRP secretariat showcased its activities and distributed IRP's knowledge products, including its recovery guidance notes, the IRP Herald, and various knowledge products to promote building back better concepts. The IRP secretariat also participated in the 2024 Sendai Bosai Mirai Forum, hosting an exhibition booth sharing its work with domestic and international attendees.



Figure 6.7 IRP knowledge products

7. Natural Disaster Databook 2024

7. Natural Disaster Databook 2024

ADRC publishes the Natural Disaster Databook annually to provide statistical and analytical overview of disaster data. For 2024, ADRC downloaded the datasets from the Emergency Event Database (EM-DAT) created on [2 June 2025](#) and utilized them for this analytical overview. This Databook provides an overview of the trends in occurrences, number of deaths, people affected, and economic losses by focusing on seven disaster types: drought, earthquake, extreme temperature, flood, storm, volcanic activity, and wildfire.

Basic analysis is presented by comparing the 2024 data with the 30-year average (1994–2023) data. General comparisons are provided for the following:

- Comparison of the natural disaster data of 2024 with the 30-year (1994–2023) average data
- Comparison of the climate-related disaster data of 2024 with the 30-year (1994–2023) average data

Note that this Databook only presents general trend data (i.e., occurrence, deaths, people affected, and economic losses). It does not present detailed disaggregated data, such as analysis by gender, location, or sector. In other words, this Databook will not tell you how many of the total deaths are male or female or how many of the houses destroyed are in the rural or urban areas. Instead, this Databook will simply show whether the trend in 2024 is increasing or decreasing compared to the 30-year average (1994–2023).

At the outset, three observations can be highlighted in this Databook. First, disaster occurrences have been increasing but the number of deaths and the number of people affected are decreasing. This trend is observed globally and in Asia. Second, there is an increasing trend of climate-related disasters both globally and in Asia. Third, while the amount of economic losses from disasters is increasing globally, there seems to be a decreasing trend in Asia.

Globally, the number of disaster occurrence in 2024 is higher (360 events) than the 30-year average (332 events), indicating an increasing trend. Also, as shown in Table 7.1, the numbers of deaths and people affected indicate a decreasing trend while the amounts of economic losses indicate an increasing trend.

Table 7.1 Trend of Natural Disasters (Global)

Global	30-Year Average (1994–2023)	2024	Trend
Occurrence	332	360	↑
Death	54,626	14,496	↓
People Affected	195.2M	163.4M	↓
Economic Losses	USD132.0B	USD241.6B	↑

If we look at Asia, it is notable that the economic losses from disasters showed a decreasing trend in 2024 (USD31.9 billion) than the 30-year average (USD55.8 billion). A decreasing trend in economic losses is a positive indication of effective disaster risk reduction efforts. However, this trend observed in Asia does not necessarily mean a definitive decrease, as there are no 2024 data on economic losses for three of the disaster types (i.e., extreme temperature, volcanic activity, and wildfire) covered in this analysis. This has led to a decreasing trend when we compared the 2024 data with the 30-year average (1993–2023) data. Also, it should be noted that there were huge disasters in 2023 (e.g., Türkiye-Syria earthquakes and South Asia flooding) that could have inflated the 30-year average of economic losses. Other trends, as shown in Table 7.2, the numbers

of deaths and people affected indicate a decreasing trend while the number of occurrences indicate an increasing trend.

Table 7.2 Trend of Natural Disasters (Asia)

Asia	30-Year Average (1994–2023)	2024	Trend
Occurrence	132	148	↑
Death	31,853	8,916	↓
People Affected	163.4M	109.7M	↓
Economic Losses	USD 55.8B	USD 31.9B	↓

Climate change is attributed to cause many hazards to become more intense and frequent. In 2024, wildfires, floods, and droughts impacted millions of people across the globe. Severe drought affected millions of people in Zambia, Malawi, and Zimbabwe. Droughts in the Amazon fueled record wildfires in Brazil and Bolivia. Record heatwaves were experienced in Japan, India, Pakistan, Mexico, and across Europe. Devastating floods were experienced across central and eastern Europe. Destructive storms (e.g., Hurricane Helene and Hurricane Milton) made landfall in the United States while super typhoon Yagi caused severe flooding and displacement in Southeast Asia.

Globally, the occurrence of climate-related disasters in 2024 is higher (340 events) than the 30-year average (301 events). As shown in Table 7.3, the number of people affected by climate-related disaster is decreasing while the amount of economic losses is increasing.

Table 7.3 Trend of Climate-Related Disasters (Global)

Global	30-Year Average (1994–2023)	2024	Trend
Occurrence	301	340	↑
People Affected	189.8M	162.7M	↓
Economic Losses	USD103.5B	USD223.4B	↑

In 2024, Asia experienced a wide spectrum of climate-related disasters, including extreme temperature, storms, flooding, and drought. As shown in Table 7.4, the occurrence of climate-related disasters in 2024 in Asia is higher (133 events) than the 30-year average (113 events). The data also indicates that the number of people affected and the economic losses are decreasing.

Table 7.4 Trend of Climate-Related Disasters (Asia)

Asia	30-Year Average (1994–2023)	2024	Trend
Occurrence	113	133	↑
People Affected	158.8M	108.8M	↓
Economic Losses	USD33.5B	USD13.9B	↓

7.1 Natural Disaster Data

In this section, we look at the trends (whether increasing or decreasing) of natural disaster data in terms of occurrence, death tolls, people affected, and economic losses. We compare the natural disaster data of 2024 with the 30-year average (1994–2023) data to examine the trends of only seven disaster types (i.e., drought, earthquake, extreme temperature, flood, storm, volcanic activity, and wildfire) at the global level and in Asia.

7.1.1 Global Disaster Data

Records from 1900 to 2024 indicate an increasing trend in global disaster occurrence with a noticeable leap that began in the 1960s (Figure 7.1). The end of 20th century (i.e., 2000) shows by far the highest number of disaster occurrence (871 events) since 1900. Year 2000 experienced widespread flooding in various locations of Mekong, Bangladesh, India, and Mozambique. Devastating earthquakes struck in Indonesia and El Salvador. There were destructive cyclones in South Asia, and eruption of Mayon Volcano in the Philippines.

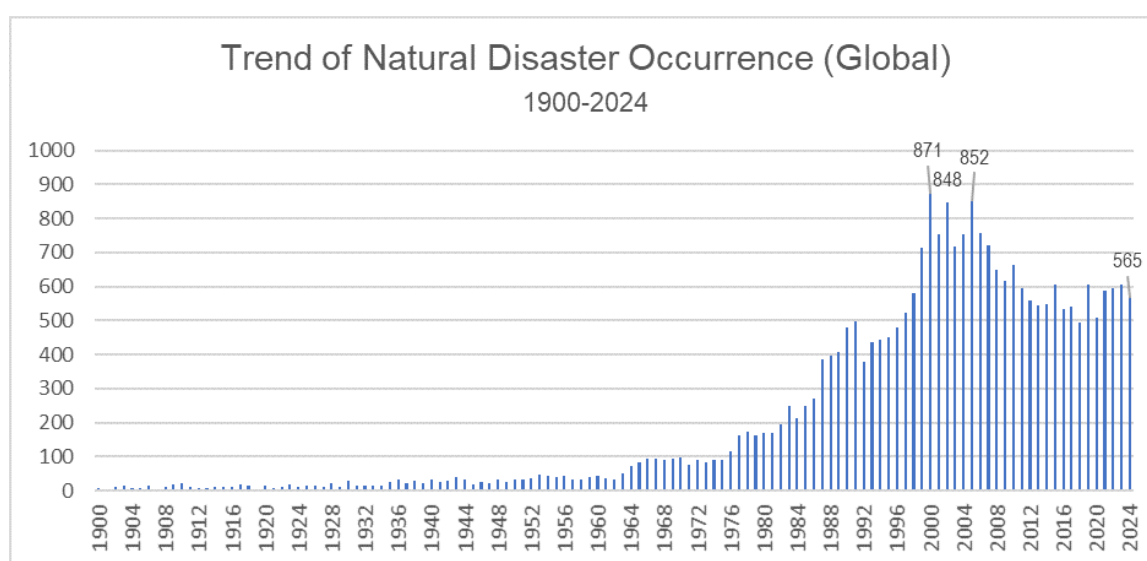


Figure 7.1 Global trend of natural disaster occurrence: 1900–2024 (EM-DAT/CRED, 2025)

Insights: Entering 21st century (i.e., 2001), the trend of disaster occurrences becomes significantly higher compared with the 20th century. This implies that the 21st century (defined by rapid economic development and accelerated by urbanization, globalization, and information technology) creates increasing conditions for disaster risks—such as high population density in hazard-prone areas, unsustainable practices that deplete natural resources, and inadequate building standards. It is therefore crucial to integrate disaster risk reduction (DRR) into development strategies.

(1) Occurrence (Global)

INCREASING TREND. As shown in Figure 7.2, disaster occurrence in 2024 is higher (360 events) compared with the 30-year average (332 events). Like in the previous years, most disasters in 2024 were triggered by storms (147 events) and floods (142 events).

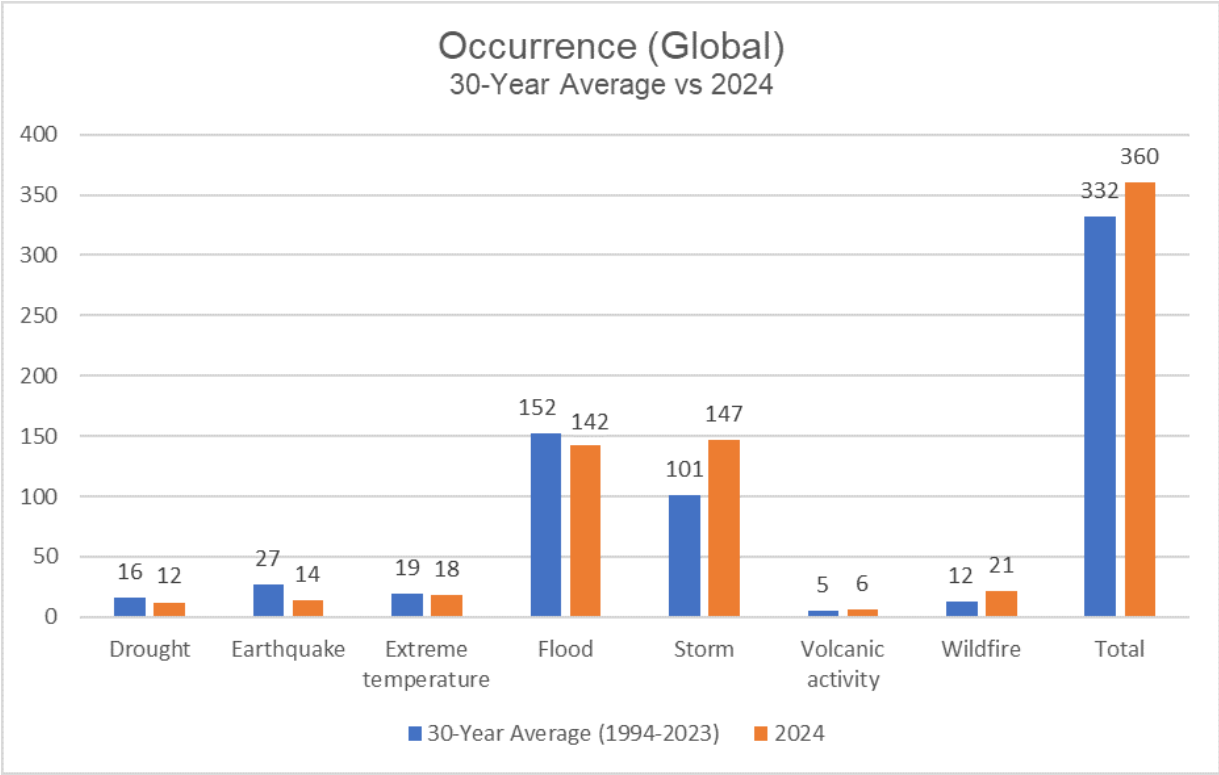


Figure 7.2 Number of occurrences by disaster type (globally): 30-Year Average vs 2024 (EM-DAT/CRED, 2025)

Looking at the data by disaster type, we can observe the following:

- Number of flood occurrences is lower in 2024 than the 30-year average.
- Number of storm occurrences is higher in 2024 than the 30-year average, indicating an increasing frequency.
- Number of wildfire occurrences has almost doubled in 2024 compared with the 30-year average

Insights: Floods and storms continue to trigger disasters in many parts of the world. Continuous improvement of disaster risk reduction efforts for these disaster types needs to be pursued relentlessly by governments and key stakeholders.

(2) Death (Global)

DECREASING TREND. As shown in Figure 7.3, the number of people killed by disasters in 2024 is lower (14,496 people) compared with the 30-year average (54,626 people). The disaster types that account for the highest number of deaths in 2024 are: flood (5,885 deaths), extreme temperature (5,247 deaths), and storms (2,582 deaths). Among the major incidents of flooding that caused high number of casualties in 2024 were in Niger, Spain, Afghanistan, Indonesia, India, and Myanmar.

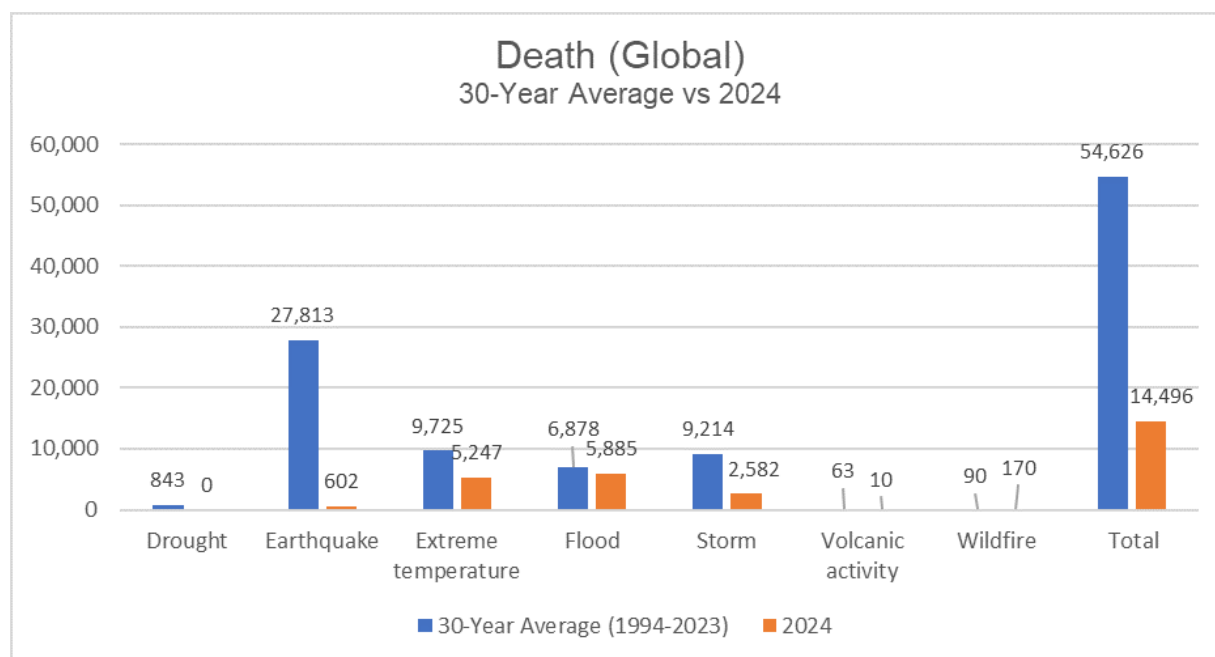


Figure 7.3 Number of people killed by disaster type (globally): 30-Year Average vs 2024 (EM-DAT/CRED, 2025)

Looking at the data by disaster type, we can observe the following:

- The number of deaths by disaster type has decreased in 2024 compared with the 30-year average, with the exception of deaths caused by wildfires.
- Although the occurrence of storms has increased in 2024, the number of deaths has decreased significantly. As observed, there were 2,582 deaths in 2024 compared with annual average of 9,214 deaths in the past 30 years (1994–2023).

Insights: There is a good reason to believe that disaster risk reduction efforts by governments and stakeholders (e.g., evacuation drills and flood control measures) have contributed to the decreasing number of deaths from floods and storms.

(3) People Affected (Global)

DECREASING TREND. As shown in Figure 7.4, the number of people affected by disasters in 2024 is lower (163.4 million people) compared with the 30-year average (195.2 million people). Floods accounts for the highest number of people affected. Among the large-scale typhoons that affected millions of people are super typhoon Yagi (largely affecting the communities in the Philippines, Viet Nam, Thailand, and Myanmar); Hurricane Helene that affected the states of Florida and North Carolina of the United States; and Hurricane Milton affecting over 3 million homes in Florida.

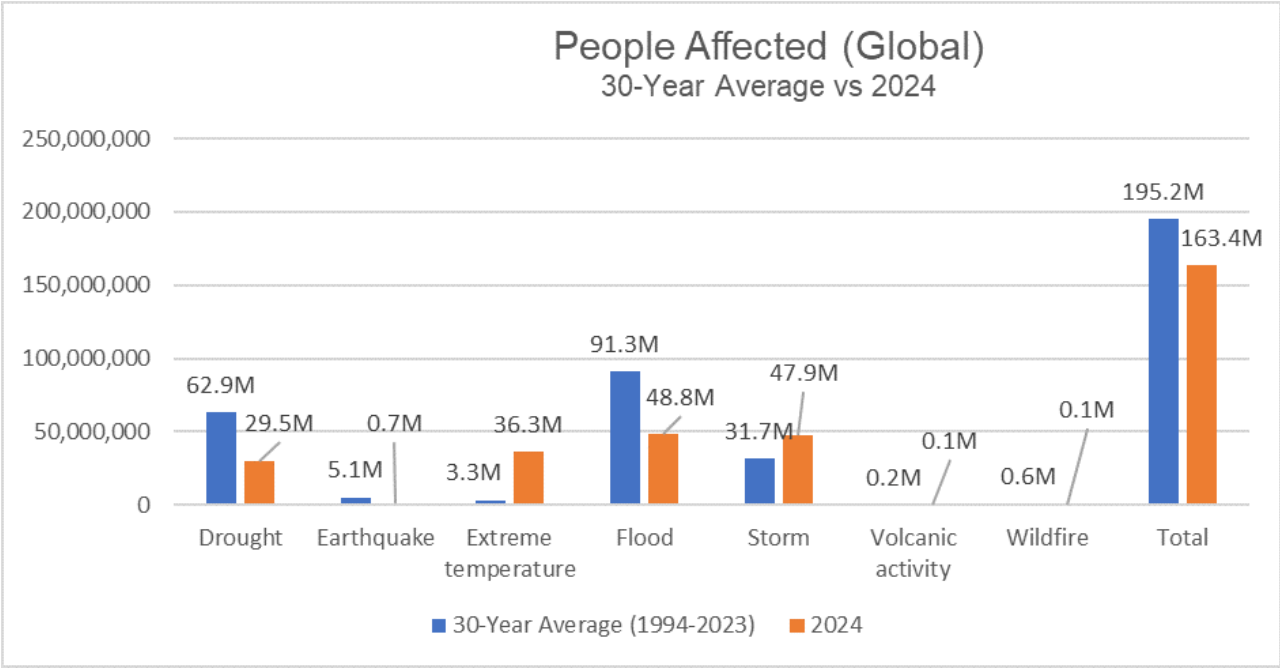


Figure 7.4 Number of people affected by disaster type (globally): 30-Year Average vs 2024 (EM-DAT/CRED, 2025)

Looking at the data by disaster type, we can observe the following:

- The number of people affected by floods is decreasing in 2024 compared with the 30-year average.
- Similarly, the number of people affected by drought, earthquake, volcanic activity, and wildfire are all decreasing in 2024 compared with the 30-year average.

Insights: In 2024, the number of people affected by extreme temperature is significantly higher compared with the 30-year average. This indicates that the countermeasures for extreme temperature need to be enhanced.

(4) Economic Losses (Global)

INCREASING TREND. As shown in Figure 7.5, the economic losses from disasters in 2024 is much higher (USD245 billion) compared with the 30-year average (USD132 billion). This increasing trend of economic losses could be attributed to a combination of multiple factors; increased frequency and intensity of extreme weather events, higher exposure of people and assets to these hazards, and more people living in vulnerable areas.

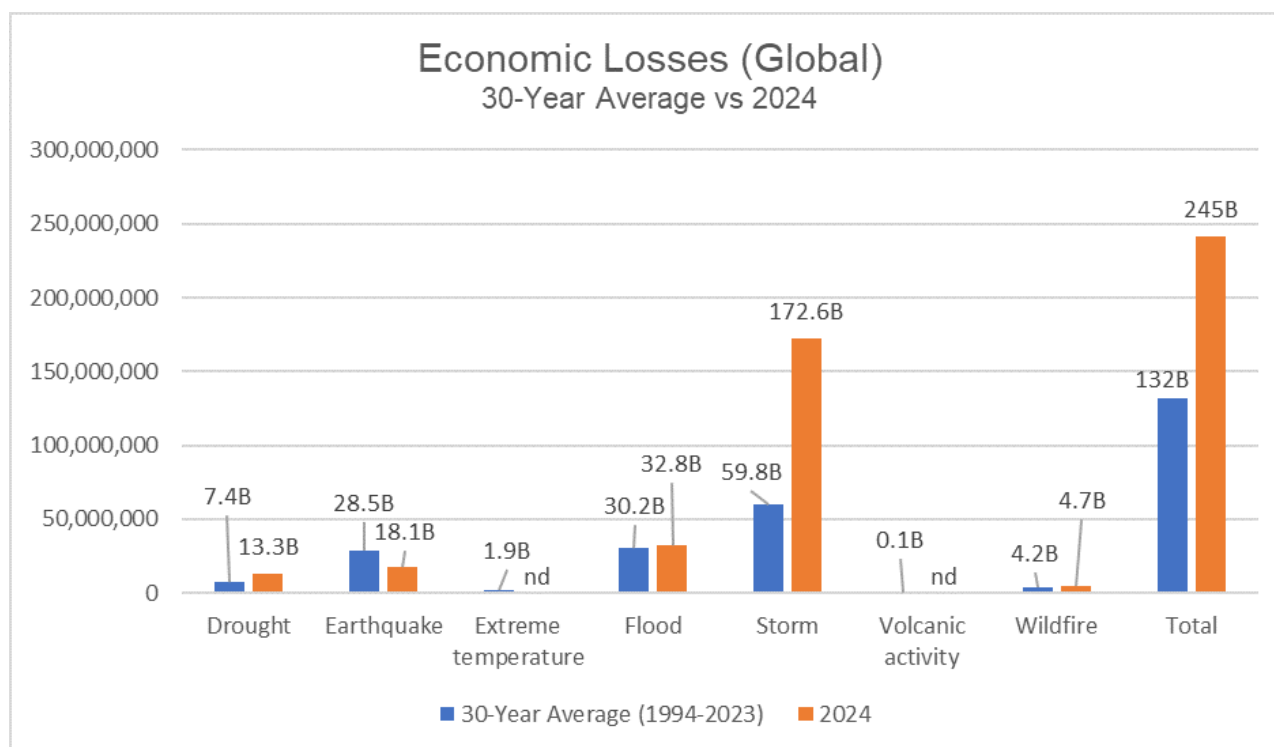


Figure 7.5 Economic losses by disaster type (globally): 30-Year Average vs 2024 (EM-DAT/CRED, 2025)

Looking at the data by disaster type, we can observe the following:

- Economic losses from storms are significantly higher (USD172.6 billion) in 2024 compared with the 30-year average (USD59.8 billion)—almost tripled.
- Economic losses from flood are also higher (USD32.8 billion) in 2024 compared with the 30-year average (USD30.2 billion).

Insights: The huge economic losses from storms and flood disasters imply that many people and assets are not only exposed to these risks, but are also vulnerable in terms of location and limitations of mitigation practices.

7.1.2 Asian Disaster Data

Similar to the global trend, disaster occurrence in Asia has been increasing during the period 1900–2024 (Figure 7.6). Year 2005 accounts for the highest number (382 events) of disaster occurrence in Asia since 1900. Among the most devastating natural disasters in 2005 were the magnitude 7.6 Kashmir earthquake on 8 October killing of 80,000 people, the magnitude 8.6 earthquake in Nias-Simeulue in March, and super typhoons and prolonged flooding in South and Southeast Asia. All together, these disasters killed tens of thousands and impacted millions of people in the region.

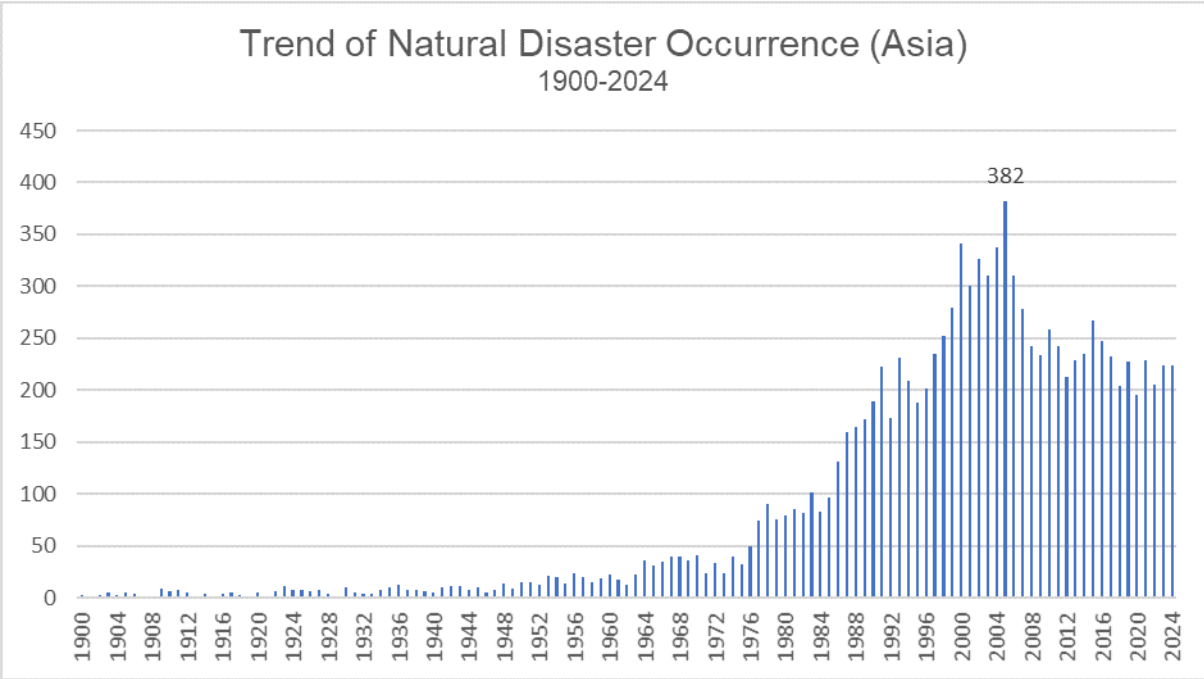


Figure 7.6 Asian trend of natural disaster occurrence: 1900–2024 (EM-DAT/CRED, 2025)

Insights: The devastating natural disasters in 2005 offered critical lessons for improving DRR, including: 1) the establishment of institutional structure and governance framework for disaster management; 2) improvement and enforcement of building codes for resilient infrastructure; and 3) enhancement of disaster preparedness and early warning systems. These were integrated in the Hyogo Framework for Action.

(1) Occurrence (Asia)

INCREASING TREND. As shown in Figure 7.7, disaster occurrence in 2024 in Asia is higher (148 events) compared with the 30-year average (132 events). Among the most devastating disasters in Asia in 2024 included super typhoon Yagi, a catastrophic landslide in Papua New Guinea, and severe flooding across South and Southeast Asia. Typhoon Yagi caused catastrophic flooding and landslides resulting in over 844 deaths across the region with Viet Nam as the hardest hit accounting for at least 300 deaths. Over 670 people killed and 1,680 residents displaced by the Papua New Guinea landslide. The flooding in South and Southeast Asia affected multiple countries. In India, it compounded with deadly landslides in Wayanad, Kerala, killing at least 392 people. In Indonesia, Malaysia, and Sri Lanka, the torrential rainfall caused dozens of deaths and extensive damage to infrastructure and crops. In Bangladesh, Nepal, and Pakistan, heavy flooding throughout the monsoon season killed hundreds, displaced thousands, and impacted millions of people. It should also be noted that on the New Year's Day of 2024, a magnitude 7.6 earthquake struck the Noto Peninsula in Japan. Reportedly, 634 people were killed, including deaths occurring in evacuation centers. The earthquake also caused a tsunami and landslides, destroying nearly 6,532 houses.

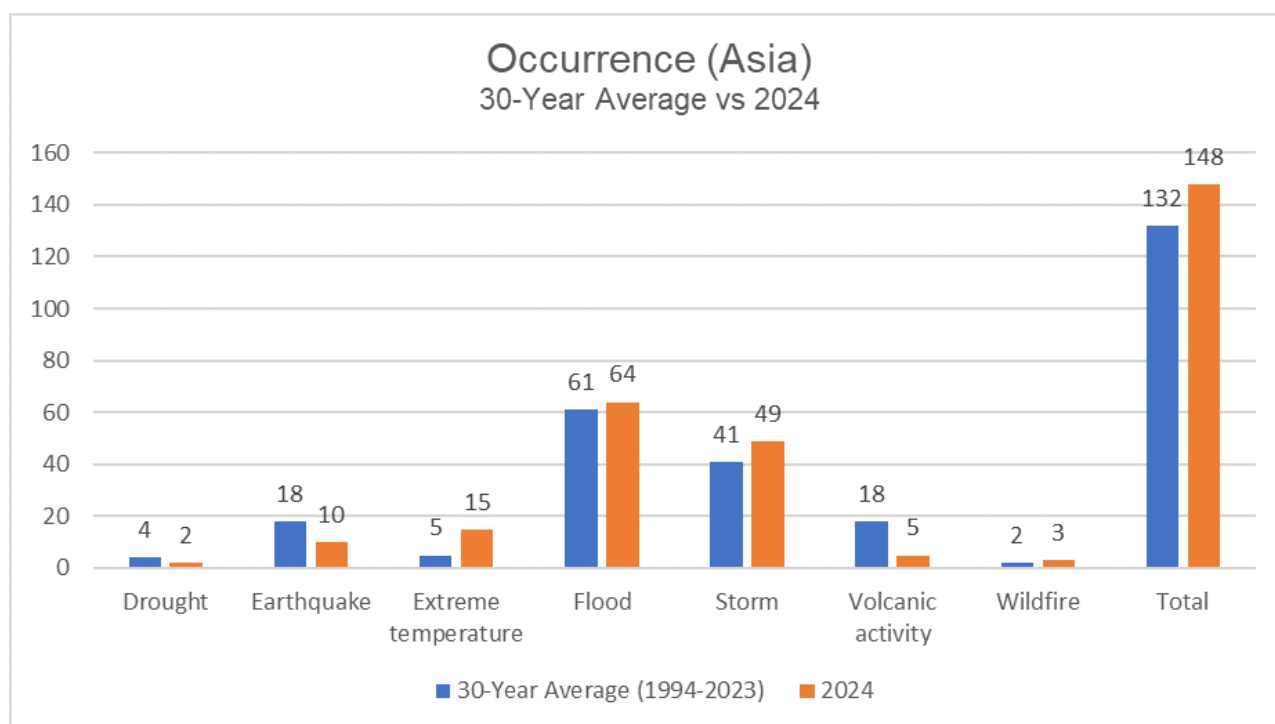


Figure 7.7 Number of occurrences by disaster type in Asia: 30-Year Average vs 2024 (EM-DAT/CRED, 2025)

Looking at the data by disaster type, we can observe the following:

- Number of occurrences of extreme temperature, floods, and storms is higher in 2024 compared with the 30-year average.
- Number of occurrences of earthquake is lower in 2024 compared with the 30-year average/

Insights: Unlike the global trend (where the occurrence of flood is lower in 2024 than the 30-year average), Asia continually shows an increasing trend of flood occurrence.

TOP 10 COUNTRIES WITH HIGH
DISASTER OCCURRENCE IN 2024

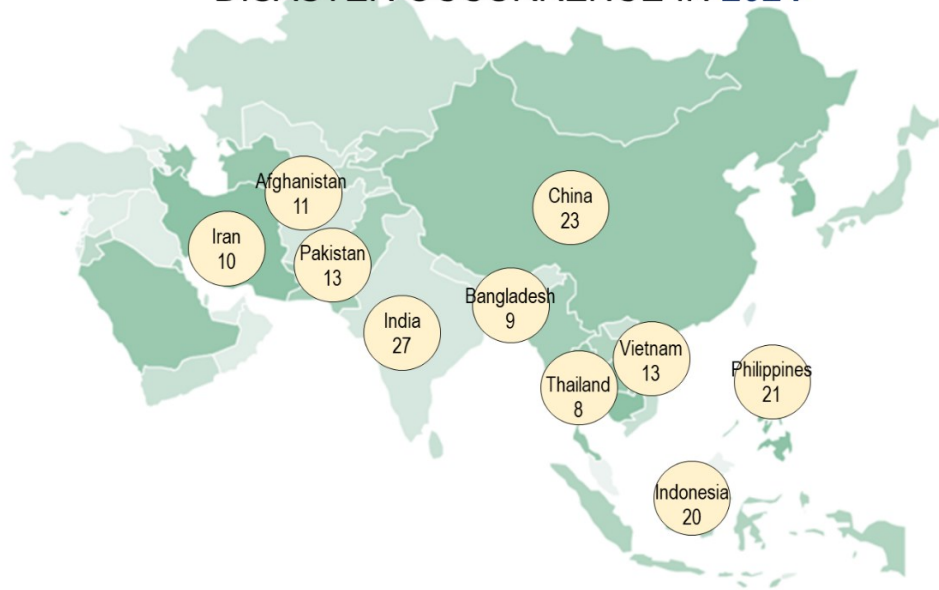


Figure 7.8 Top ten countries in Asia with the highest number of disaster occurrence in 2024 (EM-DAT/CRED, 2025)

Figure 7.8 shows the top ten countries in Asia with the highest number of disaster occurrence in 2024 are: India (27 events), China (23 events), Philippines (21 events), Indonesia (20 events), Pakistan (13 events), Viet Nam, (13 events), Afghanistan (11 events), Iran (10 events), Bangladesh (9 events), and Thailand (8 events).

(2) Deaths (Asia)

DECREASING TREND. As shown in Figure 7.9, the number of people killed by disasters in 2024 in Asia is lower (8,916 deaths) than the 30-year average (31,853 deaths).

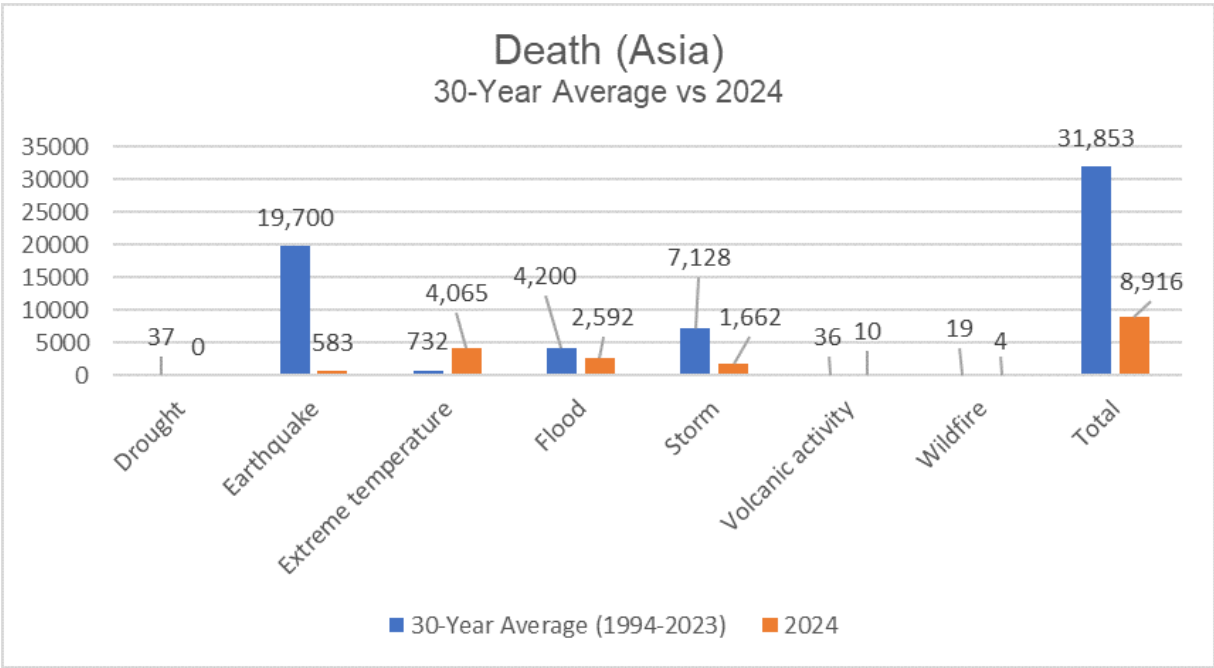


Figure 7.9 Number of people killed by disaster type in Asia: 30-Year Average vs 2024 (EM-DAT/CRED, 2025)

Looking at the data by disaster type, we can observe the following:

- While the number of deaths is generally decreasing, this trend does not apply to extreme temperature, where in 2024, more people died (4,065 deaths) than the 30-year average (732 deaths).

Insights: Disaster preparedness measures (e.g., awareness-raising and drills) and improved disaster management systems may reduce the number of deaths. It is also crucial to regularly monitor and assess the risk of other disaster types, such as extreme temperature, as deaths from this disaster is higher in 2024 than the 30-year average.

(3) People Affected (Asia)

DECREASING TREND. As shown in Figure 7.10, the number of people affected by disasters in 2024 in Asia is lower (109.7 million people) than the 30-year average (163.4 million people).

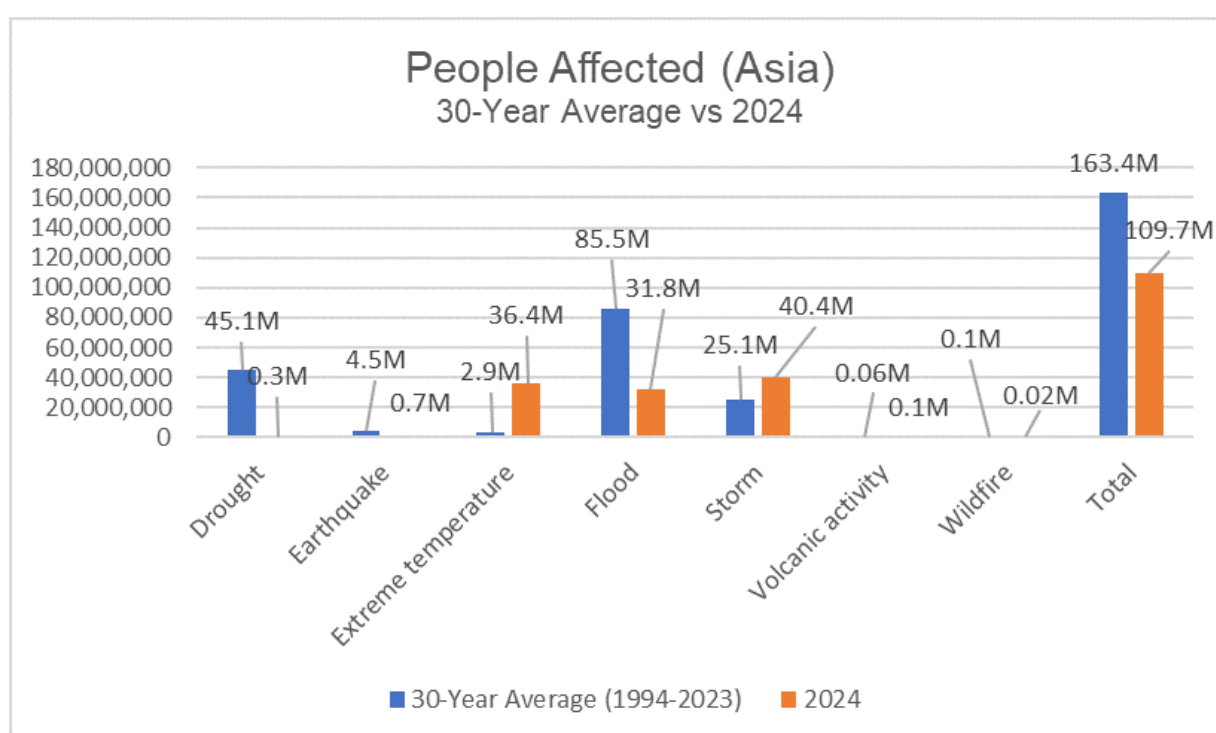


Figure 7.10 Number of people affected by disaster type in Asia: 30-Year Average vs 2024 (EM-DAT/CRED, 2025)

Looking at the data by disaster type, we can observe the following:

- Overall, the number of people affected by disaster in 2024 decreased than the 30-year average, however, this trend does not hold for storms. 40.4 million people were affected by storms in 2024, which is higher than 30-year average of 25.1 million people.
- The same is true with extreme temperature. People affected by extreme temperature in 2024 is 36.4 million people, higher than 30-year average of 2.9 million people.

Insights: The observations above imply that many people in Asia are exposed and vulnerable to extreme heat and storms. Countermeasures to reduce the number of people affected by these disaster types can be further improved, such as through knowledge exchange and technology transfer.

(4) Economic Losses (Asia)

DECREASING TREND. As shown in Figure 7.11, the economic losses from disasters in 2024 in Asia is lower (USD31.9 billion) compared with the 30-year average (USD55.8 billion). This is opposite of the global trend, where the economic losses from disasters show an increasing trend. At a glance, this trend looks promising. However, before inferring that it might be due to the improvement in disaster risk management or on better early warning systems, it is necessary to look at the details of the source data. Firstly, there are no 2024 data on economic losses for three of the disaster types that are covered in this analysis (i.e., extreme temperature, volcanic activity, and wildfire). On the contrary, the 30-year average includes all data for these three disaster types for the past 30 years (1994–2023). Secondly, it should be recalled that there were huge disasters in 2023 (e.g., Türkiye-Syria earthquakes and South Asia flooding) that could have affected the 30-year average economic losses.

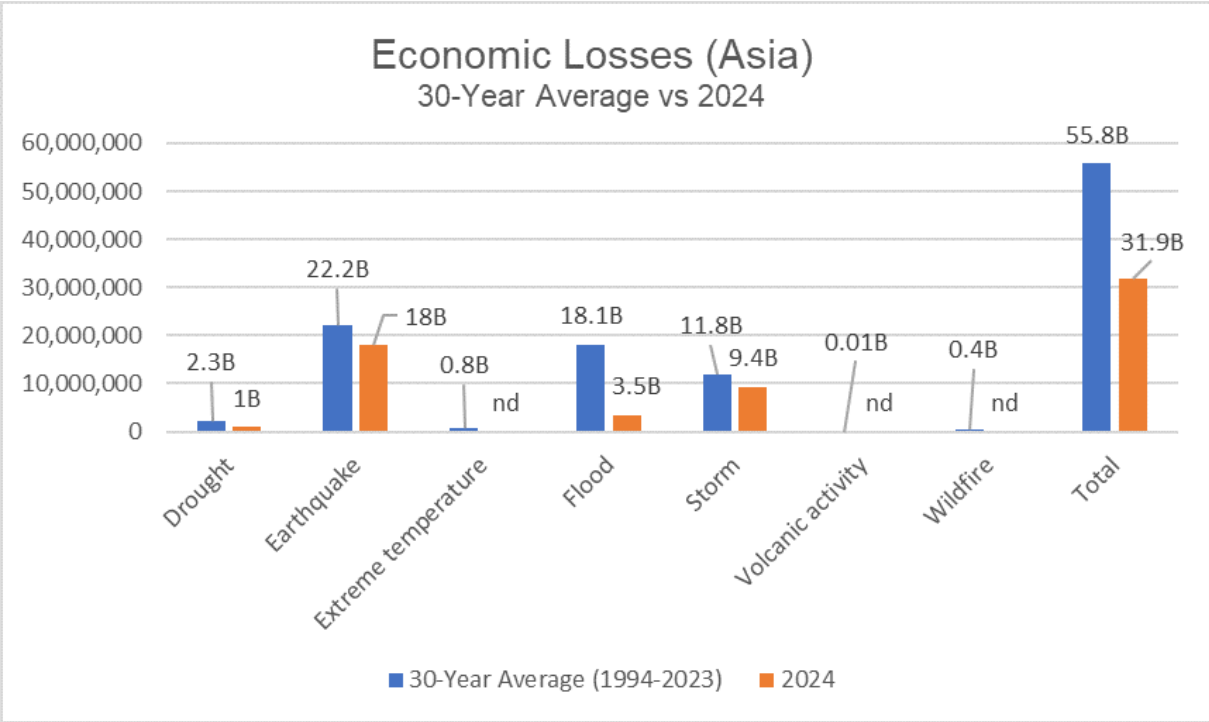


Figure 7.11 Economic losses by disaster type in Asia: 30-Year Average vs 2024 (EM-DAT/CRED, 2025)

Looking at the data by disaster type, we can observe the following:

- There are no 2024 data on economic losses for three specific disaster types: extreme temperature, volcanic activity, and wildfire.
- The other four disaster types: drought, earthquake, flood, and storm—where data is available, there is a decreasing trend of economic losses in 2024 in Asia compared with the 30-year average.

Insights: Since there is no data in three of the seven disaster types covered in this analysis, a disclaimer is emphasized in this Databook.

7.2 Climate-Related Disasters

Climate change is attributed as one of the reasons for higher occurrences of disaster each year. Extreme temperature, frequent floods, and intense storms are often attributed to climate change. According to the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6), the frequency and intensity are expected to further increase with every additional increment of global warming. To understand the trends of climate-related disasters, this Databook reviews five disaster types (i.e., drought, extreme temperature, flood, storm, and wildfire) in terms of occurrence, people affected, and economic losses.

7.2.1 Global Trend in Climate-related Disasters

In 2024, wildfires, floods, and droughts impacted millions of people across the globe. Severe drought affected millions of people in Zambia, Malawi, and Zimbabwe. Droughts in the Amazon fueled record wildfires in Brazil and Bolivia. Record heatwaves were experienced in Japan, India, Pakistan, Mexico, and across Europe. Devastating floods were experience across central and eastern Europe. Destructive storms (e.g., Hurricane Helene and Hurricane Milton) made landfall in the United States while super typhoon Yagi caused severe flooding and displacement in Southeast Asia. Climate change is making many hazards more intense and frequent.

(1) Occurrence (Global)

INCREASING TREND. As shown in Figure 7.12, the occurrence of climate-related disasters in 2024 is higher (340 events) than the 30-year average (301 events). Storms and wildfires have increased in frequency.

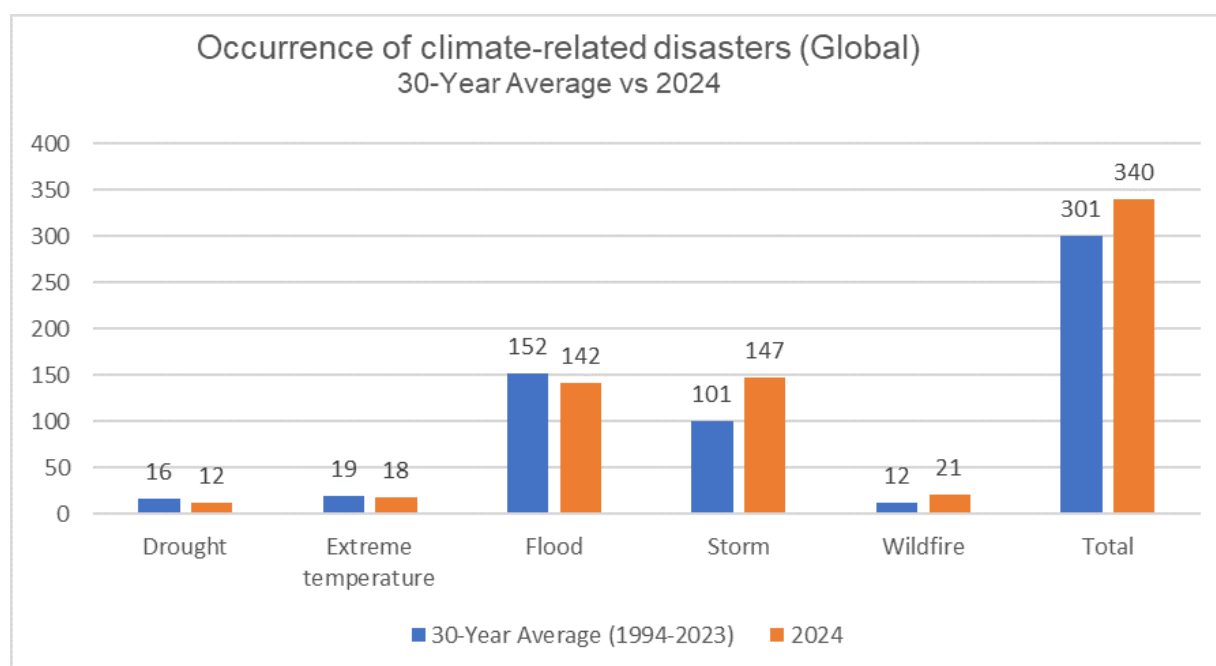


Figure 7.12 Global occurrence of climate-related disasters: 30-Year Average vs 2024 (EM-DAT/CRED, 2025)

(2) People Affected (Global)

DECREASING TREND. Figure 7.13 shows that the number of people affected by climate-related disasters in 2024 is lower (162.7 million people) than the 30-year average (189.8 million people). However, storms and extreme temperature remain an exception. In 2024, the number of people affected by storm is higher (47.9 million people) than the 30-year average (31.7 million people). Also, in 2024, the number of people affected by extreme temperature is higher (36.4 million people) than the 30-year average (3.3 million people).

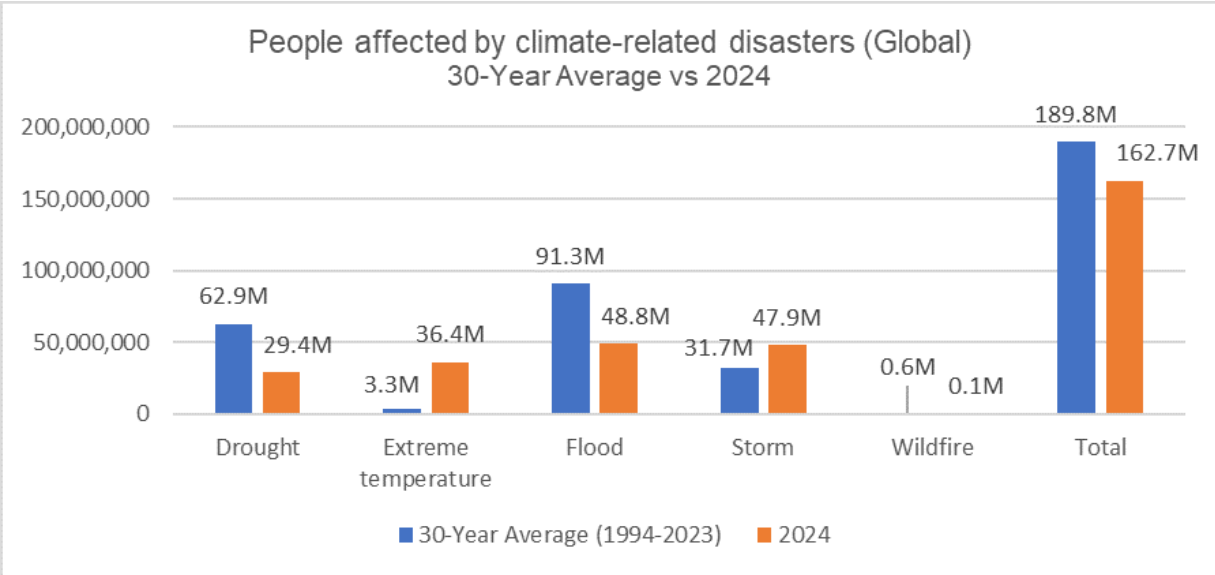


Figure 7.13 People affected by climate-related disasters (globally): 30-Year Average vs 2024 (EM-DAT/CRED, 2025)

(3) Economic Losses (Global)

INCREASING TREND. Figure 7.14 indicates the economic losses from climate-related disasters in 2024 is higher (USD223.4 billion) than the 30-year average. This increasing trend can be observed across all disaster types (except for extreme temperature, where data is not available for 2024).

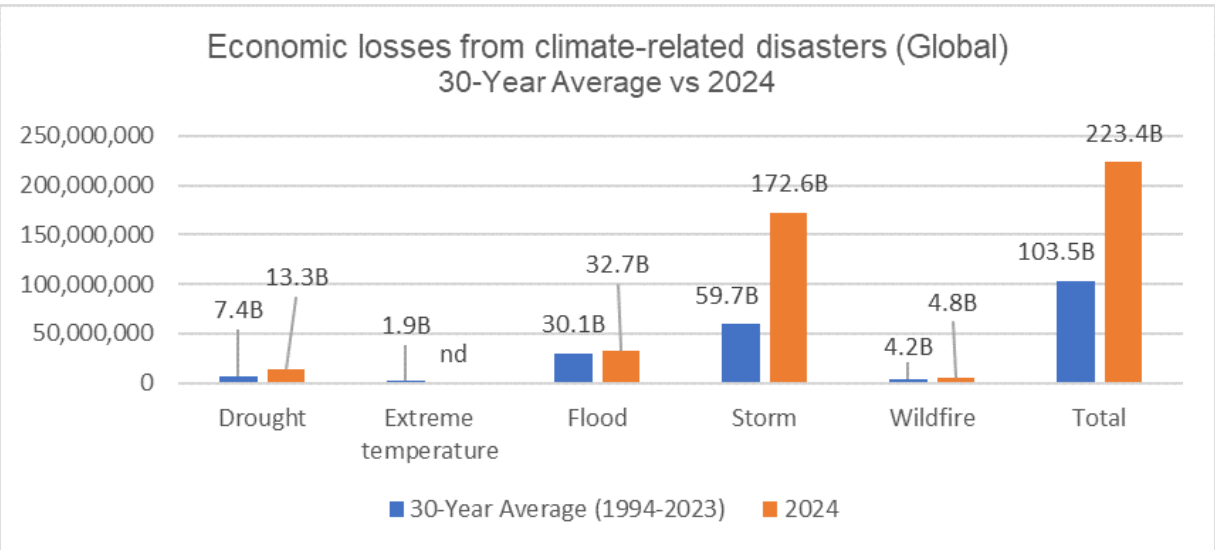


Figure 7.14 Global economic losses from climate-related disasters: 30-Year Average vs 2024 (EM-DAT/CRED, 2025)

7.2.2 Asian Tend in Climate-related Disasters

In 2024, Asia experienced a wide spectrum of climate-related disasters, including extreme temperature, storms, flooding, and drought. China experienced widespread flooding due to heavy monsoon rains. India and Pakistan were impacted by flash floods and heavy rains. United Arab Emirates, Oman, Iran, and Bahrain were also impacted by severe flooding. Most significantly, Viet Nam, Philippines, Lao PDR, and Myanmar were hit by super typhoon Yagi, one of the six unprecedented typhoons in just a month. These trends underscore the urgent need for enhanced adaptation, early warning systems, and climate resilience across the region.

(1) Occurrence (Asia)

INCREASING TREND. As shown in Figure 7.15, the occurrence of climate-related disasters in 2024 in Asia is higher (133 events) than the 30-year average (113 events). Except for drought, all other climate-related disaster types are increasing in 2024.

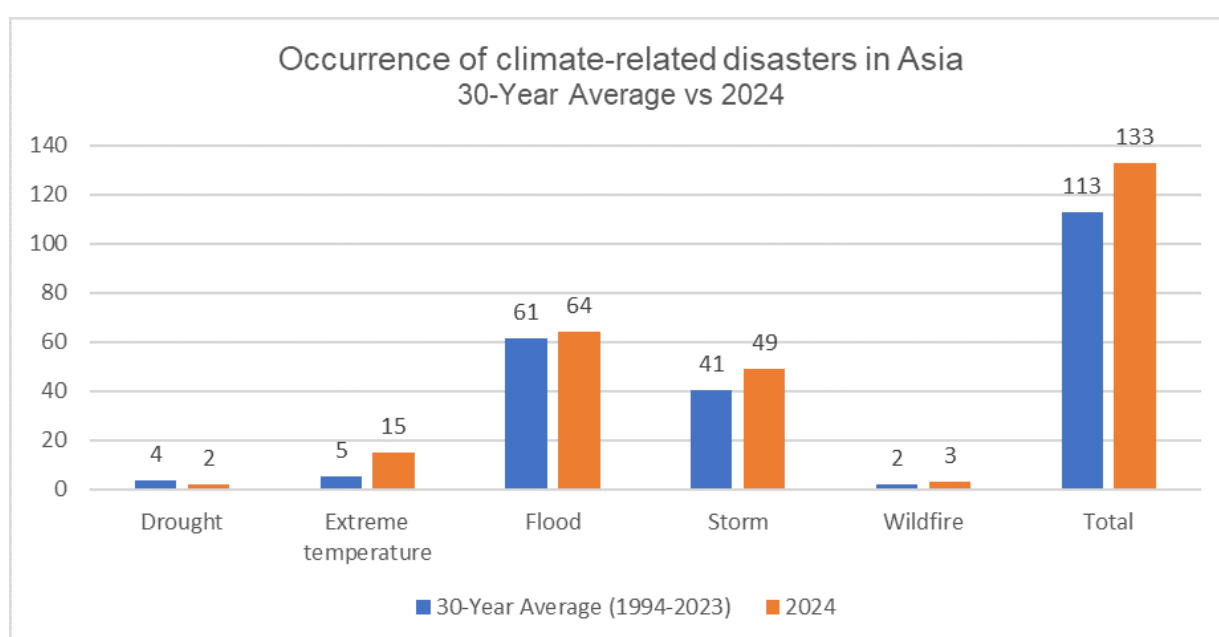


Figure 7.15 Occurrence of climate-related disasters in Asia: 30-Year Average vs 2024 (EM-DAT/CRED, 2025)

(2) People Affected (Asia)

DECREASING TREND. Figure 7.16 indicates that the number of people affected by climate-related disasters in 2024 in Asia is lower (108.8 million people) than the 30-year average (158.8 million people). Like the global trend, this does not hold for storms and extreme temperature. In 2024, the number of people affected by storm is higher (40.4 million people) than the 30-year average (25.1 million people). Also, in 2024, the number of people affected by extreme temperature is higher (36.3 million people) than the 30-year average (2.9 million people).

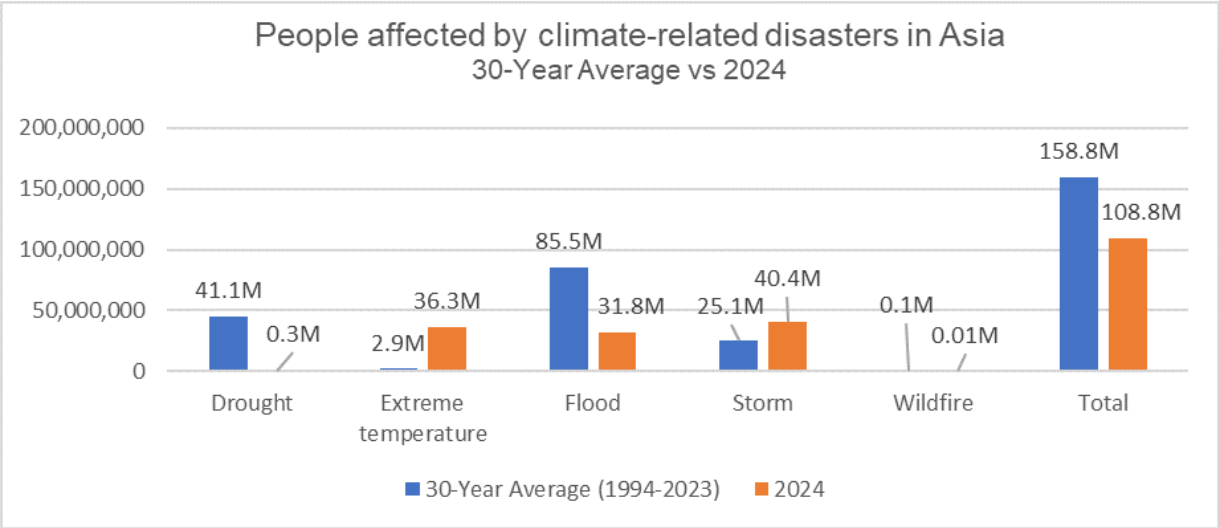


Figure 7.16 People affected by climate-related disasters in Asia: 30-Year Average vs 2024 (EM-DAT/CRED, 2025)

(3) Economic Losses (Asia)

DECREASING TREND. As shown in Figure 7.17, the economic losses from climate-related disasters in 2024 in Asia is lower (USD13.9 billion) than the 30-year average (USD33.5 billion). As mentioned in Section 7.1.2 (4), there are no 2024 data on economic losses for three of the disaster types (i.e., extreme temperature, volcanic activity, and wildfire). On the contrary, the 30-year average includes all data for these three disaster types for the past 30 years (1994–2023). Secondly, it should be recalled that there were huge disasters in 2023 (e.g., Türkiye -Syria earthquakes and South Asia flooding) that could have affected the 30-year average economic losses.

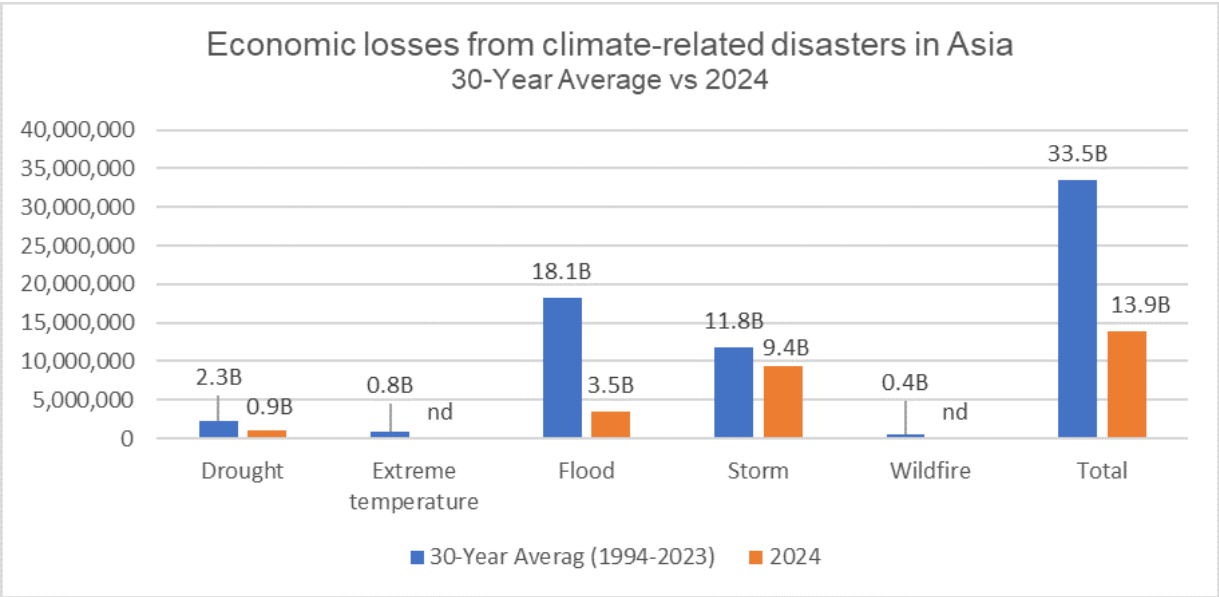


Figure 7.17 Economic losses from climate-related disasters in Asia: 30-Year Average vs 2024 (EM-DAT/CRED, 2025)

Annexes

History of Establishment of ADRC

1990s: International Decade for Natural Disaster Reduction (IDNDR)

At its 42nd General Assembly in December 1987, the United Nations (UN) designated the 1990s as the International Decade for Natural Disaster Reduction (IDNDR). It adopted a resolution aiming to sharply reduce the damage caused by natural disasters around the world, particularly in developing countries, through joint international action.

1994: World Conference on Natural Disaster Reduction

In May 1994, the UN held the World Conference on Natural Disaster Reduction in Yokohama, Japan, to conduct an interim review of the decade-long IDNDR initiative and to propose an action plan for the future. At the meeting, the “Yokohama Strategy for a Safer World” was adopted, highlighting the importance of international cooperation in regions that share common types of disasters and disaster reduction measures. Since then, disaster reduction activities have been promoted throughout the world based on this strategy.

1995: Ministerial-level Asian Natural Disaster Reduction Conference

As the first step toward regional cooperation under the Yokohama Strategy, the IDNDR Secretariat organized a meeting in Kobe in December 1995 to formulate a policy on disaster reduction cooperation in Asia. Cabinet members in charge of disaster reduction from 28 countries attended the meeting, which concluded with the adoption of the Kobe Disaster Reduction Declaration. This declaration consists of ideas for promoting international cooperation in disaster reduction, including a Japanese proposal to launch a feasibility study on a system for coordinating disaster reduction efforts in the Asian region.

1996: Asian Natural Disaster Reduction Experts Meeting

The Government of Japan and the IDNDR Secretariat jointly organized an expert meeting in October 1996 to thresh out how a central disaster reduction system, as stated in the Kobe Disaster Reduction Declaration, might be created for the Asian region. The meeting was attended by key personnel in the disaster reduction bureaus of 30 countries, and they agreed to study the creation of the tentatively named “Asian Disaster Reduction Center (ADRC)” to serve as a secretariat for promoting activities under the proposed system.

1997: Asian Disaster Reduction Cooperation Promotion Meeting

Again, the Government of Japan and the IDNDR Secretariat jointly organized a meeting in Tokyo in June 1997 to discuss activities to be undertaken by the proposed center for disaster reduction system. Likewise, the key

personnel from the disaster reduction bureaus of 23 countries attended the meeting with an overall goal of promoting cooperation in disaster reduction efforts through specific actions. A proposal was made at the meeting to establish a center in Japan to serve as the secretariat for the proposed system.

1998: Establishment of ADRC

Gaining momentum from these series of meetings, the Government of Japan discussed the organization, budget, and other aspects of the proposed office with the other countries involved. With the cooperation of Hyogo Prefecture, ADRC was officially established in Kobe on 30 July 1998.

2020: Launch of ADRC Foundation

In April 2020, the ADRC Foundation was launched. This made ADRC independent from URDI after 21 years and obtained a corporate status. Under this newly reconfigured status, ADRC gained greater flexibility in performing its international operations as well as bolstering its domestic activities.

Overview of International Recovery Platform

[IRP](#) was established following the Second UN World Conference on Disaster Reduction in Kobe, Hyogo, Japan in 2005 to support the implementation of the Hyogo Framework for Action (HFA) by addressing the gaps and constraints experienced in the context of post-disaster recovery. After a decade of functioning as an international source of knowledge on good recovery practice, IRP refocused its role as an "international mechanism for sharing experience and lessons associated with build-back-better".

IRP is not an operational body. So, it does not directly implement project activities. Instead, it functions as a platform for interested partners to periodically meet to exchange lessons and ideas that will promote recovery best practice and learnings as well as capacity building. Its activities are governed by a Steering Committee and supported by a small Secretariat based in Kobe Japan and hosted by the Japanese Government, the Hyogo Prefectural Government, ADRC, and UNDRR.

IRP works towards supporting greater advancements in the field of resilient recovery and build-back-better by:

- bringing together a broad range of senior policy makers and practitioners to exchange experiences and facilitate discussion on resilient recovery challenges and build-back-better opportunities at the annual International Recovery Forum
- advocating for closer cooperation with development partners, regional intergovernmental organizations, regional organizations, and regional platforms for disaster risk reduction in promoting and building capacity for achieving effective build-back-better outcomes
- sharing of information through its inter-active website

IRP is governed by the Steering Committee, where membership is decided by consensus. Steering Committee members contribute towards the approved activities of IRP, by means of commitment of funds or in-kind contributions. The Steering Committee members can request the Chair for technical experts or specialist to attend meetings on an ad-hoc basis to provide specialist inputs as and when deemed necessary. The members of IRP Steering Committee are: ADB, ADRC, Cabinet Office Japan, CEPREDENAC, Hyogo Prefectural Government Japan, ILO, MOFA-Italy, SDC-Switzerland, the World Bank, UN-Environment, UNCRD, UNDP, UNESCO, UN-Habitat, UNDRR, UNOPS, and WHO (Figure 1 Logos of IRP SC members)



Figure 1. Logos of IRP SC Members

Notes on Sources of Data

Natural Disaster Data

All disaster data are based on EM-DAT: The Emergency Events Database - Université catholique de Louvain (UCL) - CRED, www.emdat.be, Brussels, Belgium. Datasets created on [2 June 2025](#), were utilized throughout the document unless otherwise stated. The presentation of data in Databook 2024 focused only on seven disaster types: drought, earthquake, extreme temperature, flood, storm, volcanic activity, and wildfire.

EM-DAT Criteria:

For a disaster to be entered into the database, at least one of the following criteria must be fulfilled:

- Ten (10) or more people reported killed
- Hundred (100) or more people reported affected
- Declaration of a state of emergency
- Call for international assistance

Databook 2024 follows the EM-DAT definitions of “people killed” as persons confirmed as dead and persons missing and presumed dead; “people affected” as the sum of injured, homeless, and affected requiring immediate assistance during the period of emergency and requiring basic survival needs such as food, water, shelter, sanitation and immediate medical assistance.

Disaster Terms:

Drought includes an extended period of unusually low precipitation that produces a shortage of water for people, animals and plants.

Earthquake includes ground shaking and tsunamis.

Epidemic includes bacterial and viral infectious diseases.

Extreme Temperature includes heat wave, cold wave, and extreme winter conditions.

Flood includes general flood, and flash flood.

Insect Infection is pervasive influx and development of insects or parasites affecting humans, animals, crops and materials.

Landslide includes avalanche, debris, and rockfall.

Storm includes local storm, tropical cyclone, and winter storm.

Volcanic activity means volcanic eruption.

Wildfire includes bush/brush fire, forest fire, and scrub/grassland fire.

Classification of EM-DAT:

EM-DAT distinguishes between two generic categories for disasters: natural and technological. The natural disaster category is divided into 5 sub-groups, which in turn cover 15 disaster types and more than 30 sub-types. The technological disaster category is divided into 3 sub-groups which in turn cover 15 disaster types.