1. Asian Disaster Reduction Center.

1. Asian Disaster Reduction Center

The Asian Disaster Reduction Center (ADRC) was established in 1998 as 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, GLobal 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 of functioning as part of the Urban Disaster Research Institute (URDI), ADRC became independent and obtained a corporate status in April 2020 following the launch of the ADRC Foundation. Under this newly 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. Map of member and advisor countries) as well as partner organizations. Member countries share information, experiences, and expertise on DRR and ADRC disseminates them regionally by means of dispatching of experts and other methods. Advisor countries support the activities of ADRC by sharing their expertise and experiences through the dispatch of experts to member countries and to the ADRC Secretariat as well as offer financial contributions.

Figure 1.1 The 33-member countries of ADRC 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, the Republic of Iran in 2012, Republic of 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. Member and Advisor Countries).

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, Vietnam, 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	Islamic Republic of Iran
2018	Republic of 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 Management Office (NDMO)
India	Ministry of Home Affairs
Indonesia	National Disaster Management Agency (BNPB)

Country	Counterpart
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
Vietnam	Vietnam 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 (OCHA), 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 bodies and organizations in Asia.

2. Highlights of FY2023.

2.   Highlights of FY 2023

Fiscal Year 2023 highlighted the successful organization of the Asian Conference on Disaster Reduction ACDR2023) in Tajikistan, the conduct of two study visits to earthquake-impacted areas (Türkiye and Japan), and the joint-implementation of the Study Visit to Japan of the AHA Centre Executive Leadership in Emergency and Disaster Management Programme (ACE-LEDMP).

2.1   Activities in Figures

At a glance, Figure 2.1 shows ADRC milestones of FY 2023 in three activity areas: 1) information sharing; 2) human resource development; and 3) international cooperation.

ADRC MILESTONES OF FISCAL YEAR 2023

INFORMATION SHARING

7,700+ Cumulative total of GLIDE numbers issued towards the end of FY2023
2,658 Items of "latest disaster information" on the online database
27 Requests activated by Sentinel Asia
1 Asian Conference on Disaster Reduction (ACDR2023) organized in Tajikistan
1 Tsunami Seminar organized
2 Study visits to disaster-impacted areas organized (Turkey & Japan)

HUMAN RESOURCE DEVELOPMENT

132 Cumulative total of Visiting Researchers (VRs) as of FY2023
7 JICA-commissioned DRR Training Courses implemented
3 Interns accepted
4 Short-term programs conducted

INTERNATIONAL COOPERATION

17 International events that ADRC engaged in (e.g., Typhoon Committee)
5 Collaborative projects implemented with partners (e.g., ACE-LEDMP)
2 Regional initiatives, where ADRC served as co-chair (i.e., EPWG, Sentinel Asia)

Figure 2.1 Highlights of ADRC Activities in FY 2023

2.2   Asian Conference on Disaster Reduction 2023

Held at the Hyatt Regency Dushanbe on 20 October 2023 in Dushanbe, Tajikistan, the Asian Conference on Disaster Reduction (ACDR2023) adopted the theme, "Effective Implementation of DRR Measures: Enabling Digital Transformation in DRR". The Committee on Emergency Situations and Civil Defense under the Government of the Republic of Tajikistan (CoES) hosted the event, and co-organized it with the Cabinet Office Government of Japan and ADRC. ACDR2023 gathered 120 onsite participants comprising representatives from 18 member-countries, international and regional organizations, private sector, and academic/research institutes. Online participation reached 111 participants, including from 7 member-countries.

ACDR2023 covered a roundtable session on the implementation of the Sendai Framework for Disaster Risk Reduction and two thematic sessions:

- Thematic Session 1: Innovative Solutions for Resilient Societies: DRR Technologies for Earthquakes and Geological Hazards

- Thematic Session 2: Adaptation to the Climate Crisis: Innovative Approaches to Monitoring and Responding to Glacial Lake Outburst Floods (GLOFs) and Intensifying Floods

Figure 2.2 ACDR2023 Group Photo

2.2.1 Opening Session

Dignitaries, who graced the opening session, included 1) Ms Sattoriyon Matlubakhon Amonzoda, Deputy Minister, Republic of Tajikistan, 2) Ms Mami Mizutori, Special Representative of the UN Secretary-General for DRR and Head of UNDRR; 3) Mr MATSUMURA Yoshifumi, Minister of State for Disaster Management, Government of Japan; 4) Dr HAMADA Masanori, Chairman, ADRC and Professor Emeritus, Faculty of Science and Engineering, Waseda University; and 5) Mr Rustam Nazarzoda, Chairman of the CoES under the Government of the Republic of Tajikistan.

" Tajikistan is committed to implementing the Sendai Framework for Disaster Risk Reduction through various initiatives, including investment in resilient infrastructure and the adoption of the National Disaster Risk Management Strategy."

Ms Sattoriyon Matlubakhon Amonzoda
Deputy Prime Minister
Republic of Tajikistan

" By 2030, climate change will result in 30% reduction of crop yields and will cause over 5 million people to be internally displaced in Central Asia. Embracing digital transformation through the application of data analytics and machine learning will support evidence-based and data-driven decisions to address the issue."

Ms Mami Mizutori
Special Representative of the UN Secretary-General for DRR
Head, United Nations Office for Disaster Risk Reduction

" The devasting disasters of 2023, such as the earthquakes in Türkiye and Syria in February, highlighted the importance of identifying disaster risk information, promoting investments for mitigation, and sharing of experience on 'build back better'."

Mr MATSUMURA Yoshifumi
Minister of State for Disaster Management
Government of Japan

" The increasing threat of climate change-induced disasters implies that it is crucial to enhance disaster resilience of infrastructures and social systems through hardware measures and adaptation."

Dr HAMADA Masanori
Chairman, Asian Disaster Reduction Center
Professor Emeritus, Faculty of Science and Engineering, Waseda University

" Tajikistan is one of the UN pilot areas of Early Warnings for All initiative, and as a host of Asian Conference on Disaster Reduction (ACDR2023), Tajikistan looks forward to greater unity of efforts in the international community."

Mr Rustam Nazarzoda
Chairman, CoES
Republic of Tajikistan

2.2.2   Roundtable Session

The roundtable provided member countries with an opportunity to discuss how to leverage collective action and cooperation in accelerating the implementation of the Sendai Framework to 2030. It was co-chaired by Mr Rustam Nazarzoda (Chairman, CoES under the Government of the Republic of Tajikistan), Ms TSUNOZAKI Etsuko (Board Member, SEEDS Asia), and Mr Sebastian Penzini (Acting Head, Regional Office for Europe and Central Asia, UNDRR).

Mr Rustam Nazarzoda
Chairman, CoES
Republic of Tajikistan

Ms TSUNOZAKI Etsuko
Board Member, SEEDS
Asia

Mr Sebastian Penzini
Acting Head, RO for Europe
and Central Asia, UNDRR

Figure 2.3 Co-chairs of the Roundtable Session

Setting the tone for the official statements, Mr Penzini highlighted the gaps reported under each of the four priorities following the Midterm Review of the Sendai Framework in May 2023. In Priority 1, availability of data is reported as a major gap, particularly on disaster losses, multi-hazard risk projections, and climate change scenarios that are useful for strategic planning and investment. In Priority 2, the gaps include the continuing siloes approach of disaster risk governance as well as inadequate efforts for inclusiveness of vulnerable groups and most-at-risk communities. In Priority 3, the most important gap that needs to be addressed is the limited investment made in DRR across all levels of the governments, including investment for climate action. While gaps are not specifically highlighted in Priority 4, the Midterm Review calls on a strategic way of going forward covering all other priorities, embracing new technologies and digital transformation.

Officials from Armenia, Bhutan, Indonesia, Iran, Malaysia, Maldives, Mongolia, Nepal, Pakistan, Papua New Guinea, Philippines, Singapore, Sri Lanka, Tajikistan, Thailand, and Vietnam delivered statements highlighting the progress and challenges in implementing the Sendai Framework.

Figure 2.4 Government officials who delivered statements at the Roundtable Session

The official statements offered the following recommendations to address the gaps:

- Scale-up sharing of policies and measures that promote DRR efforts in a coordinated manner, particularly on policies relating to disaster database, early warning, and community-based disaster risk management as well as measures relating to information management systems, regional knowledge sharing, and disaster response mechanisms.

- Promote sub-regional cooperation in addressing complex and transboundary disaster risks, particularly earthquakes, floods, and typhoons.

- Forge partnerships and joint projects in the areas of hazard and risk identification, mapping, and assessments in a manner that puts greater emphasis in science-based approaches and embrace digital technologies for multi-hazards disaster risk reduction.

2.2.3 Session 1: Innovative Solutions for Resilient Societies: DRR Technologies for Earthquakes and Geological Hazards

Co-chaired by Mr Pulod Aminzoda (Director of the Institute of Geology, Earthquake Engineering and Seismology of the National Academy of Sciences of Tajikistan) and Dr Sos Margaryan (Director, National Survey for Seismic Protection of Armenia), this session tackled the latest solutions for ground DRR through multifaceted approaches, including visualization of disaster risk using digital transformation, measures for earthquake resistance and slope stabilization in cities, and development of design technologies for disaster-resistant buildings/structures.

Mr Pulod Aminzoda
Director, IGEES/NAS
Republic of Tajikistan

Dr Sos Margaryan
Director, NSSP
Armenia

Figure 2.5 Co-chairs of Thematic Session 1

Speakers from Tajikistan, Kyrgyz Republic, IRIDeS, UNDRR, CoES, and Türkiye stressed the importance of multi-faceted approach to cope with earthquake disasters, including citywide seismic intensity estimation and DRR measures using sensors and AI technology, development of new building technologies and materials, and urban planning that incorporates a DRR perspective.

Mr Pulod Aminzoda
Director, IGEES/NAS
Republic of Tajikistan

Mr Ulan Abdybachaev
Deputy Head, CAIAG
Kyrgyz Republic

Prof. David N. Nguyen,
Associate Professor, IRIDeS
Tohoku University, Japan

Mr Dilshod Kodirov
National Coordinator
UNDRR in Tajikistan

Mr Azizjon Azizmurodzoda
Researcher, CoES
Republic of Tajikistan

Prof. Dr Orhan Tatar
General Director, ERR/AFAD
Ministry of Interior, Türkiye

Figure 2.6 Speakers of Thematic Session 1

Mr Azizjon Azizmurodzoda (Tajikistan) reported that CoES regularly promotes disaster education programs at schools, kindergarten, and other education facilities; inspects buildings against earthquake; and conducts search and rescue exercises to prepare the population for earthquakes in Tajikistan. Mr Ulan Abdybachaev (Kyrgyz Republic) reported the development of local disaster risk reduction plan through the analyses of damage assessment, structural and non-structural measures, and residual risks under the scenario of M7.5 earthquake in Bishkek. Prof. David N. Nguyen (IRIDeS) presented the progress of Japanese Smart Community Infrastructure Data Sharing Systems using the ISO standards for disaster risk reduction, including developing guidelines for implementing seismometer systems and basic framework for the implementation of DRR measures. Mr Dilshod Kodirov (UNDRR) reported the activities in Tajikistan in support of the Early Warning for All (EW4All) such as the conduct of workshops on Analyzing the National EWS and Identifying the Gaps to draft a national roadmap. Prof. Dr Orhan Tatar (Türkiye) reported the establishment of Earthquake Clearinghouse and Earthquake Information System within AFAD to support the response and recovery programs following the 6 February 2023 earthquakes.

2.2.4 Session 2: Adaptation to the Climate Crisis: Innovative Approaches to Monitoring and Responding to Glacial Lake Outburst Floods (GLOFs) and Intensifying Floods

This session was co-chaired by Prof. Abdulhamid Kayumov (Director of the Center for Glacier Studies of the National Academy of Sciences of Tajikistan) and Dr Changje Kwak (Research Scientist, National Disaster Management Research Institute, Republic of Korea). It focused on innovative approaches to monitoring and responding to GLOFs, forest fires, and floods.

Figure 2.7 Co-chairs of Thematic Session 2

Speakers from Tajikistan, CESDRR, ICIMOD, Republic of Korea, CoES and Agha Khan discussed the efforts and challenges against climate-related disasters, such as increased glacial lake outburst floods, frequent and widespread forest fires, and prolonged and more damaging floods.

Prof. Abdulhamid Kayumov
Director, CGS/NAS
Republic of Tajikistan

Mr Serik Aubakirov
Director, CESDRR
Central Asia and Caucasus

Dr Mandira Singh Shrestha
Senior Specialist, ICIMOD
Nepal

Dr Changje Kwak
Research Scientist, NDMI
Republic of Korea

Ms Firuza Tursunzoda
Head, NDRM Project/CoES
Republic of Tajikistan

Mr Najib Yaminov
Head, ES Dept., Habitat Branch
Aga Khan Agency in Tajikistan

Figure 2.8 Speakers of Thematic Session 2

Prof. Abdulhamid Kayumov (Tajikistan) discussed the value of collecting and monitoring glacial data – such as through remote sensing, use of unmanned aerial vehicles (UAVs), and isotopic analysis – for disaster risk reduction efforts. Mr Serik Aubakirov (CESDRR) reported the role of drones in monitoring flood and mudflow-prone areas, identifying and locating wildfires, and assisting in search and rescue missions, particularly in mountainous regions. He also mentioned the utilization of open-source data in mapping and data collection. Dr Mandira Singh Shrestha (ICIMOD) reported that the Hindu Kush Himalayan (HKH) region is facing a climate crisis with rising temperatures leading to the increasing risks to glacial run-offs and more than 400 GLOFs. DRR efforts include inventory monitoring and early warning systems along with mitigation measures, such as constructing dams, reducing the size of glacial lakes, and lowering the lakes' water levels. Dr Changje Kwak (Republic of Korea) presented a flood risk assessment applied in Ulsan, which is based on five factors: buildings, land cover, population, rainfall, and water level. These factors are integrated into a risk assessment that employs scenarios and risk matrices. Ms Firuza Tursunzoda (Tajikistan) report the activities aimed at improving the monitoring and early warning systems for Sarez Lake and the Usio Dam. He mentioned that the four-component early warning system (remote satellite data, forecast information, on-site monitoring, and captures alerts) in Sarez Lake has been providing real-time data analysis and warning. Mr Najib Yaminov (Aga Khan Agency) presented various initiatives on monitoring glacial lakes, conducting annual helicopter analyses, building emergency shelters, establishing multipurpose playgrounds with essential supplies, and conducting community exercises as proactive approaches to addressing the unique challenges associated with glacial lake outburst hazards.

2.2.5 Closing Session

Mr SASAHARA Akio (Executive Director, ADRC), Dr OGAWA Yujiro (Executive Secretary, ADRC), and Mr Rustam Nazarzoda (Chairman, CoES Tajikistan) delivered the closing speeches.

"To forward the outcomes of ACDR2023, sharing of policies and strategies on disaster risk reduction must be undertaken in a more coordinated manner among ADRC member countries. Collaboration in the areas of disaster database, early warning systems, and community-based disaster risk management must be also strengthened."

Mr SASAHARA Akio
Executive Director
Asian Disaster Reduction Center

"As the frequency of disasters continues to increase worldwide, it is essential to learn from these events. ADRC is organizing a study visit to the 2023 Türkiye-Syria earthquakes-affected areas in Türkiye as part of such learning. This activity will strengthen disaster management and preparedness for future disasters."

Dr OGAWA Yujiro
Executive Secretary
Asian Disaster Reduction Center

"It is important to know the necessary measures to be taken for earthquake disaster risk reduction. To facilitate this, it is significant to gather and share data and information among ADRC member countries."

Mr Rustam Nazarzoda
Chairman, Center of Emergency Situations
Republic of Tajikistan

2.3 Study Visit to the 2023 Türkiye Earthquake-Affected Areas

In collaboration with the Disaster and Emergency Management Presidency (AFAD) of Türkiye, University of the Ryukyus, and Hacettepe University, ADRC organized a study visit to the 2023 Türkiye-Syria earthquake-affected areas in Türkiye on 21-23 October 2023. The team comprised officials from Mongolia, Papua New Guinea, Philippines, Singapore, and Vietnam. In addition, academics from the University of the Ryukyus and Hacettepe University as well as AFAD officials from Türkiye and ADRC staff members participated in the study visit to:

• Observe the impacts, challenges, and lessons from the earthquake disaster

• Gain insights on improving the DRR plans of ADRC member countries

• Facilitate knowledge and information exchange

Visiting three (Gaziantep, Kahramanmaras, and Hatay) of the eleven provinces impacted by the earthquake, the team learned that there was a relative slip between the Arabian and African plates that caused westward movement of the Anatolian plate that caused many vulnerable buildings to collapse. The team also observed that the housing reconstruction adopted a contractor-driven approach and built-in relocation sites. Affected families can own the house with payments maturing in 20 years under the following arrangements: 2 years of free rental and 18 years of payment, where 60% of the total cost is subsidized by the government.

Figure 2.9 Members of the study team

2.3.1 Fault movement

Türkiye sits on the Anatolian tectonic plate, which borders two major faults: 1) the North Anatolian Fault (NAF) that cuts across the country from west to east, and the 2) East Anatolian Fault (EAF) in the southeast. Several "fault breaks" occurred during the 2023 earthquakes, and the team had the opportunity to observe the locations and its impact on structures as shown in Figure 2.10. In Sekeroba, Gaziantep Province, fault lines caused surface rupture and completely damaged the school buildings. In Demirkopru, Hatay Province, ground liquefaction caused damage to agricultural land, bridge abutments, and access roads.

Figure 2.10 Surface rupture in Sekeroba (left); Liquefaction in Demirkopru (right)

2.3.2 Housing recovery process

Based on the data from AFAD, a total of **1,026,003** buildings/houses were completely damaged. This figure is about half of the 2,260,683 buildings/houses identified in the 11 provinces before the earthquakes. The basic concept of housing recovery process involves three phases. Phase 1: Tent Cities, where victims were settled in the tents for immediate relief. Phase 2: Container Shelters, where victims were transferred to container

shelters with livelihood support. Phase 3: Permanent House, where victims could permanently settle in houses that they could own.

(1)   Gaziantep Province: Atalar

Figure 2.11 shows on-going construction of permanent houses in Atalar, Gaziantep. In this village, each residential block size is about 600m^2, and the floor area of each house is about 120m^2. Each house has 3 rooms, and has living room, kitchen, bathroom, and toilet.

Figure 2.11 Construction of permanent housing in Atalar Village, Gaziantep Province

(2)   Kahramanmaras Province: Onikisubat

In Onikisubat, Kahramanmaras Province, state housing buildings that were constructed in 2020 for government employees withstood the earthquakes as it conformed with the national building code requirements. Since these buildings are safe and still unoccupied, the government offered these as permanent houses for the earthquake survivors. However, the location is isolated from the city center, and still need better services for transportation, markets, and hospitals to make the place more livable.

Figure 2.12 State buildings in Onikisubat, Kahramanmaras

(3)   Hatay Province: Kirikhan

Some permanent housing constructed for earthquake victims in Kirikhan, Hatay Province are five-storey apartment buildings (Figure 2.13). Each building has 2 underground floors and 3 stories after the ground floor. Each apartment has 3 bedrooms, 1 living room, a kitchen, bathroom, and toilet.

2.3.3   Key observations

Lessons learned from the study visit are summarized below:

- Liquefaction caused serious damage to buildings (e.g., settlement and tilting). This means that construction of more than 5-storey buildings in shallow foundations should consider soil improvement techniques against liquefaction

- In future planning and construction, full consideration should be given to the distribution and movement patterns of faults as well as the impact of hydrological and geological conditions on secondary disasters

Figure 2.13 Construction of apartment buildings in Kirikhan, Hatay Province

- The main cause of the collapse and heavy damage to reinforce concrete (RC) buildings during the 2023 earthquakes are the same as those of the previous Turkish earthquakes: a) lack of implementation of seismic codes in structural design, b) construction mistakes, negligence, and lack of moral, c) poor workmanship, d) soft floors, e) resonance phenomenon due to ground conditions, f) pounding of adjacent buildings, and g) liquefaction of ground

- Housing reconstruction approach is contractor-driven (i.e., private companies are contracted by the government to build the permanent house buildings).

- Permanent house buildings are built in relocation sites, as identified by the local governments in the areas.

- While many permanent house buildings are being constructed, some container cities are not yet ready to be occupied.

- There remains a huge task of demolishing severely damaged buildings in all three provinces.

Prior to the site-visit, ADRC prepared a [desk report](#) on the Türkiye-Syria earthquakes of the 2023. This report can be accessed on the ADRC website.

2.4   Report on the 2024 Noto Peninsula Earthquake

Following the M7.6 Noto Peninsula Earthquake that occurred on 1st January 2024 at 16:10 in Ishikawa Prefecture, Japan, ADRC prepared a report to facilitate sharing of disaster information to stakeholders, and making it immediately available on the website. Moreover, ADRC issued a GLIDE number, shared analyzed satellite imageries of disaster-impacted areas, and disseminated information on initial damage assessments.

2.4.1   Issuance of GLIDE number

ADRC issued GLIDE No. EQ-2024-000001-JPN for the 2024 Noto Peninsula Earthquake. This GLIDE number represents the global ID of the disaster, allowing practitioners and stakeholders access all online information about the disaster. All information sources (e.g., agencies, institutions, and media organizations) that utilize such GLIDE number are integrated in the disaster's global ID, accessible by clicking or searching this GLIDE number.

2.4.2   Satellite imageries

On behalf of its member countries, ADRC forwards the emergency observation request to space agencies under the Sentinel Asia. Through the emergency observation satellite imageries, Sentinel Asia supports disaster management activity in the Asia-Pacific region by applying space-based technology (i.e., earth observation satellites data) and WEB-GIS technology. Figure 2.14 is an example of an analyzed satellite images of the damaged area published on the Disaster Charter's website. The analysis was made by Chiba University showing burnt area highlighted by the yellow polygon.

More satellite images are on this link: https://sentinel-asia.org/EO/2024/article20240101JP.html
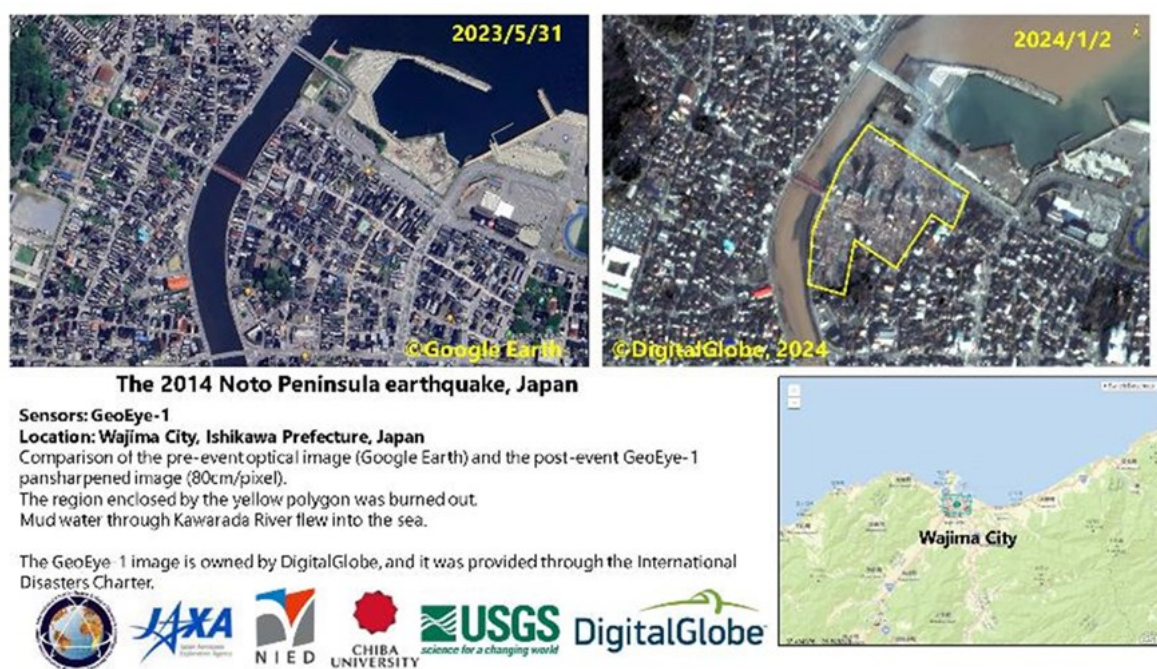
Figure 2.14 Example of analysed satellite images shared by ADRC as member of IDC

2.4.3   Assessments

ADRC's report on the 2024 Noto Peninsula Earthquake also included initial assessments in terms of deaths, people affected, damages, and losses as shown in Figure 2.15.

	From Official Report	Ishikawa Prefecture	Reference Information from Media
Killed	241	241	
Missing	0	11 (status unknown)	
Injured	Seriously injured: 320	312	
	Slightly injured: 975	872	
Evacuee	13,233 (in 517 shelters)	6,934 in 259 shelters	
House/ Building	Totally collapsed: 6,750	65,570 199 Official building were damaged.	• 7-storey building overturned in Wajima city
	Half collapsed: 7,714		• Many block walls collapsed.
	Partially collapsed: 34,694		
Fire	17 areas		• More than 200 houses were destroyed in Wajima city. • 20 houses were burned in Noto town
Road	2 section of 1 highway closed 11 sections of 3 sub-national roads closed 49 sections of 3 prefectural roads closed		
Lifeline	Water is cut off to 31,790 households	31,700	
	Power outage in 1,400 One nuclear power plant and one thermal power plant are shut down.		
Port	9 quays in 4 ports are available in Noto.		• The coastline receded due to land uplift.
Airport	Emergency restoration of runway in Noto airport completed		• ANA resumes service on 1/27 (one flight per day, Tue, Thu, Sat)

Figure 2.15 Initial assessment information from the Ishikawa Prefectural Government

2.4.4 Study Visit to Noto Peninsula Earthquake-Affected Areas

After two and half months since the occurrence of the 2024 Noto Peninsula earthquake, ADRC researchers together with six visiting researchers (VRs) visited some of the affected areas on 14-15 March 2024 to observe the following:

• Damages from the earthquake and tsunami, and the procedures for assessment

• Ongoing recovery efforts, and its challenges

On 14 March 2024 (Thursday), the team visited Suzu City, Noto Town, and Uchinada Town. On 15 March 2024 (Friday), the team visited Kaiso Fishing Port and Wajima City (Figure 2.16).

• 07:00 Kanazawa City
• 11:00 Suzu City (2 hours)
• 13:30 Noto Town (1 hour)
• 17:00 Uchinada Town (30min)
• 18:00 Kanazawa city

Route on 14 March 2024 (Thu)

• 07:00 Kanazawa City
• 09:00 Kaiso Fishing Port (30 min)
• 10:30 Wajima City (2 hours)
• 15:00 Kanazawa City

Route on 15 March 2024 (Fri)
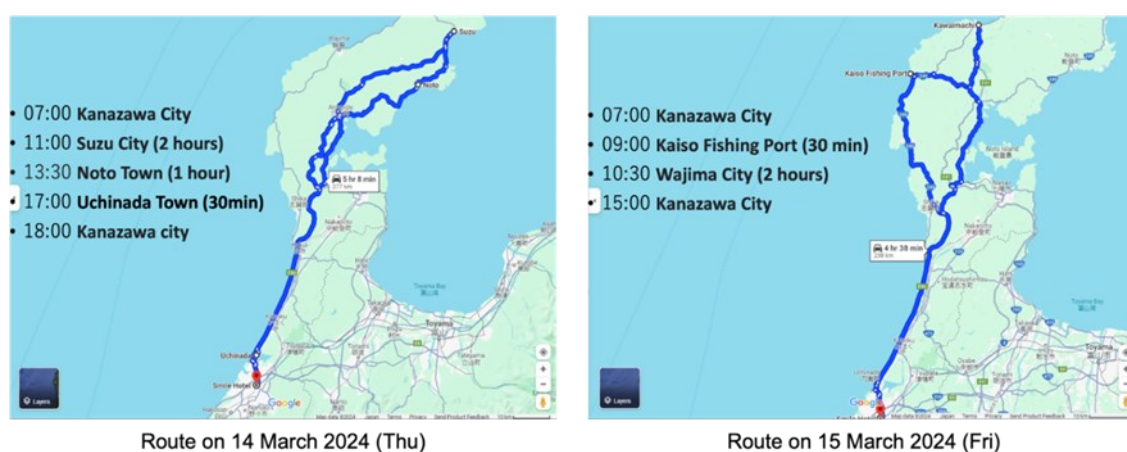
Figure 2.16 Areas visited by the team on 14 -15 March 2024

Members of the study team observed and took photos of the following: impacts of earthquakes on major infrastructures (e.g., roads, power, transport, and fishing ports), houses/buildings, and livelihoods; impacts of tsunami on properties in coastal areas; impacts of the disaster to the environment (e.g., landslide, deformation of coastal areas, and raising of seabed); impacts of liquefaction; impacts of fire following the earthquake; and debris/rubbles.

Figure 2.17 Unoccupied trailer houses in Suzu City for the support staff

The team observed that aside from transition shelters, there are also trailer houses (Figure 2.17) made for staffers to ensure the provision of continuous support to the victims.

2.5   Japan Visit to the ACE-LEDMP Middle Level

On 3-9 March 2024, ADRC organized the Study Visit to Japan component of the AHA Centre Executive Leadership in Emergency and Disaster Management Programme (ACE-LEDMP) Middle Level. This programme is aimed at enhancing ASEAN Member States' disaster management skills, focusing on strategic thinking and staying up to date with current trends.

Figure 2.18 Participants of the ACE-LEMP Middle-Level

The ACE-LEDMP has two levels (i.e., Executive and Middle) with 20 representatives participating in each cycle. The Executive Level is intended for National Disaster Management Office (NDMO) officers with 3-5 years of experience, while the Middle Level is targeted for staff with over five years of experience occupying managerial or supervisory roles. The courses for these levels have different durations. The Executive level

starts with a 3-month online course, followed by a 2-month on-site course. The Middle Level has a 1.5-month online course and a 1-month on-site course that will be held in Jakarta, Indonesia. Part of the on-site course includes one-week Study Visit to Japan (Figure 2.19).

The Study Visit is aimed to contribute in bolstering the intended competency outcomes of ACE-LEDMP Middle-level as: 1) Humanitarian and Disaster Management Expert; 2) Collaboration Builder; 3) Result-Oriented; and 4) Effective Transformational Leader. According to one of the participants,

A total of 20 middle level managers from nine ASEAN member states (AMS), each with more than five year of experience working in disaster management organizations in their country, participated in the Study Visit of this time along with 4 staff members from the AHA Centre. They received lectures from the Cabinet Office of the Government of Japan, Hyogo Prefecture, Sumida City Office in Tokyo, the International Recovery Platform (IRP) and ADRC. They also visited Koshigaya Lake Town and the Disaster Reduction and Human Renovation Institution (DRI) to deepen their understanding of Japan's disaster management policies. During the concluding session of the visit, the participants

Figure 2.19 ADRC's Approach to the ACE-LEDMP Study Visit to Japan

discussed the future promotion of further disaster reduction measures in the ASEAN region, drawing insights from the lessons learned in Japan. The Study Visit to Japan offered valuable hands-on learning experiences, fostering cultural exposure, networking opportunities, team collaboration, enhancing the appreciation of the subject matter, creating a holistic and enriching approach to disaster risk management.

3. Information Sharing on DRR

3.   Information Sharing on DRR

ADRC shares disaster risk reduction (DRR) information to member countries and the general public primarily through its website https://www.adrc.asia/latest/. Information shared online includes documented experiences, lessons, tools, practices, and analyses of data that are useful for preparedness, mitigation, response, and recovery activities.

3.1   Information Collection

Since member-countries, partner organizations, and networks maintain DRR databases, ADRC collects pertinent information for sharing, such as:

- 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 visiting researchers (VRs) and the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) greatly 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 FY 2023.

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
Negara Brunei Darussalam	2024
Kingdom of Cambodia	1998, 1999, 2002, 2003, 2005, 2006, 2013
People's Republic of China	1998, 1999, 2005, 2006, 2012
Republic of Fiji	2023
Republic of India	1998, 1999, 2002, 2005, 2006, 2008, 2012, 2015, 2018, 2020, 2022, 2023
Republic of Indonesia	1998, 1999, 2002, 2003, 2004, 2005, 2006, 2012, 2016

Country	Year prepared (Update frequency is different as it is made by VRs of the year.)
Islamic Republic of Iran	2013
Japan	1998, 1999, 2002, 2005, 2006, 2012, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023
Republic of Kazakhstan	1998, 1999, 2002, 2005, 2006
Republic of Korea (ROK)	1998, 1999, 2001, 2002, 2005, 2006, 2008
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
Republic of Maldives	2013, 2014, 2015, 2018, 2023
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
Republic of Uzbekistan	1998, 1999, 2005, 2006, 2013, 2015
Socialist Republic of Vietnam	1998, 1999, 2005, 2006, 2017, 2021, 2022, 2023
Republic of Yemen	2009, 2012, 2014

3.1.2 Latest Disaster Information (FY 2023)

As of 28 February 2024, a total of 2,658 disaster information items can be accessed on the ADRC website (Figure 3.1). Once a disaster occurs, its latest disaster information is immediately posted on the ADRC website. Each disaster information contains details such as the date of occurrence, location, impacts, and links to reports, articles, maps, relief efforts, and satellite images.

Described below are some of the notable disasters that occurred during FY 2023 which can be found in the ADRC database.

(1)   Noto Peninsula Earthquake, 1 January 2024

GLIDE number: EQ-2024-000001-JPN. A large earthquake (M7.6) occurred at 4:10 pm on January 1 in 2024. The epicenter of the earthquake was located in the northern part of Noto Peninsula. Serious damages covering the four prefectures in Hokuriku (Ishikawa, Fukui, Toyama, and Niigata prefectures) due to the earthquake were reported. Damaged caused by tsunami was approximately 160 hectares in Suzu City and Noto City. Power and water supplies were cut, and communications were disrupted. There were districts isolated due to roads cut off. Basic needs such as food, water, blankets and fuel were short in supply. Fires occurred in some cities with hundreds of houses burnt down. As of 16 February 2024, the local government confirmed 241 deaths in Ishikawa prefecture, and at least 1,296 people were injured. More than 60,614 houses were collapsed/damaged, which brought about 12,929 people remaining in 521 evacuation centers.

(2)   Earthquake in Nepal, 3 November 2023

GLIDE number: EQ-2023-000214-NPL. After the initial magnitude 6.4 earthquake that struck Karnali Province in western Nepal on 3 November, a series of aftershocks counting over 350 times further damaged homes and buildings that were already partially damaged, forcing people to sleep outside in freezing overnight temperatures. A week and a half after the earthquake, the Government and humanitarian organizations provided winterized shelter, particularly with the start of the winter season. On 15 November 2023, the National Emergency Operation Centre (NEOC) reported that approximately 62,000 homes were affected (35,455 partially and 26,557 completely damaged) by the earthquake. As part of reconstruction efforts, the Government approved and issued building guidelines for transitional shelter and will provide 50,000 Nepali Rupees (NPR) (US$375) to families with completely damaged homes.

(3)   Typhoon Mawar, 27 May 2023

GLIDE number: TC-2023-000077-PHL. Tropical cyclone Mawar (local name: Betty) resulted in 2 casualties: 1 dead and 1 injured. Reports from Ilocos Region and Cordillera Administrative Region showed that the production loss and cost of damage to agriculture amounted to PHP133,000.00, while damage to infrastructure reached PHP68,695.58. A total of 11 houses were totally damaged, while 91 were partially damaged. The passage of Betty over the Philippine Sea enhanced the Southwest Monsoon and triggered the onset of the rainy season for areas under Climate Type I. The monsoon brought heavy rains over the western portion of Southern Luzon.
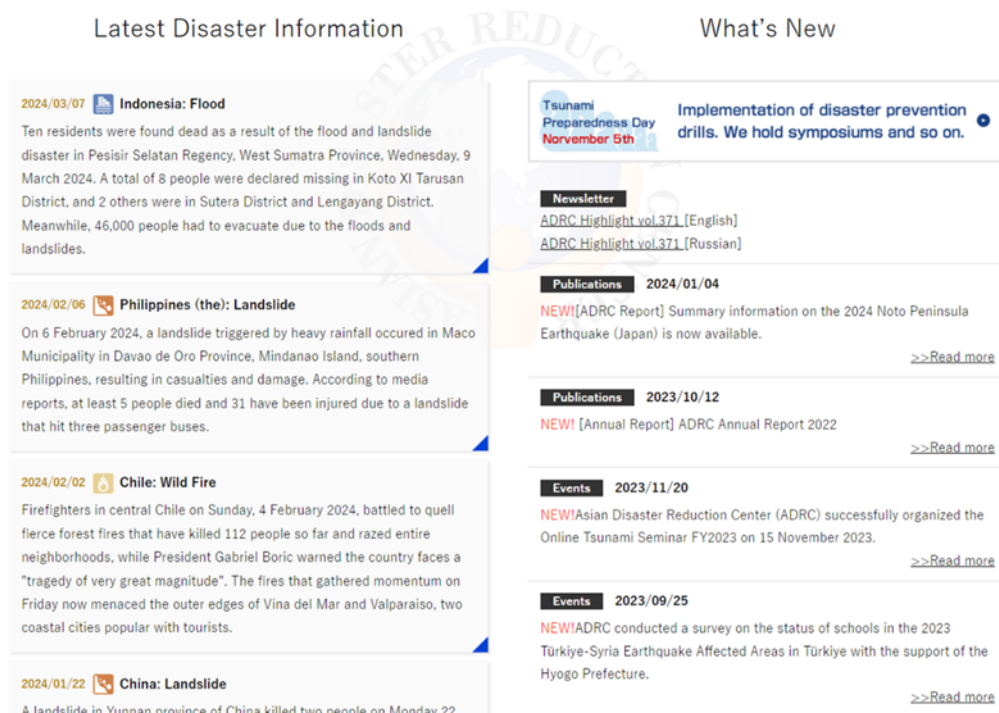
Figure 3.1 Screenshot of ADRC homepage with the latest disaster information

ADRC is able to maintain this massive disaster database due to the contribution and support from a wide range of reliable members and partners that provide the data.

3.1.3   Natural Disaster Databook 2022

ADRC publishes the Natural Disaster Databook annually to provide statistical and analytical perspectives of disaster data. For its 2022 issue, ADRC used the data from the Emergency Event Database (EM-DAT) downloaded on 16 May 2023 to analyze the number of occurrences, deaths, people affected, and economic losses from disaster events – focusing only on eight disaster types: drought, earthquake, extreme temperature, flood, landslide, storm, wildfire, and volcanic activity. Part of the analysis is made by:

- Comparing the natural disasters in 2022 with natural disasters in the last 30 years (1992-2021)

- Comparing climate-related disasters in 2022 with climate -related disasters in the last 30 years (1992-2021)

In 2022, a total of 388 disasters occurred globally. This is higher compared to the annual average for the past 30 years (1992-2021), which is 340. Although there was an increasing trend of disaster occurrence globally, a decreasing trend of disaster occurrence was observed in Asian region in 2022.
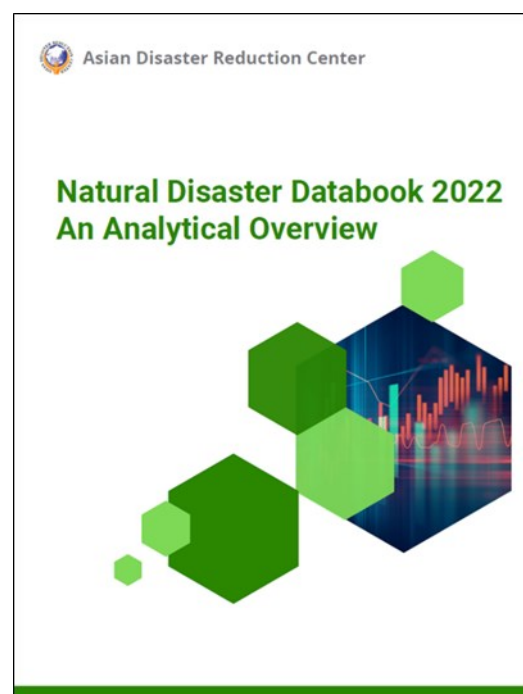
Figure 3.2 Natural Disaster Databook 2022

Likewise, the number of deaths, people affected, and the economic losses from natural disasters in Asia in 2022 were lower compared to the annual averages for the past 30 years (1992-2021). Flood and storm remain to be the frequently occurring disaster types globally and in the Asian region in 2022 and during the past 30 years. It was observed that climate-related disasters (particularly from flood, storm, and drought) account for the highest number of people affected and economic losses in 2022 and during the past 30 years.

The top 10 countries with the highest number of disaster occurrences in 2022 include Indonesia (20 events), Philippines (12), China (12), Thailand (11), Vietnam (8), Afghanistan (8), India (7), Japan (7), Malaysia (6), and Nepal (6) shown in Fig 3.3.

2022 DISASTER OCCURRENCES TOP 10 COUNTRIES IN ASIA
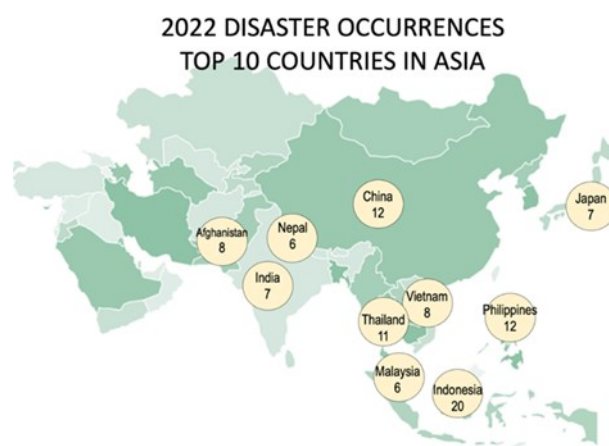
Figure 3.3 Top 10 countries with highest number of disaster occurrences in 2022

Globally, the damage caused by disasters in 2022 (USD 223.84 million) is higher than the annual average disaster damage for the past 30 years (annual average of USD 121.46 million). The situation in Asia is different, where there is a decreasing trend of disaster economic impacts in 2022 compared to the last 30 years (1992-2021). The estimated total economic impact from disasters in 2022 was USD 48.75 million, which was lower than the average annual economic impacts from disasters for the past 30 years, which was USD 52.88 million (Figure 3.4).

ECONOMIC LOSSES BY DISASTER TYPE (IN BILLION USD) (GLOBAL)

121.5B < 223.8B

	1992-2021 (30-year ave.)	2022
Wildfire	4B	1B
Storm	54B	131B
Flood	29B	45B
Earthquake	26B	12B
Drought	6B	34B

ECONOMIC LOSSES BY DISASTER TYPE (IN BILLION USD) (ASIA)

52.9B > 48.8B

	1992-2021 (30-year ave.)	2022
Storm	10.9B	3.4B
Flood	18.1B	25.5B
Earthquake	20.4B	12.1B
Drought	2.6B	7.6B
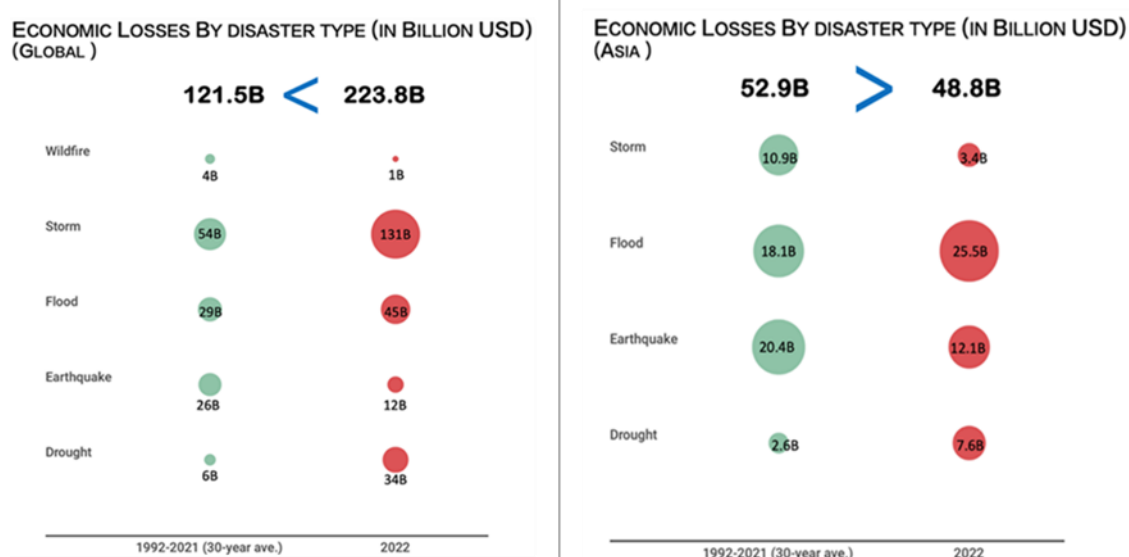
Figure 3.4 Economic losses in 2022: Global data vs. Asian data

Furthermore, the occurrence of disasters in Asia in 2022 was 137. It was lower compared to the annual average of 141 for the past 30 years. The number of deaths was also lower in 2022 at 7,750 compared to 30,909 annual average for the past 30 years. Disaster affected people in 2022 was 64.23 million, less than half of the average number of affected persons per year for the past 30 years, which was 168.81 million.

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

The newsletter "ADRC Highlights" is issued monthly and published in English, Russian and Japanese. As of 29 February 2024, the respective numbers of subscribers are 2,663, 226 and 935. Online version of the newsletters is made available on the website while the text version is shared by email to ADRC counterparts, former visiting researchers, former GLIDE researchers, and others (e.g., participants of ACDR, annual meetings, visitors to ADRC, trainees in JICA's training courses delivered by ADRC, and participants of international conferences which ADRC took part). Additionally, ADRC registers the email addresses of those who wish to subscribe the newsletter. ADRC regularly updates this mailing lists for efficient and effective dissemination to readers.

Figure 3.5 ADRC Highlights published in Japanese, English, and Russian languages

Articles in the newsletter regularly include the latest ADRC activities such as the VR program, Asian Conference on Disaster Reduction, progress of projects, reports on participation in international conferences, and other events or projects which ADRC organized.

3.2.2 Data Sharing through GLIDE Number System

As of March 2024, over 7,700 GLIDE numbers were issued to support the integration of disaster data and to inform the disaster preparedness, response, and recovery activities. GLIDE stands for "Global disaster IDEntifier". The GLIDE number system assigns a "global ID" for a disaster for all stakeholders to use in their

databases or in reporting. 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 organisations, research institutions, and governments to contribute in strengthening

Figure 3.6 Screenshot of the GLIDE Homepage

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 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.

3.2.3 Data Sharing through Sentinel Asia

Upon request from member countries, ADRC, through Sentinel Asia, facilitates the sharing of satellite images of emergency observations to help inform their disaster response and recovery plans. In FY 2023, Sentinel Asia received a total of 27 requests from the Joint Project Team (JPT) members and all 27 requests were activated (Figure 3.7). When a member country sends an emergency observation request, ADRC forwards it to eight space agencies under Sentinel Asia: ISRO (India), JAXA (Japan), MBRSC (United Arab Emirates), STI/VAST(Vietnam), GISTDA (Thailand), TASA (Taiwan), CRISP (Singapore), and PhilSA (Philippines) . Sentinel Asia

Figure 3.7 Emergency Observation requests record from 2007-2023

is a network with a wide-range of memberships. As of January 2024, the JPT membership comprises 114

organizations from 29 countries. 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.
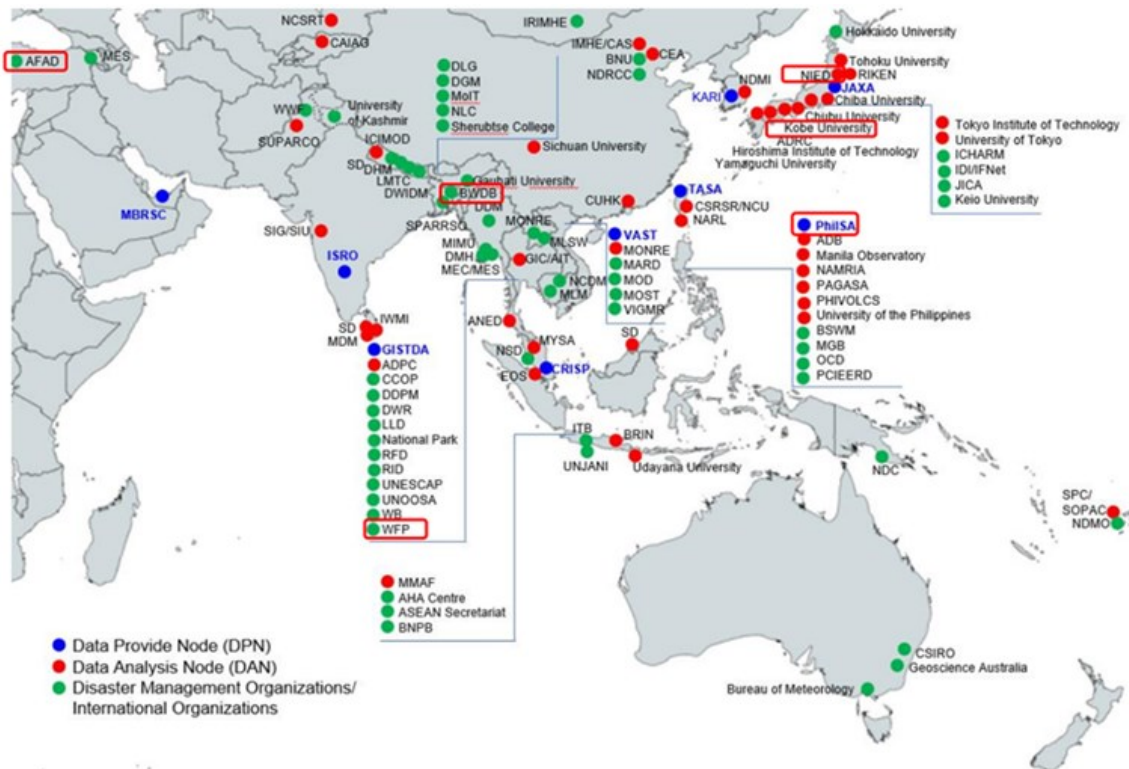
Figure 3.8 Sentinel Asia Network

4. Human Resource Development

4. Human Resource Development

ADRC enhances the DRM capacities of member countries through the visiting researchers (VR) program, seminars, workshops, training events, and other DRR related human resource development activities.

4.1 Visiting Researchers Program

As of March 2024, a cumulative total of 132 visiting researchers from 27 countries had participated in the program since it started in 1999 (Figure 4.1). This program aims at achieving the following objectives:

- To accumulate information on the latest disasters, disaster management policies, laws, plans, budget, and progress of the SFDRR of member countries to strengthen their disaster resilience;

- To compose an effective human resource development program 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 newly joined researchers.

Each year, four to six practitioners in disaster risk reduction and management visit Japan to gain greater understanding of disaster management systems of Japan and other countries as well as contribute to the implementation of the Sendai Framework for Disaster Risk Reduction in Asian countries.

This program develops human resources, strengthens disaster response capabilities, and enhances the ties between member countries and ADRC.

Country	Count
Azerbaijan	3
Armenia	9
Yemen	3
Iran	1
India	9
Indonesia	3
Uzbekistan	2
Cambodia	4
Kyrgyz	2
Sri Lanka	11
ROK	3
Thailand	12
Tajikistan	2
China	3
Türkiye	1
Nepal	9
Bangladesh	6
Pakistan	6
PNG	1
Philippines	9
Bhutan	4
Viet Nam	6
Malaysia	4
Myanmar	5
Maldives	5
Mongolia	6
Lao PDR	3
Total	**132**

Figure 4.1 Cumulative total of VRs as of March 2024

4.1.1 Activities During the Program

In FY 2023, six visiting researchers came to Japan to participate in the program. During their stay, the VRs learned about innovative and practical DRR activities and technologies as well as established greater cooperation and collaboration with other national governments, international organizations, and DRR agencies.

Section 4

Figure 4.2 VRs during one of the visits to DRR agencies in Japan

4.1.2   Research Topics

On 21 March 2024, all 6 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 titles of their respective researches were as follow:

• Azerbaijan: Flood Risk Management in Azerbaijan and Japan

• India: Integrating Disaster Risk Reduction into Urban Planning and Infrastructure Development

• Lao PDR: Strengthening Community Based Disaster Risk Management in Lao PDR through the Development of District and Community Level Disaster Risk Reduction Plan - Lessons Learned from Japan -

• Maldives: Improvement Pathways for Coordination in Disaster Response and Emergencies in Maldives

• Thailand: Disability Inclusion in Shelter Management

• Vietnam: Development of Disaster Risk Reduction Plan in Vietnam, Lessons learn from Japan

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

4.1.3   Networking of Visiting Researchers

After completing the program, the participant automatically becomes part of the network of former VRs. ADRC taps this network to cooperate in various ongoing projects for effective and efficient implementation. Additionally, VRs are tapped to design new projects that meet the local conditions. Furthermore, former VRs are contacted whenever ADRC intends to suggest policy updates or extends support to their respective 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 Online Tsunami Seminar 2023 held on 15 November 2023, two former VRs were invited as resource speakers: 1) Mr A.M.R.N.K. Alahakoon from Sri Lanka, VR in FY2019, and 2) Ms Thai Minh Huong from Vietnam, VR in FY2022. Both of these former VRs reported on their countries' tsunami disaster prevention efforts.
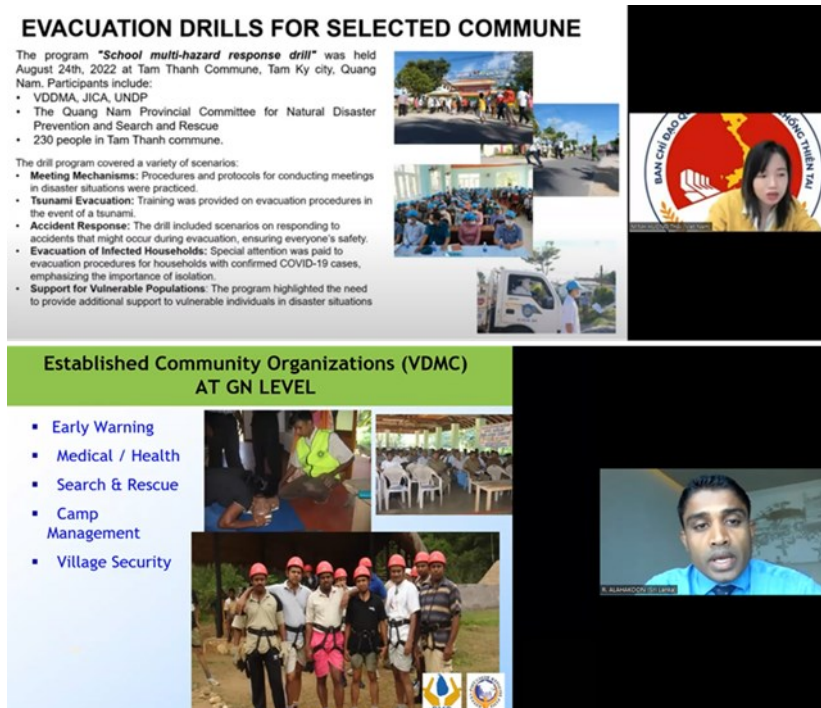
Figure 4.3 Ms Huong (up) and Mr Alahakoon (down) at the Tsunami DRR Seminar

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

4.2 JICA Knowledge Co-creation Program

Under the Knowledge Co-creation Program, JICA commissioned ADRC to conduct comprehensive training courses on DRR, which are designed based on themes of interests in each region/country. In FY 2023, ADRC implemented seven training courses: 1) Comprehensive DRR for Central and South America, 2) Enhancement of Disaster Risk Management Capacity of the National Disaster Management Agency (NADMA) of Malaysia; 3) Comprehensive DRR for Central Asia and Caucasus; 4) Promotion of Mainstreaming Disaster Risk Reduction; 5) Comprehensive Disaster Risk Reduction for the African Region; 6) Comprehensive Disaster Risk Reduction for six countries; and 7) Enhancement of DRM Capacity of NADMA Malaysia Part 2.

4.2.1 Comprehensive DRR for Central and South American Countries

Duration: 9 May – 30 June 2023

Number of Participants: 10 (from 10 countries)

Contents: DRR in Japan, 8 Steps in Formulating DRR Strategy, Site visits

In cooperation with JICA Kansai, ADRC conducted this training from 9 May to 30 June 2023. It was attended by 10 participants from 10 Central and South American countries: Colombia, Nicaragua, Peru, Argentina, Guatemala, Costa Rica, Chile, El Salvador, Ecuador, and Panama. The program consisted of 4 weeks of online and 3 weeks of face-to-face lectures and exercises to learn about Japanese experiences and technologies in disaster risk reduction. It also included site visits to Hyogo and Kumamoto prefectures to observe various countermeasures including experiences in Hyogo Prefectural Emergency Management and

Training Center, comprehensive flood control measures in Kako River and sediment disaster control in the Aso region. At the end of the course, the participants developed a draft local plan for DRR in their own countries through the 8-step workshop. After each going back to their own country, they are expected to actively engage in DRR measures to reduce humanitarian and economic losses due to disasters. ADRC would like to express its sincerest gratitude to all the organizations and universities that contributed to the success of this course.

Figure 4.4 Trainees experienced an earthquake simulation in the vehicle

4.2.2 Malaysia "LEP2.0 Enhancement of the Disaster Risk Management Capacity of the National Disaster Management Agency (NADMA)" Countermeasures against Sediment related Disaster

Duration: 10 – 21 July 2023

Number of Participants: 12 (from Malaysia)

Contents: Sediment disaster policies, DRR in Japan, Site visits

A total of twelve officials from disaster risk management and relevant organizations in Malaysia participated in this intensive two-week program, 10-21 July 2023, to learn about the sediment disaster policies and practices of Japan. Participants attended lectures by experts in the field, including from the Ministry of Land, Infrastructure, Transport and Tourism, local government and research institutes, and visited sites in Hiroshima, Nara and Osaka where sediment disaster countermeasures have been installed. At the end of the program, the participants presented their action plan based on their findings over the two weeks. With the support from JICA, ADRC collaborated with organizations and universities in Japan in carrying out this program.

Figure 4.5 Site visit to Sabo facilities in Nara Prefecture

4.2.3 Comprehensive DRR for Central Asia and Caucasus

Duration: 16 June – 8 August 2023

Number of Participants: 8 (from 5 countries)

Contents: DRR in Japan, 8 Steps in Formulating DRR Strategy, Site visits

This training on Comprehensive Disaster Risk Reduction for Central Asia and Caucasus was conducted from 16 June to 8 August 2023 in collaboration with JICA Kansai. Eight government officials from five countries: Armenia, Kazakhstan, Kyrgyz Republic, Turkmenistan, and Uzbekistan, participated in this course. Participants learned how to formulate and implement local DRR plans to promote DRR measures in their respective home countries.

The first four weeks of the course consisted of online lectures and exercises. In the latter three weeks, face-to-face programs were conducted in Japan, including site observations and lectures in Hyogo, Niigata, Gunma, and Ibaraki prefectures to learn about Japanese experiences and countermeasures of DRR. At the end of the course, the participants presented a draft of a local DRR plan, which they formulated through the programs and adapted to challenges present in their own home countries. Moreover, through active discussions and sparring on their respective DRR plans, the participants shared knowledge and addressed challenges they had in disaster reduction measures in their home regions.

Figure 4.6 Site visit to Sabo facilities along the Karasu River Basin in Gunma Prefecture

4.2.4   Promotion of Mainstreaming DRR (Group and Region focused)

Duration: 20 November – 13 December 2023

Number of Participants: 10 (from 10 countries)

Contents: DRR in Japan, 8 Steps in Formulating DRR Strategy, Site visits

ADRC conducted this training on Mainstreaming Disaster Risk Reduction from 20 November to 13 December 2023. A total of ten officials from disaster risk management organizations in the Pacific island and Asian countries participated in this program to learn about disaster management policies and measures based on the approach of the Mainstreaming Disaster Risk Reduction.

Participants attended lectures by experts from organizations in the field, including the Ministry of Land, Infrastructure, Transport and Tourism, local government and research institutes. They also visited sites in Tokyo, Gifu and Hyogo prefectures. During the program period, a total of four discussion sessions were held to exchange opinions between participants and experts. At the end of the program, the participants presented their action plan based on their findings. ADRC collaborated with JICA and other institutions in Japan in carrying out this program.

Figure 4.7 Part of the activities during the site visit to Tajimi Sabo National Highway Office

4.2.5   Comprehensive DRR for the African Region

Duration: 5 December 2023 – 29 March 2024

Number of Participants: 13 (from 12 countries)

Contents: DRR in Japan, 8 Steps in Formulating DRR Strategy, Site visits

On 5 December 2023 to 29 March 2023, ADRC conducted in hybrid format (online and in-person) the training on Comprehensive Disaster Risk Reduction for the African Region. Thirteen government officials from 12 countries: Algeria, Cote d' Ivoire, Egypt, Kenya, Liberia, Malawi, Mozambique, Senegal, Sierra Leone, South Sudan, Zimbabwe, and Cape Verde participated in the training. The course was aimed at assisting the participants to formulate and implement local DRR plans and to promote disaster risk reduction measures in their respective countries. The participants attended lectures, joined site visits and Town Watching activity. They also participated in exercises to formulate a draft local DRR plan. ADRC collaborated with JICA and other institutions in Japan in carrying out this program.

Figure 4.8 Town watching exercise facilitated by Dr Ogawa, Executive Secretary of ADRC

4.2.6 Comprehensive Disaster Risk Reduction

Duration: 19 December 2023 – 21 February 2024

Number of Participants: 6 (from 6 countries)

Contents: DRR in Japan, 8 Steps in Formulating DRR Strategy, Site visits

ADRC conducted this training on Comprehensive Disaster Risk Reduction from 19 December 2023 to 21 February 2024 in cooperation with JICA Kansai. Six government officials from six countries: Algeria, Bangladesh, Brazil, Indonesia, Pakistan, Sri Lanka, participated in this course. Participants learned how to formulate and implement local disaster risk reduction (DRR) plans to promote DRR measures in each country. It was conducted in a hybrid format, where participants attended online programs before coming to Japan for the in-person program. In the six-week program in Japan, the participants attended site visits and lectures in disaster-related organizations/facilities in Hyogo, Osaka, Kyoto, Kumamoto, and Hiroshima prefectures to learn about Japanese experiences and countermeasures of DRR. Furthermore, they exchanged information and opinions on each country's budget situation and inter-organizational cooperation to promote DRR. At the end of the course, they presented a draft local DRR plan, which they formulated through the programs.
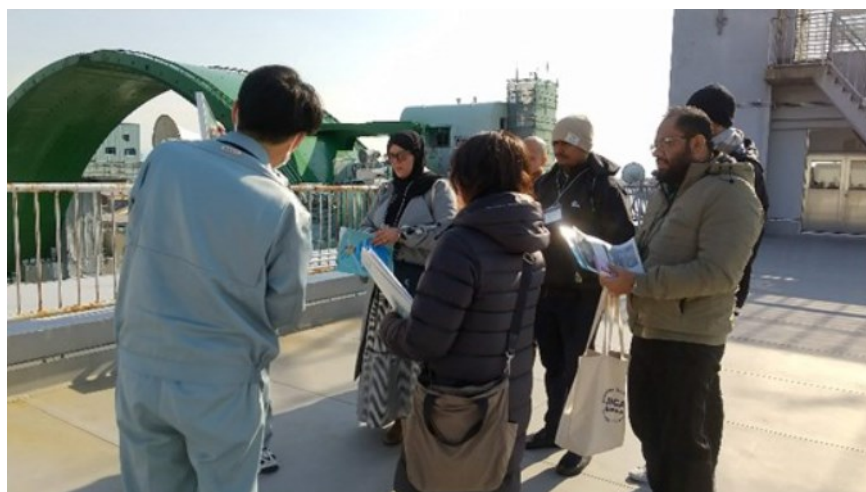
Figure 4.9 Site visit to Kizugawa Floodgate, Osaka Prefecture

4.2.7 Malaysia "LEP2.0 Enhancement of the Disaster Risk Management Capacity of the National Disaster Management Agency (NADMA): Countermeasures against Flood Control"

Duration: 26 February – 8 March 6 2024

Number of Participants: 15 (from Malaysia)

Contents: Flood control policies, Site visits

A total of 15 officials from disaster risk management and relevant organizations in Malaysia participated in this intensive two-week program, 26 February – 8 March 2024, to learn about the flood control policies and practices of Japan.

Figure 4.10 Site visit to flood countermeasure infrastructure

Participants attended lectures by experts in the field, including from the Ministry of Land, Infrastructure, Transport and Tourism, local government and research institutes, and visited sites in Hiroshima, Tokyo, and Kanagawa where countermeasures have been installed. At the end of the program, the participants presented their action plan based on their findings over the two weeks. With the support from JICA, ADRC collaborated with organizations and universities in Japan in carrying out this program.

4.3   Online Tsunami Seminar Series

ADRC organized the Online Tsunami Seminar in FY 2023 to share the latest research findings and practices on tsunami disaster risk reduction to member countries, stakeholders, and the general public. Specific objectives were to: 1) share community-based tsunami preparedness programmes and activities (e.g., initiatives related to awareness-raising, evacuation drill, and early warning systems); and 2) discuss challenges in implementing community-based tsunami preparedness activities. The discussions provided insights to strengthen community-based tsunami preparedness activities. It also highlighted new approaches of addressing the common challenges in community-based tsunami preparedness programs.

Figure 4.11 Resource speakers of the Online Tsunami Seminar 2023

Each speaker highlighted the practices and experiences of their respective countries. Ms Thai Minh Huong noted that tsunami disaster-preparedness in Vietnam is a proactive approach, stressing that "although there was no prior tsunami experience in Vietnam, it does not mean it will not occur." In the same light, the government is facing a challenge to convince communities in areas where tsunami may occur to actively participate in the preparedness programs. Mr A.M.R.N.K. Alahakoon said that some coastal communities in Sri Lanka were impacted by the Indian Ocean Tsunami of 2004. With that experience, the government has been implementing a tsunami preparedness program, including the establishment of the community organizations (VDMC). However, VDMCs do not have any "legal status", therefore the government could not provide them financial support. One lesson from this experience is that "top-down" approach with no legal fund transfer could be challenging. Dr NAKANO Genta reported that the through past tsunami experiences, the community-based preparedness efforts in Japan have evolved to a more "collaborative model". He showcased the experience of Okitsu community in Shimanto Town of Kochi Prefecture with the following collaborators tasks: 1) volunteer organization to facilitate linkage among the school, municipality, and experts; 2) elementary school to educate the children to protect themselves from tsunamis; 3) town government to implement infrastructure improvements; and 4) university to provide specialized information on earthquake and tsunami disaster.

4.4 Short-Term Programmes

ADRC has been conducting short-term trainings for promoting DRR. In FY2023, ADRC organized several short-term programs targeted at government officials, academics, and students from overseas and Japan.

4.4.1 DDPM Visit

On 17-21 May 2023, ADRC welcomed the delegation from the Department of Disaster Prevention and Mitigation (DDPM), Thailand visited Japan to conduct the "Study Visit Program for Enhancing the Capacity of a National Early Warning System and Establishing Cell Broadcast System in Thailand." The delegation included Mr Boontham Lertsukekasem, Director General of DDPM, and 11 other senior officials who are in charge of early warning system and dissemination in the department. The group visited some organizations involved in the river early warning and information dissemination system including: the Kanto Regional

Development Bureau's Kofu Work Office under the Ministry of Land, Infrastructure, Transport and Tourism (MLIT); the Fire and Disaster Management Agency (FDMA) under the Ministry of Internal Affairs and Communications (MIC); the Sumida City Office; the Japan Broadcasting Corporation (NHK); NTT Docomo; the Japan Telecommunications Engineering and Consulting Service (JTEC); and the Honjo Life Safety Learning Center. The visits gave the group an opportunity to obtain directly from the respective organizations a wide perspective of the latest initiatives taken in Japan concerning the river early warning system ranging from the acquisition of river observation data to information dissemination to the public through the dissemination system utilized by the emergency response agencies such as FDMA and local governments, and by the media and mobile phone companies.

Figure 4.12 Visits to Kofu Office, Kanto RBD, MLIT (left) and Sumida Office (right)

ADRC supported the delegation by advising on the development of its agenda and by accompanying the delegation to the study visits.

4.4.2   NIT Wakayama College

On 16 August, ADRC received a student and a teacher from the National Institute of Technology, Wakayama College. The student wished to study in the Philippines, and ADRC provided a briefing on the country's risk profile, past disasters, and disaster risk management systems. The briefing included discussions on the characteristics of damage, administrative systems, NGO activities, disaster information dissemination such as SNS, disaster awareness of local residents and points of reference for disaster management in Japan. The student raised questions about the educational environment in the Philippines and the mutual understanding of communities. The visitors were particularly interested to know more information about local disaster management systems as well as the activities of non-governmental organizations (NGOs).

4.4.3   Atma Jaya Yogyakarta University

On 14 November, ADRC hosted the visit of Atma Jaya Yogyakarta University in Indonesia and gave a lecture on ADRC's contribution in building resilience in Asian countries. The lecture introduced examples of ADRC activities including information sharing, technology transfer and the latest early warning technologies useful at the community level.

Figure 4.13 ED Sasahara delivered a lecture (left) and group photo of participants (right)

Participants asked many questions such as: "Why was the Kanto Earthquake in 1923 dominated by huge fire?" "How does ADRC promote sustainability of projects in the community?" "Does ADRC have projects related to Climate Change?" Staffers from ADRC answered the questions, and lively discussions followed.

4.4.4   Internships at ADRC

ADRC accepted a total of three interns in FY 2023. This is part of ADRC's continuing program of supporting students who are interested in learning more about disaster risk reduction, particularly in the Asian context. During the period of internship, students are given opportunity to support the implementation of projects undertaken by researchers (e.g., Annual Report, Natural Disaster Databook, Country Risk Profiles, GLIDE, Disaster Information Management, and latest disaster information). Interns also participate in ADRC activities, e.g., the Asian Conference on Disaster Risk Reduction (ACDR), Town-watching exercises, Tsunami DRR seminars, DRR workshops, and field visits. Interns in 2023 were from the Philippines and Denmark (Figure 4.14).
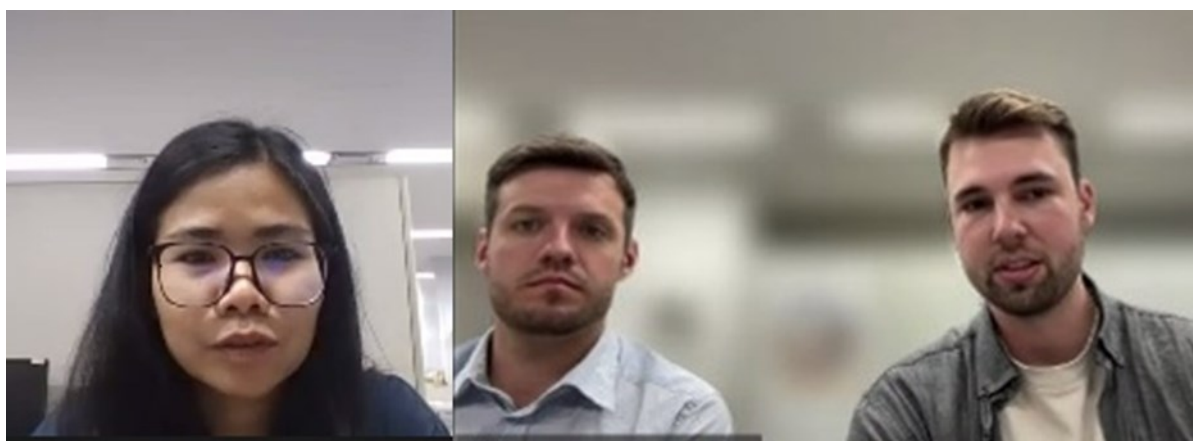
Figure 4.14 Interns of 2023: Ms De Chavez, Mr Creton, and Mr Svensson

(1)   Ms Hazel De Chavez (Philippines)

Affiliation: International University of Japan (Masters in Public Management)

Period of internship: 2 – 28 July 2023

Tasks: Write-up for Natural Disaster Databook 2022, editing of the ADRC Annual Report 2022, Write-up on good practices about flood and typhoon countermeasures in the Philippines

(2)   Mr Oliver Creton (Denmark)

Affiliation: Roskilde University, Denmark (Masters in Global Studies)

Period of internship: 4 September – 27 October 2023

Tasks: Updating of profiles of ADRC member countries, updating of the report on Türkiye-Syria Earthquakes, GLIDE utilization analysis, documentation of the ACDR2023

(3)   Mr Rasmus Svensson (Denmark)

Affiliation: Roskilde University, Denmark (Masters in Global Studies)

Period of internship: 4 September – 27 October 2023

Tasks: Updating of profiles of ADRC member countries, updating of the report on Türkiye-Syria Earthquakes, GLIDE utilization analysis, documentation of the ACDR2023

5. Cooperation and Partnerships

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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

In FY 2023, much progress was made in the research projects pertaining to QZSS, Climate Change Impact Projection Study (SENTAN4), and Economic Research Institute for ASEAN and East Asia (ERIA).

5.1.1   QZSS DC Report Demonstrations

In collaboration with the National Space Policy Secretariat of the Cabinet Office Japan, NTT Data Corporation, and Asia Air Survey, the ADRC was engaged implementing the demonstration of the prototype receivers for the QZSS DC Report (Figure 5.1) in Malaysia, Indonesia, Bangladesh, Nepal, Philippines, and Cambodia in FY 2023.
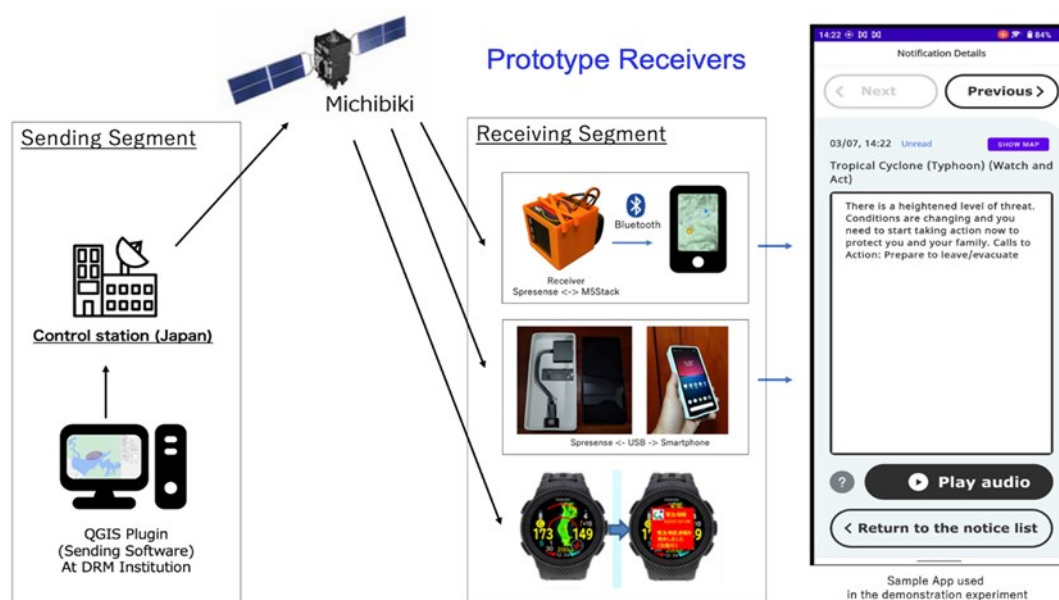
Figure 5.1 Prototype receivers for QZSS DC Report

The disaster and crisis report or "DC Report" is an early warning message dissemination service using Japan's "Michibiki" satellite system, otherwise known as the "Quasi-Zenith Satellites System" (QZSS). Under this service (which covers Asia-Pacific region), communities-at-risk can receive the warning message in near real-time in audio, text, and maps on portable terminals (e.g., smart phone or watch) or in loud speakers, electronic boards, or sirens on stationary terminals (e.g., community broadcasting device) to facilitate evacuation.

To send the warning message to the QZSS, the warning agency (e.g., Japan Meteorological Agency) can use a plugin called QGIS, which is accessible on the web for free. To receive the message from the QZSS, a receiver needs to be integrated in portable terminals (e.g., mobile phone or smart watch) or stationary terminal (e.g., broadcasting device).

The dates and the types of hazards that each country adopted for the QZSS DC Report demonstration are summarized in Figure 5.2. Generally, the most common issues for disseminating early warning message in these countries are: 1) warning message is not targeted to specific at-risk-population, and often sent to population who are not at-risk causing panic; 2) warning message is usually one-way communication, and no feedback whether communities-at-risk successfully evacuated; and 3) warning agencies maintain their own separate databases that needs to be integrated to achieve reliable forecast and warning.

Malaysia
21-24 Aug 2023
Flood & Landslide

Nepal
25-28 Nov 2023
Earthquake

Indonesia
2-6 Oct 2023
Floods & Volcanic Eruption

Philippines
11-16 Dec 2023
Typhoon

Bangladesh
1-5 Nov 2023
Cyclone

Cambodia
12-16 Feb 2024
Storm Surge

Figure 5.2 Basic Information of QZSS DC Report Demonstration in Six Countries

After the demonstrations, it was found that the QZSS DC Report service can augment the existing early warning systems of the six countries due the following contributions:

- QZSS DC Report service transmits the warning message to communities-at-risk even when the ground communication system is disrupted

- QZSS DC Report service transmits the warning message immediately, without delay and without passing through many channels

- QZSS DC Report service transmits the warning message only to the targeted area or specified communities-at-risk

- QZSS DC Report service can transmit the warning message to areas that have limited network coverage (e.g., no internet or cellular networks) such as mountainous region or island communities

5.1.2   Climate Change Impact Projection Study

ADRC, together with over 120 researchers and 43 cooperating organizations, is engaged in the SENTAN 4 Project, "Development of Hazard Integrated Prediction Model" (i.e., multi-hazard model for storm and flood, http://www.climate.dpri.kyoto-u.ac.jp/sentan4/?p=224). Under this project, the researchers aim to assess the future impacts of climate change, particularly, to water-related disasters (e.g., storm and flood), by analyzing historical and current data as well as through climate downscaling techniques and applications. Additionally, social trends and technological innovation information are also analyzed to update policy. ADRC shares the products/outcomes of the study to improve climate change literacy among DRR practitioners, researchers, and engineers as well as inform policy updates.

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

In collaboration with the additional members of the Advanced Study of Climate Change Projection (SENTAN) Program, ADRC co-organized the first webinar on "Climate Change Impact Projection for Disaster Risk Reduction in Asia-Pacific Region" on 28 August 2023. The first webinar featured the climate change impact in Fiji with the presentation from Mr Jasneel Chandra, Scientific Officer in Climatology at Fiji Meteorological Service (FMS). Mr Jasneel Chandra reported that the sea level at Lautoka Wharf in Fiji has been on average increasing at 4.3mm/year between 1993 and 2022. As result, some villages (e.g., Veivatuloa and Vunidogoloa) are easily flooded and inundated by sea water causing the relocation of many coastal houses. Since one of the objectives of the webinar was to share the results of climate change projections, the following Japanese experts also made presentations related to climate change in Fiji: 1) Prof. MORI Nobuhito, Research Division of Atmospheric and Hydrospheric Disasters, Disaster Prevention Research Institute, Kyoto University; 2) Dr NAKAEGAWA Toshiyuki, Head of Second Laboratory, Department of Applied Meteorology Research, Meteorological Research Institute (MRI) of Japan Meteorological Agency; 3) Dr MURATA Akihiko, Head First Laboratory, Department of Applied Meteorology Research, Meteorological Research Institute (MRI) of Japan Meteorological Agency; 4) Mr MORI Noriyuki, Deputy Director, International Center for Water Hazard and Risk Management; and 5) Prof. TACHIKAWA Yasuto, Hydrology and Water Resources Research Laboratory, Kyoto University.
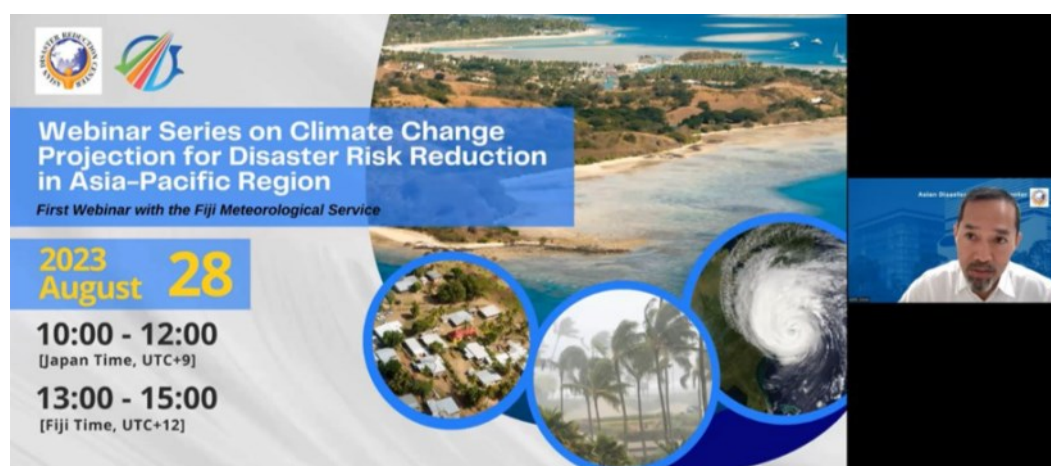
Figure 5.3 Screenshot of the 1st Webinar Series

Associate Professor KOBAYASHI Kenichiro (Kobe University) and Dr Gerald Potutan (ADRC) co-facilitated the event.

(2)   Webinar Series on Climate Change Impact Projection for DRR with Nepal

The second webinar series on climate change projection for disaster risk reduction in Asia-Pacific region was held on 10 January 2024. This webinar highlighted the results of projection study held in Nepal and the utilization of climate change-related data. The Advanced Study of Climate Change Projection (SENTAN) Project invited two experts from Nepal to the webinar to share their information and experiences. Prof. Binaya Kumar Mishra, School of Engineering at Pokhara University, presented the projected changes in flood frequency at Bagmati River in Nepal. The Bagmati river basin, located at the upstream of Khokana, covers the Kathmandu valley which in recent years has been experiencing devasting flood events. In view of this, Pokhara University set up the Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS) to

assess the change in flood discharge under climate change scenarios. Very high-resolution of Non-Hydrostatic Regional Climate Model (NHRCM) precipitation outputs was used to assess the future flood risks in the Kathmandu valley. The major results found in this study were: 1) greater precipitation extremes were found for the Regional Climate Model (RCM) precipitation output; and 2) the increase in precipitation extremes for future climate condition indicates greater flood risks in Kathmandu valley.

Ms Bibhuti Pokharel, Chief of Climate Section, Department of Hydrology and Meteorology (DHM) of the Government of Nepal, presented the Climate Service Information that DHM provides. She mentioned that DHM monitors the precipitation and temperature in Nepal to inform imminent droughts, heat waves, and extreme events. The climate data, produced by DHM, is utilized for climate projections as well as to inform the national master plan and policy on climate change. Moreover, the climate service information is provided to the following sectors: aviation, agriculture, water, energy, health, and disaster risk reduction (DRR). However, there are limitations and gaps of the climate information service.
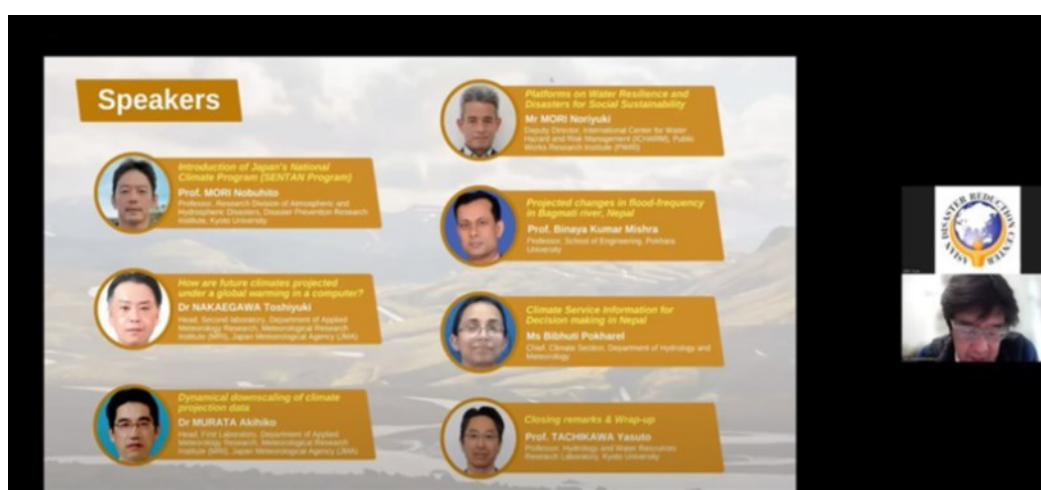
Figure 5.4 Screenshot of the 2nd Webinar Series

Ms Pokharel said that the quality of climate information was not high due to some limitations in research capacity and infrastructure. For instance, while DHM currently utilizes statistical downscaling, it has no capacity to utilize dynamical downscaling. Therefore, the assistance of partners such as SENTAN is believe to augment DHM's capacity.

Other speakers at the webinar were: (1) Prof. MORI Nobuhito, Research Division of Atmospheric and Hydrospheric Disasters, Disaster Prevention Research Institute, Kyoto University, who introduced Japan's National Climate Program or SENTAN; (2) Dr NAKAEGAWA Toshiyuki, Head of Second Laboratory, Department of Applied Meteorology Research, Meteorological Research Institute of Japan Meteorological Agency, who showed how future climates are projected in a computer; (3) Dr MURATA Akihiko, Head First Laboratory, Department of Applied Meteorology Research, Meteorological Research Institute of Japan Meteorological Agency, who presented the dynamical downscaling of climate projection data; (4) Mr MORI Noriyuki, Deputy Director, International Center for Water Hazard and Risk Management, who presented on the Platforms on Water Resilience and Disasters for Social Sustainability; and (5) Prof. TACHIKAWA Yasuto, Hydrology and Water Resources Research Laboratory, Kyoto University, who explained about the key points raised at the webinar and encouraged further collaboration between SENTAN Project and DHM Nepal.

This webinar was co-facilitated by Prof. KOBAYASHI Kenichiro, Associate Professor at the Risk Communication Research Department, Security Research Communication Group, Research Center for Urban Safety and Security in Kobe University and Mr Gerald Potutan, Senior Researcher at Asian Disaster Reduction Center (ADRC).

5.1.3 ASEAN Project

The year 2023 marked the 50th commemorative year of ASEAN-Japan Friendship and Cooperation. Considering this, the following activities were undertaken to promote concrete cooperation with ASEAN in the areas of disaster information and strengthening local disaster management capacity, to give concrete shape to the ASEAN-Japan Work Plan on Disaster Management agreed in October 2022, and to contribute to the deployment of Japanese good practices and utilization of DRR technologies.

Based on information obtained from discussions with stakeholders in Malaysia, the activities in the "Community Disaster Prevention and Response Using ICT Tools" project proposal were finalized. The "Capacity Building on DRR Information through GLIDE" project was also finalized based on input from the AHA Centre and other stakeholders. The concept notes for each project were circulated to ASEAN member states for their approval.

5.1.4 Pilot Project on Utilization of ICT for CBDRM in Malaysia

As a project to promote the "Capacity Building on Community-Based Disaster Risk Reduction (CBDRR)" programme under the ASEAN-JAPAN Work Plan on Disaster Management, ADRC has been conducting since July 2023, the "Pilot Project on Utilization of State-of-the-Art Communication Technologies for CBDRM and Disaster Emergency Management in Malaysia," commissioned by the Cabinet Office of Japan. The pilot activities were carried out in close cooperation with the National Disaster Management Agency of Malaysia (NADMA).

(1)   Test Run of the ICT Tools

After the initial coordination in July 2023 with the relevant stakeholders, such as Ranau District Office, Dumpiring and Mesilou Village Disaster Management Committees in the selected pilot area in Kundasang, Sabah, a test of the ICT tools prepared for this pilot project was conducted on 5 October 2023. The activities were conducted as one of the programmes during the Science and Technology Disaster Risk Reduction and Resilience (STDR3) Week 2023, which was attended by Datuk Armizan Mohd Ali, Minister in the Prime Minister's Department.

Figure 5.5 Explanation of the ICT Tools for CBDRM

The tools were tested and validated through simulated activities in a controlled disaster scenario involving targeted groups of community members and agencies in the pilot areas, confirming that they can be used effectively for information sharing in the event of a disaster. The results of the simulation were reviewed after the event by the observed agencies, such as NADMA and the Sabah State Disaster Management Committee

(SSDMC). Follow-up activities, including of a seminar for the district officers, will be conducted in December 2023.

(2)   Review Meeting

On 4 and 5 December 2023, ADRC organized the review meetings with the target communities, and district and state governments to evaluate the simulation of ICT tools prepared for the pilot project for CBDRM that was held in October. Most stakeholders responded very positively to the tools and agreed to work with us in the future, recognizing that the tools have the potential to revolutionize disaster response and to enhance disaster management capacity at the local level. The meeting to report the outcomes of the project to the ASEAN member states was held in February 2024.

Figure 5.6 Review meeting at Ranau District Office, Sabah State, Malaysia

5.2   International Engagements and Partnerships

In FY 2022, 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

ADRC continues to serve as co-chair of the Asia Pacific Economic Cooperation - Emergency Preparedness Working Group (APEC-EPWG), and in FY 2023, organized and participated in the following activities:

(1)   19th APEC Emergency Preparedness Working Group (EPWG) Meeting,

The Federal Emergency Management Agency (FEMA) hosted the 19th Asia-Pacific Economic Cooperation (APEC) Emergency Preparedness Working Group (EPWG-19) meeting in Seattle, USA on 1 August 2023. ADRC Project Director Mr SUZUKI Koji (Co-chair of EPWG) and Senior Researcher Mr Gerald Potutan (Assistant to the EPWG Co-chair) participated in the meeting.

 In this meeting, the member economies together with representatives from the private sector, academia

Figure 5.7 Co-chair PD Suzuki co-facilitated the meeting

and industry leaders discussed the impact of complex emergencies and disaster shocks to APEC region's supply chains and explored ways to promote DRR in supply chain management. The meeting also dwelt into diverse approaches to early warning systems in the APEC region to accelerate the implementation of robust early warning systems that strengthen risk management and advance DRR for all. It was mentioned that the key criterion to an effective early warning system was a communication system including timely and accurate dissemination of warnings that reaches the rural communities

EPWG Co-chair Suzuki, who facilitated the afternoon sessions, announced the following: i) Endorsement of the EPWG Work Plan 2023, ii) Revision of APEC DRR Framework, and iii) Revision of the Plan of Action on APEC DRR Framework. He also stated that the terms of office of the current EPWG co-chairs will end on 31 December 2023. So, the Secretariat will be starting the process for nomination of the next co-chairs.

(2)   16th Senior Disaster Management Officials Forum (SDMOF15)

In the 16th Senior Disaster Management Officials' Forum (SDMOF-16), FEMA Administrator Ms Deanne Criswell served as Chair of the Forum that was held in Seattle on 2 August 2023. This meeting was organized under the backdrop of a string of costly wildfires, floods, hurricanes, typhoons and earthquakes that compelled APEC member economies to heightened collective actions to respond to the increasingly complex disaster landscape.

Kicking off the Forum was a Roundtable on Adaptive Management, where every Minister or Head of Delegation provided a 3-minute remarks. In this roundtable, Mr TANI Koichi (Minister of State for Disaster Management) of the Japan Economy delivered video message. His message touched on incorporating the principles of adaptability, flexibility and meaningful change to build strong and resilient communities. All head of delegations to Forum provided their remarks in persons, including from the following economies: Australia, Canada, Chile, China, Indonesia, ROK, Malaysia, New Zealand, Peru, Philippines, Chinese Taipei, Thailand, USA, and Vietnam.

Emphasizing the significant role of disaster risk managers, the SDMOF tackled four thematic areas to take urgent and decisive action: i) Inclusive and Participatory Disaster Risk Reduction: Fostering Whole Community Integration into Decision-Making Processes; ii) Climate Impacts to Disaster Housing: Prioritizing Pre-Disaster Recovery Planning in Asia-Pacific; iii) Nature-Based Solutions: Strengthening Infrastructure Resilience; and iv) Women's Leadership in Crisis Management: Achieving an Equitable Future for the APEC Region.

Mr Gerald Potutan (Senior Researcher at ADRC), who moderated thematic session 2, stated the following at the wrap-up "As you heard from the speakers, the greatest challenge in disaster housing is logistics e.g., seeking permits where and when to build disaster housing, adhering to protocols in shipping building materials, and complying to government regulations in transferring funds. These logistical challenges make disaster housing complex, and it will take a long time to complete the housing reconstruction. The

Figure 5.8 Mr Potutan of ADRC moderating the session

longer it takes, the greater the losses. However, these logistical issues can be addressed now through pre-agreements and pre-disaster recovery planning. So, when disaster strikes, the pre-agreed logistical arrangements will be activated."

(3)   APEC-USA Disaster Risk Reduction (DRR) Talk

Upon invitation of FEMA, Mr Gerald Potutan (Senior Researcher of ADRC) participated as panelist in the Online DRR Talk on the theme, "APEC in an Increasingly Complex Disaster Landscape: Preparing Asia-Pacific Economies for Extreme Conditions" on the 27 June 2023. The panel tackled concerns of extreme weather events and the widespread impacts of climate change to communities across the Asia-Pacific region. At the outset, all panelists recognized the contributions of the APEC DRR Framework in advancing climate resilience through shared-interventions, such as better risk mapping strategies, expanded regional/global investment in early warning systems, innovation in resilient infrastructure, and nature-based solutions.

ADRC shared related activities, including: the advanced climate change impact projection study, the GLIDE number system, and the training program on "developing local DRR strategies" where information on emerging climate risks are integrated. ADRC also mentioned some initiatives in Japan that the government, the private sector, and the communities are promoting to proactively adapt to climate change risks. Among those mentioned were: 1) Japan International Public-Private Association for Disaster Risk Reduction (JIPAD), where private companies

Figure 5.9 Mr Potutan of ADRC serving as resource speaker

promote their DRR/CCA (Climate Change Adaptation) technologies; 2) National Resilience Promotion, an initiative that contributes in preventing and mitigating disasters; 3) Joint Strategy between the Ministry of State for Disaster Management and Ministry of Environment to mainstream synergy between Climate Action and DRR; 4) Amendments of Basic Countermeasures Act highlighting the importance of the Local Disaster Management Plans to reflect lessons from local conditions in updating the policies related to DRR-CCA; and 5) Public-Private Partnerships in promoting innovative early warning tools (e.g., SPECTEE that utilizes artificial intelligences or "AI").

All these initiatives are aimed at enhancing synergy (minimizing silos among related agencies) in implementing large-scale disaster countermeasures; providing practical knowledge and skills of people at the community level; and applying new tools and technologies to proactively reduce disaster risks as well as adapt to the emerging climate risks.

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 as well as participate in related activities.
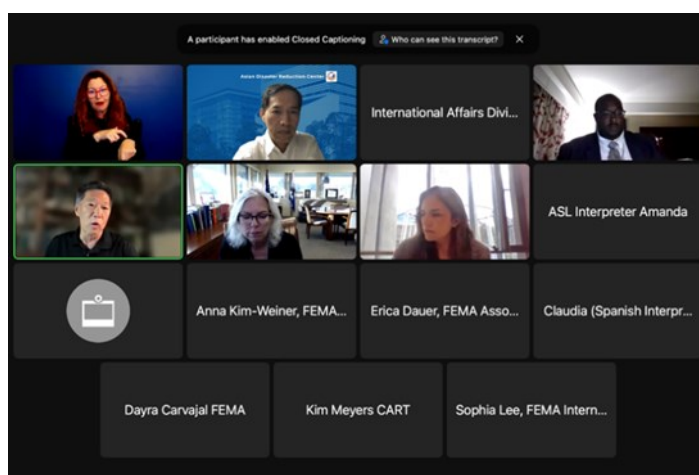
(1)   Participation in the 22nd Steering Committee Meeting of Sentinel Asia

ADRC attended the meeting of the 22nd Sentinel Asia Steering Committee held at TASA (Taiwan Space Agency) in Taiwan, on 30-31 January 2024. The meeting was attended by Japan Aerospace Exploration Agency (JAXA), which serves as the secretariat of the Sentinel Asia Joint Project Team, other space agencies in Asia, and image analysis organizations. ADRC participated to facilitate between these organizations.

At the meeting, JAXA started out by explaining the purpose of the meeting and the current status of Sentinel Asia operations and issues. In addition, the space agencies reported on their current status of operations. The Asian Institute of Technology (AIT) and Yamaguchi University had a presentation on the topics related to image analysis. ADRC reported on the status of cooperation with the United Nations Office for Disaster Risk Reduction

Figure 5.10 Group photo of participants

(UNDRR) and other organizations, as well as on the activities of the Sentinel Asia workshops held in Türkiye and Nepal in 2023. Finally, a discussion was held on the revision of the Sentinel Asia Strategic Plan based on the presentations by each organization.

(2)   8th Joint Project Team Meeting (JPTM) and 29th Session of the Asia-Pacific Regional Space Agency Forum (APRSAF-29)

The 8th Joint Project Team Meeting was held from 17 to 18 September 2023 in Jakarta, Indonesia as well as the 29th Session of the Asia-Pacific Regional Space Agency Forum (APRSAF) held from 19 to 22 September 2023 following JPTM. APRSAF was co-organized by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan, the Japan Aerospace Exploration Agency (JAXA), and the National Research and Innovation Agency (BRIN) of Indonesia.

ADRC participated in both conferences, and reported on Sentinel Asia's activities. On 17 September, ADRC participated in a panel discussion and reported on the situations of Sentinel Asia's emergency observation requests (EOR) and end-user feedbacks on the various data provided to them in time of disaster. On 18 September, ADRC joined the organization reports session and introduced

Figure 5.11 Dr Tatebe of ADRC delivering a presentation

about the Standard Operation Procedure (SOP) which is an EOR manual being developed in member countries and region of Sentinel Asia.

5.2.3   UNDRR/APP-DRR

ADRC continues to engage in 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 FY 2023, ADRC participated in the in APP-DRR activities.

(1)   Asia-Pacific Partnership on Disaster Risk Reduction Forum

On 20 September 2023, the Asia-Pacific Partnership on Disaster Risk Reduction (APP-DRR) Forum was convened to discuss the Asia-Pacific Ministerial Conference on Disaster Risk Reduction (APMCDRR) to be held in Manila, Philippines in October 2024. As the first regional platform since the adoption of the Political Declaration of the Midterm Review of the SFDRR 2015-2030, the APMCDRR 2024 will be organized under the theme: Eyes set on 2030: Asia-Pacific united to accelerate disaster risk reduction. The overall theme of the APMCDRR 2024 will focus on capturing and sharing lessons learned, identifying innovative ideas and practices to reduce systemic risk and cascading impacts, and advancing climate and disaster resilience and risk-inform development and humanitarian response preparedness, including anticipatory action

Figure 5.12 Agenda of APP-DRR Forum

and early warning systems, across the Asia-Pacific region. As Asia-Pacific is the most disaster-prone region in the world, with Sustainable Development Goals achievement under serious threat, the conference provides an important opportunity to share experiences and best practices to accelerate the implementation of the Sendai Framework. Built on the findings and recommendations of the Sendai Framework Midterm Review and the deliberations of the United Nations General Assembly High-level Meeting held on 18-19 May 2023 and the Political Declaration and its policy directives, the APMCDRR 2024 sessions will be organised around three main pillars and four cross-cutting themes, which will inform the content of the conference programme with: 3 Main Pillars and 4 Crosscutting Enablers.

5.2.4   ESCAP/WMO: Typhoon Committee

Under the auspices of the Cabinet Office Government of Japan, ADRC has been engaged in the activities of the ESCAP/WMO Typhoon Committee. ADRC participated in the following Typhoon Committee-related activities in FY 2023.

(1)   56th Session of the Typhoon Committee (TC-56)

Marking the first in-person Session following the global COVID-19 pandemic, the Fifty-Sixth Session of the Typhoon Committee (TC-56) was held in Swiss-Garden Hotel Bukit Bintang, Kuala Lumpur, Malaysia from 27 February to 1 March 2024. The Typhoon Committee, under the auspices of the United Nations Economic and

Social Commission for Asia and the Pacific (UNESCAP) and the World Meteorological Organization (WMO), convened the Session and hosted by the Malaysian Meteorological Department.

In the 56th Session reviewed the progress made in its programme of work in 2023 and planned the activities to be undertaken in 2024 and beyond, together with the support required to implement them. The Session also covered the strategic and development issues such as the implementation of the updated Strategic Plan 2022-2026. ADRC made a presentation to promote the use of the QZSS (Quasi-Zenith Satellite System) for early warning systems in each country and GLIDE numbers for disaster information

Figure 5.13 Group Photo at TC-56 Session

sharing. Since the Working Group on Disaster Risk Reduction (WGDRR) has included GLIDE in its 2024 Annual Operation Plans (AOPs), many participants showed great interest.

(2) 18th Integrated Workshops (IWS)

ADRC participated in all three events organized by UNESCAP/WMO TC and jointly hosted by the TC Secretariat (TCS) and UNESCAP on 28 November to 1 December 2023 at the United Nations Conference Centre (UNCC), United Nations Building, Bangkok, Thailand.

The first event was the 4th Training and Research Coordination Group (TRCG) Forum, where specialized topics of research interest (e.g., Artificial Intelligence) and potential operational applications related to tropical cyclone monitoring, forecasting, and warning were presented. The second event was the 18th Integrated Workshop (IWS), which is an annual integrated event of the four working groups: Advisory (AWG), Meteorology (WGM), Hydrology (WGH), Disaster Risk Reduction (WGDRR) to assess the work done in the past year and develop work plans for the next year. The third event was the WGDRR parallel meeting, where

Figure 5.14 ADRC participation in the 18th IWS

its 12-member countries and 2 regions assess the year-end progress of implementing the Annual Operation Plans (AOPs). During the WGDRR meeting, ADRC (participating on behalf of the Cabinet Office Japan, which is the focal point for Japan), presented member's report highlighting the disaster risk reduction activities on: information-sharing, capacity-building, and technology transfer highlighting the Quasi Zenith Satellites System's Disaster and Emergency Crisis Report (QZSS-DC Report) service. Moreover, ADRC also presented

an overview the GLIDE number system. After the presentation, WGDRR members agreed to propose the inclusion of GLIDE in the Annual Operations Plans (AOPs) subject for review of the AWG and the TCS.

(3) 18th Meeting of the WGDRR of the Typhoon Committee

As a member of the Typhoon Committee's Working Group on Disaster Risk Reduction (TC/WGDRR), ADRC participated in the 18th Annual Meeting on 13-16 June 2023 at the Lotte Hotel in Ulsan, ROK. The National Disaster Management Research Institute (NDMI), chair of the WGDRR, hosted the meeting on the theme, "Future of the Disaster Risk Reduction: Leveraging Technology to Adapt Climate Change."

Mr SUZUKI Koji (Project Director at ADRC) delivered a technical presentation entitled, "QZSS technology application to early warning message platform" and Mr Gerald Potutan (Senior Researcher at ADRC) presented the "ADRC Activities in line with TC/WGDRR". Both presentations highlighted ADRC's contributions in achieving the TC/WGDRR objectives to reduce the number of deaths and minimize the economic impacts of typhoon disasters in the Asia-Pacific region.

Figure 5.15 Group Photo of participants to the 18th WGDRR Meeting

One of the recommendations from this meeting is to explore the linkage between the Typhoon Committee's Disaster Information System (TC-DIS) with the ADRC's GLobal unique disaster IDEntifier (GLIDE) number system. Under this proposed linkage, ADRC may provide an orientation to the 14-member countries of the TC/WGDRR in inputting disaster information (focusing on tropical cyclone, storm surge, flood, and landslide) to the GLIDE system. The progress of this potential linkage will be reported at the 18th Integrated Workshops (18th IWS) of the Typhoon Committee on 27-30 November 2023 in Bangkok, Thailand.

5.2.5 ASEAN

ADRC participated in the following ASEAN-related events during FY2023.

(1) The 5th ASEAN Committee on Disaster Management (ACDM) + Japan Meeting

On 15-16 June 2023, the 5th ASEAN Committee on Disaster Management (ACDM) + Japan meeting was held in Da Nang, Vietnam. As part of the programme, Mr SASAHARA, Executive Director of the Asian Disaster Reduction Center (ADRC) gave two presentations entitled "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

Figure 5.16 ED Sasahara and Director Murakami of CAO

Management". AHA Centre as well as the representative of Malaysia and some others expressed their interest in these projects. Other activities at the meeting included a report on the progress of each activity under the ASEAN-Japan Work Plan on Disaster Management 2021-2025.

ADRC also participated in the site visit held on the last day of the ACDM meeting. In the morning, the participants observed a disaster management drill carried out by the residents of Binh Hai Commune, Quang Nham Province. Based on the scenario that an early warning for an approaching typhoon was given, the exercise included the provision of pre-response funds and equipment and reinforcement of roofs of vulnerable houses conducted by a youth disaster management team. In the afternoon, the delegation visited a site where mangrove conservation and reforestation project are being implemented by the Green Climate Fund in Bau Ca Cai region, Quang Ngai Province.

(2) ASEAN Interregional Dialogue on Disaster Resilience

ADRC participated in the first ASEAN (The Association of Southeast Asian Nations) Interregional Dialogue on Disaster Resilience (AIDDR) held on 21 August 2023 in Singapore. Adopting the theme, "Regional Perspectives on Building Resilience from Transboundary Risks," AIDDR convened regional organizations in Asia-Pacific region to explore strategies and current approaches to understanding, managing, and reducing transboundary disaster risks and their impacts on other emerging disaster risk issues.

Figure 5.17 Participants of the AIDRR

Speaking on behalf of ADRC, Mr Potutan mentioned that one of the challenges in managing transboundary disasters is that the disaster risk management (DRM) systems of impacted countries usually have different protocols and logistical approaches. In this regard, ADRC facilitated cooperation among its 31-member countries by providing a common platform for: 1) information-sharing on transboundary risks, such as assigning a universal identification of transboundary disasters using the GLIDE number system; and 2) early warning of transboundary risks using satellites, particularly through the QZSS DC Report and Sentinel Asia.

Based on the discussions at the AIDDR, the ASEAN Secretariat indicated to facilitate the following next steps: 1) continue the inter-regional dialogue among regional organizations to strengthen collaboration; 2) conduct capacity mapping of regional organizations to inform initiatives for greater cooperation and synergy; and 3) pursue proposal for collaboration in the areas of data sharing, early warning, and knowledge exchange.

(3) 6th ASEAN Committee on Disaster Management (ACDM) + Japan Meeting

The 6th ASEAN Committee on Disaster Management (ACDM) + Japan Meeting was held on 11 October 2023 in Ha Long, Vietnam. As a part of the program, Mr SASAHARA Akio, Executive Director of the ADRC, gave presentations on the progress of the two ongoing projects: "Promotion of Database Linkage and Capacity Enhancement through Utilization of GLIDE" and "Pilot Project on Utilization of State-of-Art Communication

Technologies for CBDRM and Disaster Emergency Management." With regard to the CBDRM activities, the VietNamese delegates in particular showed interest in the activities, as it is effective for use in rural areas remote from urban centres. Other activities at the meeting included reports on the progress of each activity of the ASEAN-Japan Disaster Risk Reduction Action Plan 2021-2025.

On the last day of the meetings, ADRC participated in the site visit organized for the meeting participants. In the morning, the participants observed a disaster awareness event held at a nearby high school in association with the International Day for Disaster Risk

Figure 5.18 ED Sasahara presenting at the meeting

Reduction. The delegations deepened exchanges with each other on a cruise in the World Heritage-listed Ha Long Bay.

5.2.6   Other International Engagements

International organizations and partners invited ADRC to participate and share information in many other international events.

(1)   Workshop for the Technical Expert Service on Increasing Efficiency of Provincial Disaster Management

Two earthquakes with a magnitude of 7.7 and 7.6 respectively occurred in Türkiye on 6 February 2023, causing great destruction in 10 provinces. Considering this experience, the Turkish Ministry of Internal Affairs and the Denizli Governorship decided to conduct a five-day workshop in Denizli titled "Technical Expert Service on Increasing Efficiency of Provincial Disaster Management," with the support of the Asian Productivity Organization (APO). Officials from AFAD Denizli also joined the workshop as key experts. One of the most important objectives of this activity is to identify the problems experienced before and after the earthquake disaster, to discuss concrete interventions for solving those problems, and to develop a coordination system in order to establish a policy for addressing potential future disasters.

Dr IKEDA Makoto from ADRC attended the workshop as a speaker and made several presentations. Professor MURATA Masahiko from Kansai University of International Studies also participated and shared his experiences of the Great Hanshin-Awaji Earthquake. The participants also engaged actively in discussion with Professor Murata and Dr Ikeda, and the workshop proved to be useful occasion for considering how to achieve better DRR in Türkiye going forward.

Figure 5.19 Workshop on Technical Expert Service

(2)   Third Expert Forum for Producers and Users of Disaster-related Statistics

UNESCAP hosted the Third Expert Forum for Producers and Users of Disaster-related Statistics in Bangkok, Thailand in a hybrid forum on 5-7 June and associated events on 8-9 June 2023, co-organized by the Forum was co-organized by the United Nations Economic Commission for Africa (ECA), the United Nations Economic Commission for Europe (ECE), the United Nations Economic Commission for Latin America and the Caribbean (ECLAC), UNESCAP, the United Nations Economic and Social Commission for Western Asia (ESCWA), UNDRR, and the United Nations Department for Economic and Social Affairs (UNSD). The objectives of the Forum were to advance the production and use of disaster-related statistics for risk-informed development in support of the aim of IAEG-DRS of the United Nations Statistical Commission by facilitating the exchange of country experiences in using disaster related statistics to monitor disaster risk reduction commitments and inform development, as well as in producing such statistics to identify best practices and replication possibilities. The participation included 274 persons including experts from the National Statistical Offices, National Disaster Management Agencies and UN Agencies, participants form academic sector, non-governmental organizations groups and the representatives of intergovernmental organizations, international organizations, and national planning and budgeting offices.

Figure 5.20 Flyer of the 3rd Expert Forum

(3)   Workshop on validation of the prototype for the new losses and damages tracking system

On 3-4 May 2023, ADRC attended the "Technical workshop: validation of the prototype for the new losses and damages tracking system" held in Bonn, Germany. The workshop which was organized by UNDRR, UNDP and WMO aimed to gather feedback from practitioners, experts and other losses and damages data stakeholders on the draft prototype of a new tracking system of the losses and damages data that is now in the process of development. During the two-day workshop, over 80 participants actively exchanged opinions in person and virtually about several issues of the new system such as functionalities, data analysis, visualization and administration. It is expected that the new system will ensure the use of data to generate insights for comprehensive disaster

Figure 5.21 UNDRR presentation at the workshop

and climate risk management and for risk-informed sustainable development policy making and investment decisions.

(4)　Study Visit to Affected Areas of Türkiye Earthquake (Hyogo Prefecture Türkiye Earthquake Recovery and Reconstruction Support Project)

ADRC visited Türkiye from 24 September to 2 October 2023, staying six days in Türkiye, to study the state of their recovery in field of education in areas affected by the Türkiye-Syria Earthquake that occurred in February 2023. This study was supported by the "Hyogo Prefecture Türkiye Earthquake Recovery and Reconstruction Support Project" and conducted in collaboration with Mr SUWA Seiji, Visiting Professor, University of Hyogo. In addition, Dr Emin Özdamar of the Turkish Japanese Foundation greatly cooperated in this project.

The delegation visited schools that were damaged by the earthquake in the Province of Gaziantep, Kahramanmaraş, and Hatay, and had interviews regarding school education and the situations of teachers and children after the earthquake. Workshops were also conducted with education communities to share the experiences of the Great Hanshin-Awaji Earthquake and the Great East Japan Earthquake, including the response of the actual education sites and the recovery efforts they have made.

Figure 5.22 Discussions during the visits to the Hatay Mustafa Kemal University

The teachers were still in deep grief from the earthquake but they were working hard to reopen schools, continue education, and care for children. The Ministry of National Education (MoNE) has been providing mental health and psychosocial support for teachers and children by dispatching specialists and holding seminars for teachers, however, for a long-term recovery, continuous supports for teachers and children in schools are necessary. Moreover, reconsideration of future disaster education based on the experience of this earthquake is also essential. ADRC will create opportunities to share experiences of disasters between Türkiye and Japan through communication exchanges with teachers and children.

6. International Recovery Platform

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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 United Nations Office for Disaster Risk Reduction (UNDRR) and the Hyogo Prefectural Government (Annex 2: Overview of IRP).

6.1 International Recovery Forum 2024

The International Recovery Forum 2024 concluded successfully in Kobe, Japan, on 25 January 2024, marking a big step forward in global efforts towards resilient recovery from disasters. Hosted by the International Recovery Platform (IRP), this Forum, themed "Accelerating Progress with Building Back Better: Resilient Recovery in the Face of Rising Climate Risks," brought together nearly 350 participants on-site and online from 70 countries, including national and local government officials, disaster risk reduction practitioners, and experts to foster dialogue on practical, scalable solutions to the challenges countries have faced with post-disaster recovery and building back better. The Forum featured pre-events on the 24 January, including a side-event, "Empowering Community-Based Disaster Management", and a workshop for all participants and speakers on "Pre-Disaster Recovery Planning".

Figure 6.1 Chair IRP Steering Committee Mr Ronald Jackson, UNDP (left) with the panellists

During the Forum, delegates addressed numerous recovery challenges. They highlighted the critical role of capacity building and the exchange of recovery knowledge and good practices. The discussions also focused on supporting nations in preparing for and improving recovery processes, highlighting the need to empower countries and communities with the necessary knowledge, capacities, and strategies to rebuild stronger, faster, and more inclusively before disasters strike. Furthermore, the commitment to inclusive recovery planning was a prominent theme, stressing that recovery programs must be tailored to the specific needs and goals of impacted communities and involve them directly in the planning process. This ensures that resilience strategies are co-created with those most affected, promoting sustainable development and resilience against future events while ensuring that no one is left behind.

The International Recovery Forum 2024 featured 33 speakers representing 17 countries. Speakers in the pre-event day included Mr. Sanjaya BHATIA, Head, UNDRR Global Education and Training Institute (GETI), Ms. KANBARA Sakiko, Professor of Kobe City College of Nursing, Mr. Gerald Potutan, Senior Researcher,

Asian Disaster Reduction Center, and Mr. Ryoma KAYANO, Technical Officer, World Health Organization Center for Health Development (WKC).

The opening session included Mr. HATTORI Yohei, Vice Governor on behalf of Mr. SAITO Motohiko, Governor of Hyogo Prefecture, Ms. OHASHI Makiko, Director on behalf of Mr. UEMURA Noboru, Deputy Director General for Disaster Management, Cabinet Office of Japan, Mr. Ronald JACKSON, Chair of the IRP Steering Committee (UNDP), and Mr. Sujit MOHANTY, Chief of Branch, Intergovernmental Processes, Interagency Coordination and Partnerships (UNDRR). Mr. Paul ROSENBERG, UNDRR Kobe Office, gave a presentation on the Challenges and Ways Forward Addressing Priority 4 to set the context for the discussions in the subsequent sessions.

The first panel session, "Understanding the Barriers in Resilient Recovery" delved into the experiences of diverse countries, to understand the key challenges they have experienced with recovery since the adoption of the Sendai Framework. The discussions sought to identify high-impact, modifiable challenges that should be prioritized and addressed in order to improve recovery outcomes for impacted communities. The session was moderated by Ms. Simonetta SILIGATO, Senior Advisor, Office of the Regional Director, Bangkok (UNOPS). Speakers included Mr. Osama Ibrahim MUHAMMED, Chief Engineer, Ministry of Environment, Iraq; Mr. Charles KALEMBA, Commissioner, Department of Disaster Management Affairs (DoDMA), Malawi;

Mr. Dave GAWN, Chief Executive, National Emergency Management Agency, New Zealand; Mr. Robert ERNESTA, Director General, Disaster Management Division, the Seychelles; and Ms. Zorana ZEC, International Relations Officer, Sector for Emergency Management of the Ministry of the Interior, Serbia.

Figure 6.2 Panellists of the first session

The second panel session, "Opportunities to Build Back Better through Recovery Preparedness" discussed good practices and evidence of what works with recovery preparedness. The session sought to learn from countries' experience, and how it informed preparedness for recovery from future events. The session was moderated by Mr. Sujit MOHANTY. Panel 2 speakers included, Ms. Michelle FORBES, Director, National Emergency Management Organization, Saint Vincent and the Grenadines; Ms. Melissa PEXTON, Deputy Commissioner, Strategy and Emergency Management Command at Department of Fire and Emergency Services, Western Australia; Mr. Mafua-'i-Vai'utukakau MAKA, Director, Naitonal Disaster Risk Management Office, Tonga, Ms. Vasiti SOKO, Director, National Emergency Management Office, Fiji; and Mr. Daniel OBOT, Director, Disaster Risk Reduction, National Emergency Management Agency, Nigeria.

The 2024 IRP Forum featured three parallel sessions on key topics. The first parallel session, "Japan's Experience and Contributions to Building Back Better from the Past and the Future" was moderated by Mr.

Section 6

Kazushige ENDO. Speakers included Mr. ONO Yuichi, Professor, Tohoku University; Mr. NISHIKAWA Satoru, JICA Senior Coordinator; Ms. Momoko NISHIKAWA, Programme Management Officer, Intergovernmental Processes, Interagency Coordination and Partnerships, UNDRR; Mr. MURATA Masahiko, Professor, Kansai International University; and Mr. SHAW Rajib, Professor, Keio University. The second parallel session, "Capacity and Bespoke Needs of Countries for Uptake of

Figure 6.3 Panellists of the second session

Recovery Preparedness Measures", was moderated by Ms. Keiko SAITO, World Bank. Speakers included Mr. Charles KALEMBA, Mr. Osama Ibrahim MUHAMMED, Mr. Dave GAWN, and Mr. Mustapha Habib AHMED, Director General, National Emergency Management Agency, Nigeria. The third parallel session, "Innovative Options to Finance Resilient Recovery" was moderated by Mr. Steven GOLDFINCH, Asian Development Bank. It included speakers Mr. Andrew MINACK, First Assistant Coordinator-General, Programs and Policy Division National Emergency Management Agency, Australia, Mr. Mafua-'i-Vai'utukakau MAKA, Ms. Zorana ZEC, and Ms. Motlalepula PITSO, Director, Disaster Preparedness and Response Coordination, South Africa.

The third panel session, "Accelerating Progress with Recovery Practice in Small Island Developing States" sought to understand the unique challenges for SIDS with resilient recovery and building back better, as well as good practices and "what works" with building back better in the SIDS context. The session was chaired by Mr. Ronald JACKSON. The panel included Mr. Robert ERNESTA, Mr. Mafua-'i-Vai'utukakau MAKA, Ms. Michelle FORBES, and Ms. Vasiti SOKO.

The fourth panel session, "Practical Strategies for Scaling up Global Progress with Priority 4", brought together the day's proceedings for a deeper discussion on how to scale up identified opportunities, and how to address common challenges. The session was chaired by Mr. Abhilash PANDA, Deputy Chief, Intergovernmental Processes, Interagency Coordination, and Partnerships, UNDRR. Speakers included Ms. Vasiti SOKO, Ms. OHASHI Makiko, Mr. Mustapha Habib AHMED, and Mr. Andrew MINACK. The session also brought the chairs of the parallel sessions into the discussions as well as the IRP Steering Committee members for their views.

Finally, the speakers at the closing session were Mr. Abhilash PANDA, and Ms. OHASHI Makiko, who spoke on behalf of Mr. MURAKAMI Takeo, IRP Co-chair and Director, Cabinet Office of Japan.

6.2   Contributions to the G20 Working Group on Disaster Risk Reduction

The Secretariat of the G20 Working Group on Disaster Risk Reduction requested the International Recovery Platform to develop two knowledge products as inputs to the three G20 DRR working group meetings held in 2023.

The IRP Secretariat, in collaboration with IRP Steering Committee members, produced "Good Practices in Financing Recovery and Building Back Better". This recovery brief provides recovery practitioners with lessons and good practices on financing post-disaster recovery, recovery preparedness and building back better. Detailed through 31 case studies from 18 countries, the brief addresses key elements that are critical for recovery financing. It aims to inspire countries to address recovery finance challenges through examples of good practice and the application of lessons learned throughout the financing process.

Additionally, for the third meeting of the G20 WG on DRR, IRP Secretariat supported the development of "Building Back Better - Practice review and knowledge-building for frontier Issues", a knowledge product led by IRP Steering Committee members Asian Development Bank, United Nations Development Programme, and UNDRR. This document provides a detailed review of the current state of knowledge and frontier issues related to building back better in recovery. The key objectives of this paper are to reflect the breadth and depth of how BBB has come to be understood and made actionable during disaster recovery, and to crystalize and illustrate, drawing on specific case studies, both learnings and outstanding quandaries that warrant concerted attention going forward.

6.3   Knowledge Management

IRP continues its efforts to maintain the largest online database of recovery resources on the internet.

In 2023, the IRP Secretariat expanded the online library to more than 1,841 recovery-related publications, tools, and guidelines, curated to support research and learning. The resources are shared with Prevention Web to facilitate wider access and use. The IRP Secretariat added to the library 29 post-disaster needs assessments, 33 PDNA guidance documents, and 41 disaster recovery frameworks, along with 9 specific DRF guidance materials. The IRP Secretariat expanded its library of specialized recovery collections, which aggregate all available resources on notable recovery experiences. Within this library, the Secretariat developed a dedicated collection focused on the Great East Japan Earthquake and Tsunami.

6.4   8th National Convention for the Promotion of Disaster Reduction

IRP participated in the 8th National Convention for the Promotion of Disaster Reduction (Bosai Kokutai 2023). The Bosai Kokutai 2023 was held in Yokohama, Kanagawa Prefecture, and was organized by the Executive Committee for the National Conference on Disaster Prevention 2023, and led by the Cabinet Office of Japan in cooperation with Kanagawa Prefecture, Yokohama City, Yokohama National University. This event has been held since FY2016 and is now in its eighth year. The purpose of this event is to raise awareness of disaster prevention and to share knowledge and experiences about disasters in order to enhance disaster preparedness. It serves as an opportunity to raise awareness of disaster prevention at the individual and community levels. At the conference, IRP showcased its activities to promote building back better through an exhibition booth, engaging the international community. The booth featured a display of IRP's recovery

guidance notes and leaflets that outline its initiatives. Additionally, IRP distributed the IRP Herald, various knowledge products, and emergency whistles promoting the IRP website.

6.5   2024 Sendai Symposium for Disaster Risk Reduction and the Future

IRP participated in 2024 Sendai Symposium for Disaster Risk Reduction and the Future (Sendai Bosai Mirai Forum 2024). The Sendai Bosai Mirai Forum 2024 was held in Sendai, Miyagi Prefecture, organized by the City of Sendai. This event provides a platform for citizens to engage in learning about disaster prevention and to share their initiatives. It aims to ensure that the lessons learned and experiences from the Great East Japan Earthquake are preserved and passed on to future generations.

The IRP Secretariat hosted an exhibition booth to showcase its initiatives and advance the

Figure 6.4 IRP Booth at the Bosai Mirai Forum 2024

concept of building back better. The booth featured an array of materials including recovery guidance notes, informational leaflets detailing IRP's activities, copies of the IRP Herald, and various knowledge products. Additionally, emergency whistles with an IRP QR code were distributed to promote engagement and awareness.

Section 6

7. Natural Disaster Databook 2023
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7. 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 (Annex 3: Notes on the Sources of Data).

In general, the statistical overview is focused on comparing the trend in 2023 with the trend in the past 30 years, and presented in three parts:

- Section 7.1 compares the natural disaster data of 2023 with the annual average of the last 30-year (1993-2022)

- Section 7.2 compares the climate-related disaster data of 2023 with the annual average of the last 30-year (1993-2022)

- Section 7.3 analyzes COVID-19 data up to 2023 since the World Health Organization 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 of 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. In other words, this Databook will not show how many of the deaths are male or female, how many of the houses destroyed are in rural or urban areas, or which sector accounts for the greatest economic losses. Instead, this Databook simply shows an overview of trends (whether increasing or decreasing) of disaster occurrences and its impacts. By providing an overview of the trends, readers may gain curiosity to investigate the reasons behind them.

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. As the most prone region in the world, many of these disasters were in Asia where the number of disaster occurrences in 2023 was 152 events compared to the annual average for the past 30 years (1993-2022), which is 132 events/year. In terms of the number of deaths, we observed that 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 disaster risk reduction (DRR) measures. In terms of economic losses, the data shows an increasing trend

both globally and in Asia. However, one significant observation in 2023 is that while economic losses generally show an increasing trend for almost all disaster types, it is not case for flood. Globally, economic losses from floods in 2023 is lower (USD 20.37 billion) compared to the annual average of the past 30 years (USD 30.06 billion/year). Similar trend is observed in Asia, where economic losses from flood in 2023 (USD 0.17 billion) is lower compared to the 30-year average (USD 18.21 billion/year). This is a unique trend in 2023, where economic losses from flood disaster decreased, igniting further investigation.

Since climate change is attributed as one of the reasons for the increasing disaster trend (i.e., the rising temperature increases the moisture that the atmosphere can hold, resulting in more storms and heavy rains), this Databook looks at the trend of climate-related disasters, particularly drought, storm, flood, and extreme temperature. In 2023, global temperature reached exceptionally high, close to 1.50C limit. In particular, temperatures from June onwards made 2023 the warmest year on record, overtaking by a large margin 2016, the previous warmest year. Globally, climate-related disasters in 2023 recorded 322 events, which is higher than the annual average of the last 30 years (1993-2022) of 286/year. If we break it down by disaster type, it shows flood with 151 events, storm with 101 events, extreme temperatures with 18 events, and drought with 16 events. As recorded, the frequency of flood and storm occurrences consistently increase since 1993. Like the global trend, climate-related disasters in Asia are higher in 2023 with 121 events compared to the annual average of the last 30 years (1993 to 2022) with 111 events/year. If we breakdown the climate-related disasters of 2023, it shows flood with 61 events, storm 41 events, extreme temperatures with 5 events, and droughts with 4 events.

COVID-19 data (i.e., confirmed cases and deaths) provides useful information for governments and stakeholders to decide whether to sustain early warning, surveillance, and travel advisories. Since cases and deaths remarkably declined in May 2023, many countries around the world had lifted all COVID-19 travel restrictions (e.g., proof of vaccination to enter the country). Consequently, a number of countries had discontinued reporting the COVID-19 situations to the World Health Organization (WHO). Using such limited information, we noted that in 2023, a cumulative total of 773,940,523 confirmed cases and 7,015,982 deaths were reported. The data showed that the highest number of confirmed cases on a single day was reported on 19 December 2022 with 44.20 million cases, and this drastically declined in the beginning of 2023 until the end of that 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.

7.1   Natural Disaster Data

In this section, we look at 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 2023 with the annual average of the last 30-year (1993-2022) to examine the trends at the global level and in Asia.

7.1.1   Global Disaster Data

Based on the EM-DAT's records from 1900 to 2023, we can observe an increasing trend of disaster occurrences in the world with a noticeable leap that began in the 1960s (Figure 7.1). Between this period (1900–2023), the average number of disaster occurrence per year is 117. However, if we compare it with the last decade (2013-2022), the average number of disaster occurrence per year increases to 349.
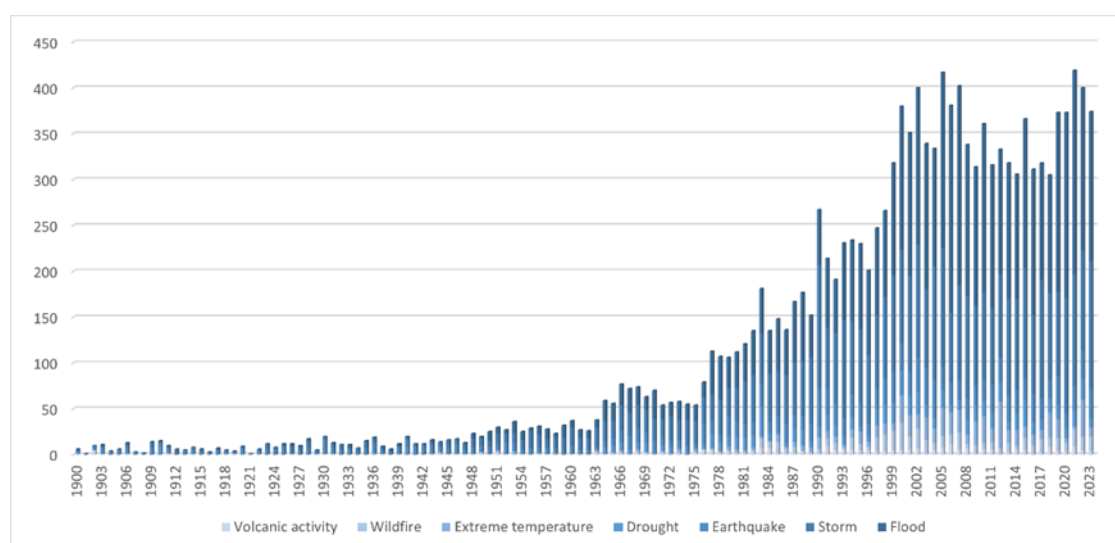
Figure 7.1 Global trend of natural disaster occurrence 1900-2023 (EM-DAT/CRED, 2024)

Since 1900, the top three disaster occurrences are floods (41% or 5,926 events), storms (33% or 4,731 events), and earthquakes (11% or 1,612 events).

(1)   Occurrence (Global)

HIGHER in 2023. If we look at year 2023 alone, the total number of disaster occurrence is 374 (i.e., considering only six disaster types: drought, earthquake, extreme temperature, flood, storm, wildfire, and volcanic activity). This number is higher by 13% compared to the annual average for the past 30 years (1993-2022), which is 330 (Figure 7.2). In 2023, the most frequent occurrences were floods (44% or 163 events), storms (37% or 139 events), and earthquakes (9% or 32 events).
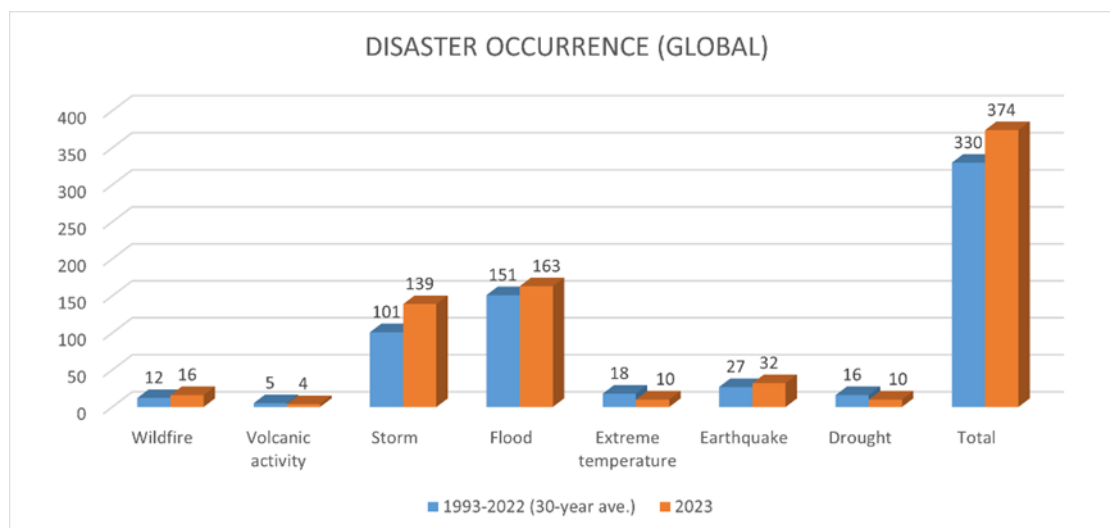
Figure 7.2 Global disaster occurrence by disaster type 2023 vs 1993-2023 (EM-DAT/CRED, 2024)

(2)   Deaths (Global)

<u>HIGHER in 2023</u>. The total number of deaths from disasters in 2023 is 85,641. This is approximately 1.7 times higher than the 30-year average of 50,691 deaths/year from 1993-2022 (Figure 7.3). In 2023, earthquakes caused the highest number of deaths with a total of 62,451 (73%). This increase is primarily attributed to the Türkiye-Syria earthquakes of 6th February 2023.
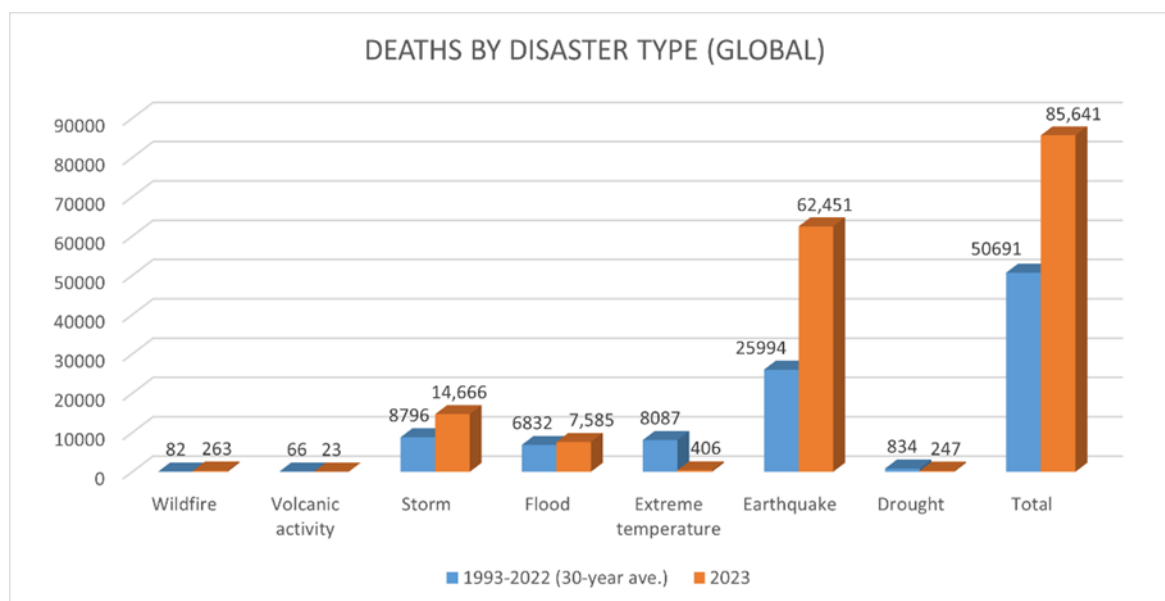

Figure 7.3 Number of people killed by disaster type 2023 vs 1993-2022 vs 2023 (EM-DAT/CRED, 2024)

Deaths from storms in 2023 is 14,666. This is higher than the 30-year average of 8,796 deaths/year. One of the reasons for this notable increase in 2023 is due to the impact of storm Daniel in Libya, which resulted in 12,352 deaths. Regarding deaths from floods, the total number in 2023 is 7,585 higher than the 30-year average of 6,832 deaths/year. This increase can be attributed to the flooding incidents in the Democratic Republic of Congo (3,014 deaths) and India (1,529 deaths).

(3)   People Affected (Global)

<u>LOWER in 2023</u>. In 2023, the estimated number of people affected by disasters is 92.81 million. This is lower than the annual average over the past three decades (1993-2022), which stands at 200.55 million people/ year (Figure 7.4). However, considering the impacts of Türkiye-Syria earthquakes, 2023 shows more people affected by earthquakes compared to the annual average of the last 30 years, which was 4.85 million people per year affected by earthquake. The top three regions with the greatest number of people affected by disaster in 2023 are Asia (71% or 66.33 million people), Africa (14% or 12.54 million people), and the Americas (12% or 10.73 million people). This signifies that Asia remains the most disaster-prone region in the world.
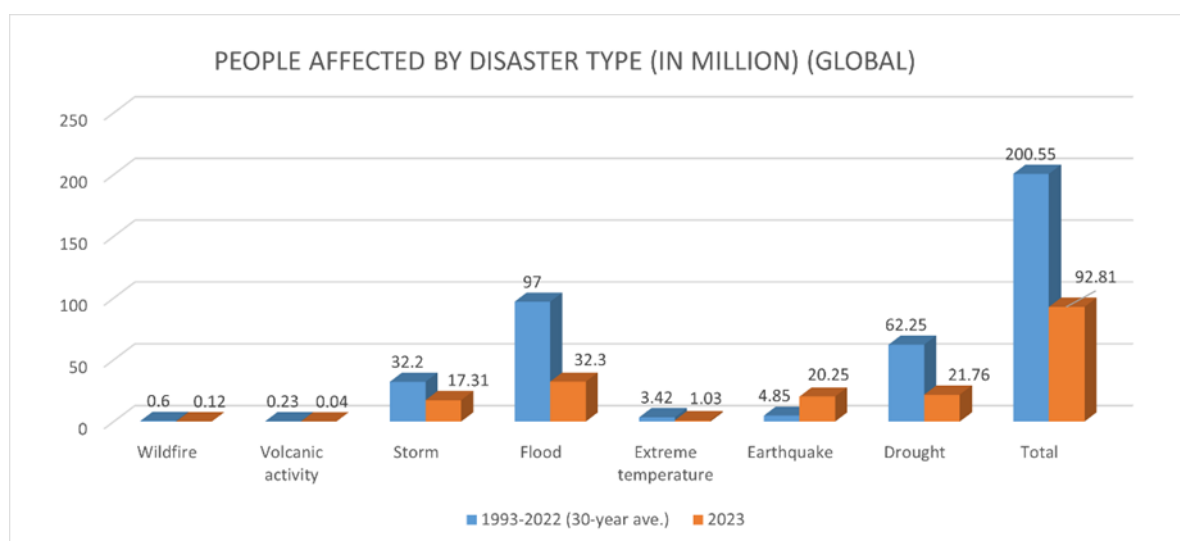
Figure 7.4 Number of people affected by disaster type 2023 vs 1993-2022 (EM-DAT/CRED, 2024)

In 2023, floods affected 32.3 million people (35%), droughts affected 21.76 million people (23%), earthquakes affected 20.25 million people (22%), and storms affected 17.31 million people (19%).

(4)   Economic Losses (Global)

<u>HIGHER in 2023</u>. Economic losses from disasters in 2023 amounted to USD 202.11 billion, which is higher than the annual average for the past 30 years of USD 124.33 billion/year (Figure 7.5). About half (USD 100.85 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 account for the most economic losses with an average of USD 56.86 billion/year.

Although we can observe an increasing trend of economic losses in wildfire, storm, earthquake, and drought, economic losses from flood (USD 20.37 billion) shows a decreasing trend in 2023 compared with the annual average of the past 30 years (USD 30.06 billion/year).
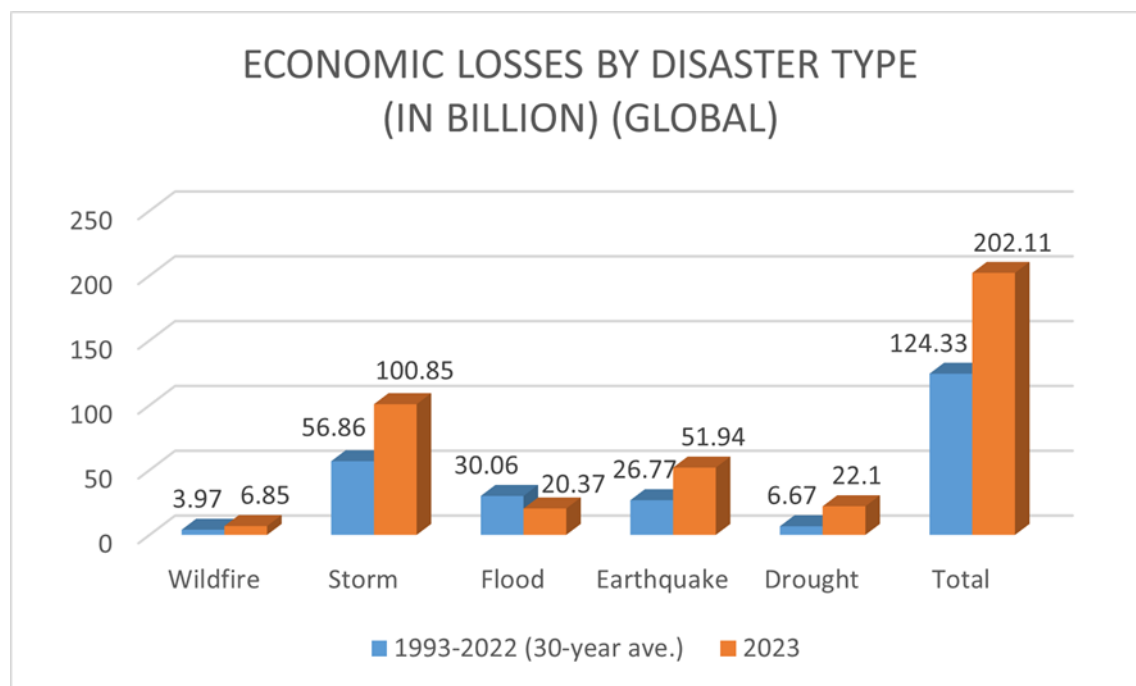
ECONOMIC LOSSES BY DISASTER TYPE (IN BILLION) (GLOBAL)

Figure 7.5 Economic losses by disaster type 2023 vs 1993-2022 (EM-DAT/CRED, 2024)

7.1.2 Asian Disaster Data

Similar to the global trend, disaster occurrence in Asia has been increasing during the period 1900-2023 (Figure 7.6). EM-DAT recorded a total of 5,946 disaster events in Asia with flood (2,455 events or 41%) as the most frequent occurrence followed by storms (1,968 events or 33%), and earthquakes (949 events or 16%). In this period (1900-2023), the average number of disaster occurrence is 48 events/year. However, if we look at the most recent decade (2013-2022), the average number of disaster occurrence has increased to an average of 146 events/year.
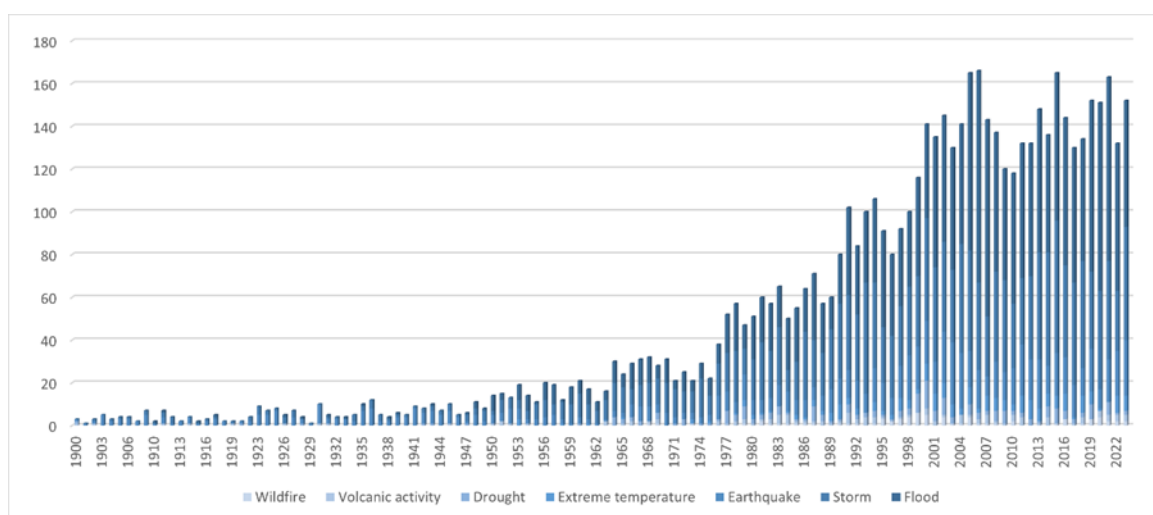
Figure 7.6 Trend of natural disaster occurrences in Asia 1900-2023 (EM-DAT/CRED, 2024)

Historically, the top 10 countries in Asia with the highest number of disaster occurrences in the last 123 years are China (915), India (642), Philippines (638), Indonesia (518), Japan (361), Bangladesh (325), Islamic Republic of Iran (255), Vietnam (247), Pakistan (212), and Türkiye (195) (Figure 7.7).

TOP 10 COUNTRIES IN ASIA
DISASTER OCCURRENCE 1900-2023

Türkiye
195

Iran
255

Pakistan
212

India
642

Bangladesh
325

China
915

Japan
361

Vietnam
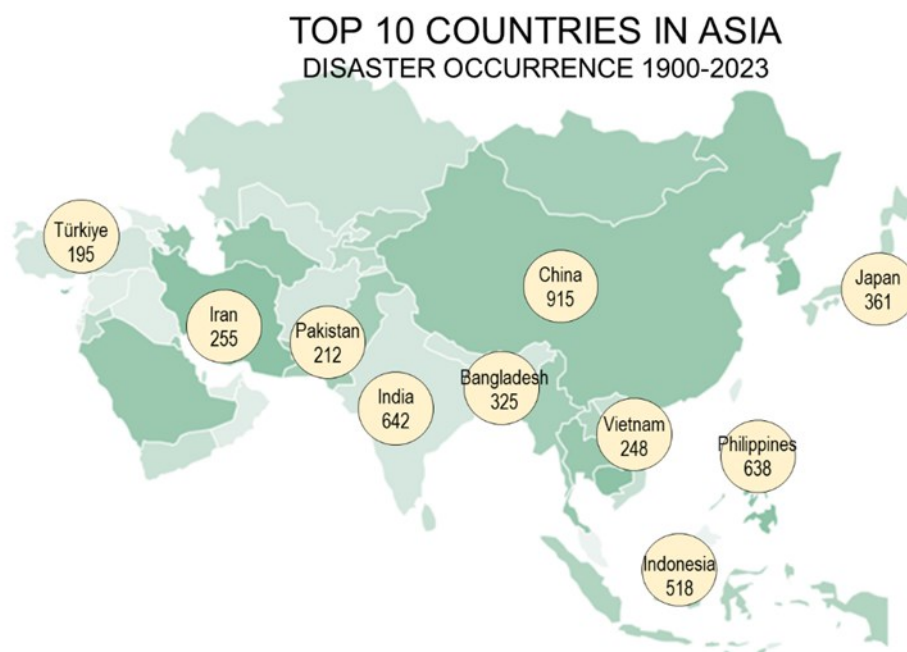248

Philippines
638

Indonesia
518

Figure 7.7 Top 10 disaster occurrences in Asia 1900-2023 (EM-DAT/CRED, 2024)

Many of the disaster events in 2023 occurred in Asia, including the floods in India, Yemen, and Philippines; storms in India (Michaung) and China (Doksuri); earthquakes in Türkiye, Syria, and Afghanistan; and droughts in Indonesia.

(1) Occurrence (Asia)

<u>HIGHER in 2023</u>. In 2023, a total of 152 disasters occurred in Asia. This is 15% higher than the annual average for the past 30 years (1993-2022), which is 132 events/year. Flood (59 events or 39%) is the most frequent disaster followed by storm (53 events or 35%), and earthquakes (26 events or 17%) as shown in Figure 7.8. Occurrence of drought, wildfire, extreme temperature, and volcanic activity were also recorded, but their frequency is lesser compared with flood or storm.
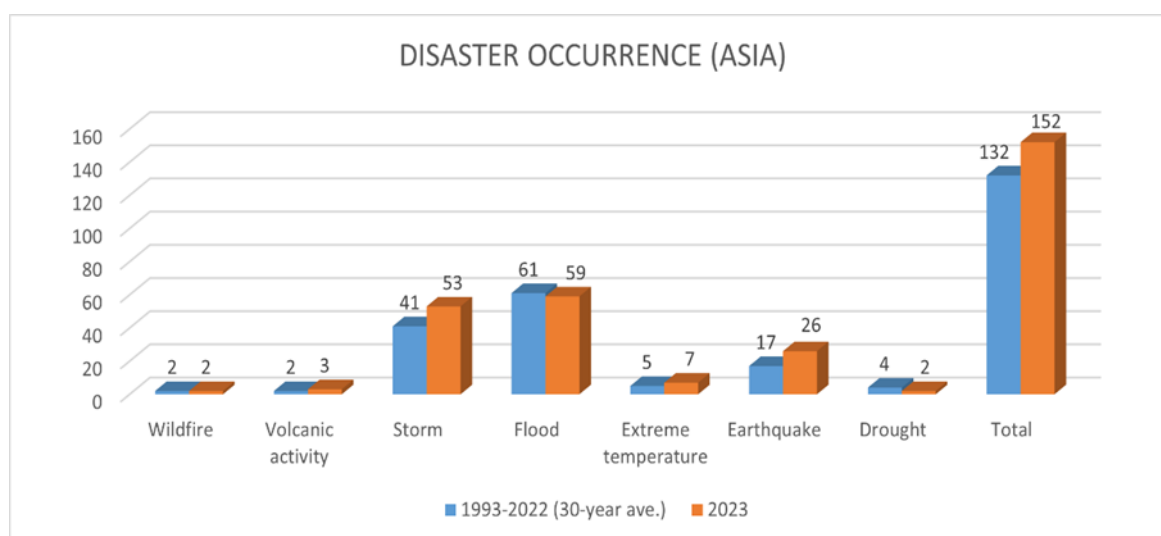
DISASTER OCCURRENCE (ASIA)

	Wildfire	Volcanic activity	Storm	Flood	Extreme temperature	Earthquake	Drought	Total
1993-2022 (30-year ave.)	2	2	41	61	5	17	4	132
2023	2	3	53	59	7	26	2	152

■ 1993-2022 (30-year ave.)   ■ 2023

Figure 7.8 Disaster occurrence in Asia by disaster type 2023 vs 1993-2022 (EM-DAT/CRED, 2024)

Section 7

Notably, there is significant increase in the occurrence of earthquake (26 events) in 2023 compared with the occurrence of earthquake in the last 30-year that has an average of 17 events/year.

(2)   Deaths (Asia)

<u>HIGHER in 2023</u>. Asia recorded a total of 63,017 deaths in 2023, which is higher than the 30-year annual average of 30,167 deaths/year (Figure 7.9). While floods and storms were the most frequently occurring disasters in 2023, earthquakes caused the most deaths. In particular, the Türkiye-Syria earthquake was the most catastrophic event of 2023 causing 56,683 deaths. This single event caused 90% of all disaster-related deaths in 2023 and was more than three times higher than the average annual earthquake deaths over the past 30 years, which is 17,978. The second major disaster was a flood in India, which caused 1,529 deaths.
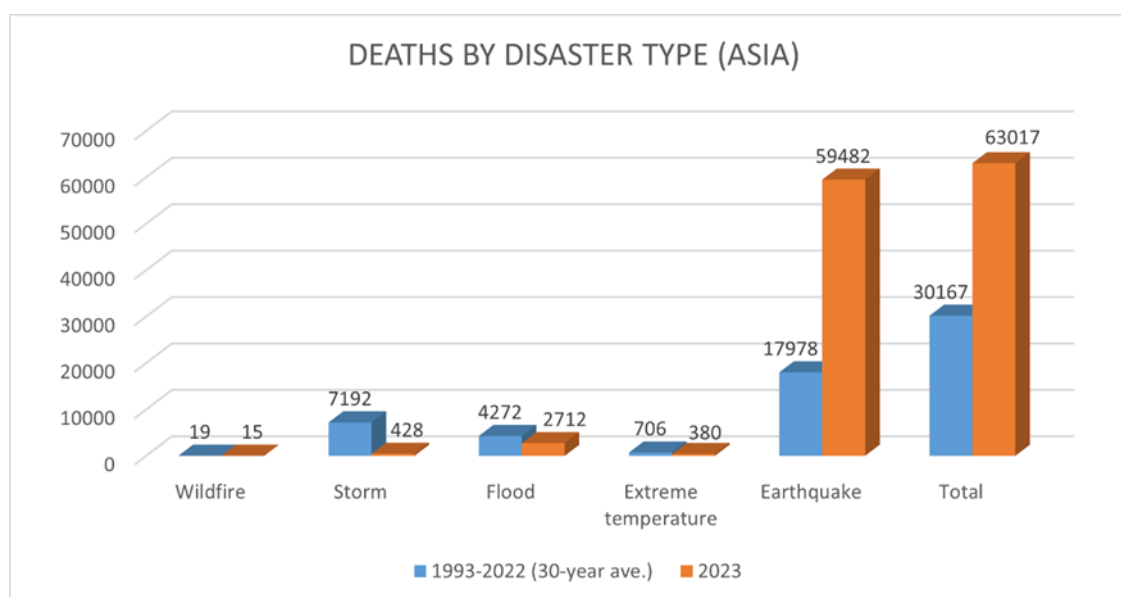
Figure 7.9 Number of people killed by disaster type in Asia 2023 vs 1993-2022 (EM-DAT/CRED, 2024)

(3)   People Affected (Asia)

<u>LOWER in 2023</u>. An estimated number of 66.28 million people in Asia were affected by disasters in 2023, which is lower than the average of the past 30 years (1993-2022) of 168.88 million people/year (Figure 7.10). If we breakdown the number of people affected by disaster type, it shows the following: earthquake (19.25 million people or 29%), droughts (18.75 million people or 28%), floods (17.49 million people or 26%), and storms (9.76 million people or 15%). If we breakdown by region, it shows the following: Southeast Asia (22.97 million people), South Asia (20.04 million), and West Asia (19.81 million people).
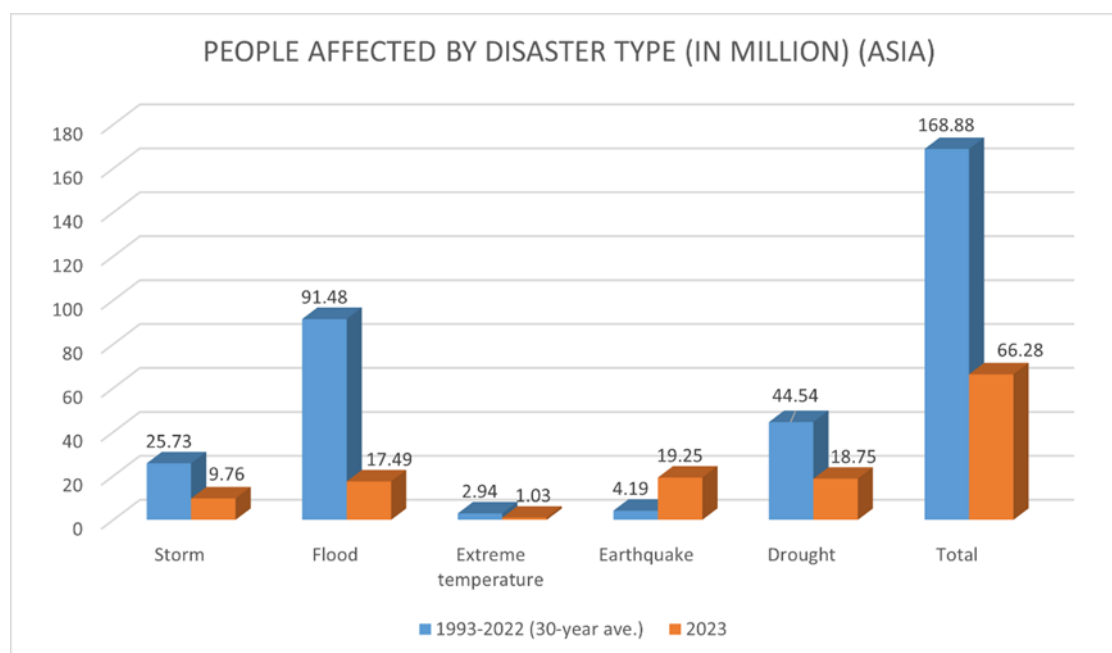
Figure 7.10 Number of people affected by disaster type in Asia 2023 vs 1993-2022 (EM-DAT/CRED, 2024)

If we specifically look at earthquake, the number of people affected by this disaster type in 2023 (i.e., 19.25 million people) is four times higher than the past 30 years with an average number of 4.19 million people affected/year.

(4)   Economic Losses (Asia)

HIGHER in 2023. Economic losses from disasters in Asia in 2023 is approximately USD 75.92 billion, which is higher than the average annual economic losses for the past 30 years of approximately USD 52.25 billion/ year (Figure 7.11). If we breakdown the economic losses of 2023 by disaster type, it shows: earthquake (USD 44.42 billion), storm (USD 28.63 billion), drought (USD 2.7 billion), and flood (USD 0.17 billion). If we lump all disaster types (i.e., drought, earthquake, extreme temperature, flood, storm, wildfire, and volcanic activity), the trend shows higher economic losses in 2023 compared with the annual average of the past 30 years. However, if we look only at flood alone, we will notice a lower amount of economic losses in 2023 (USD 0.17 billion) compared with the annual average of the past 30 years (1993 to 2022) which is USD 18.21 billion/ year.

If we breakdown the economic losses by countries in 2023, it shows the following: Türkiye (USD 34.03 billion or 45%), China (USD 29.55 billion or 39%), and Syria (USD 8.9 billion or 12%).
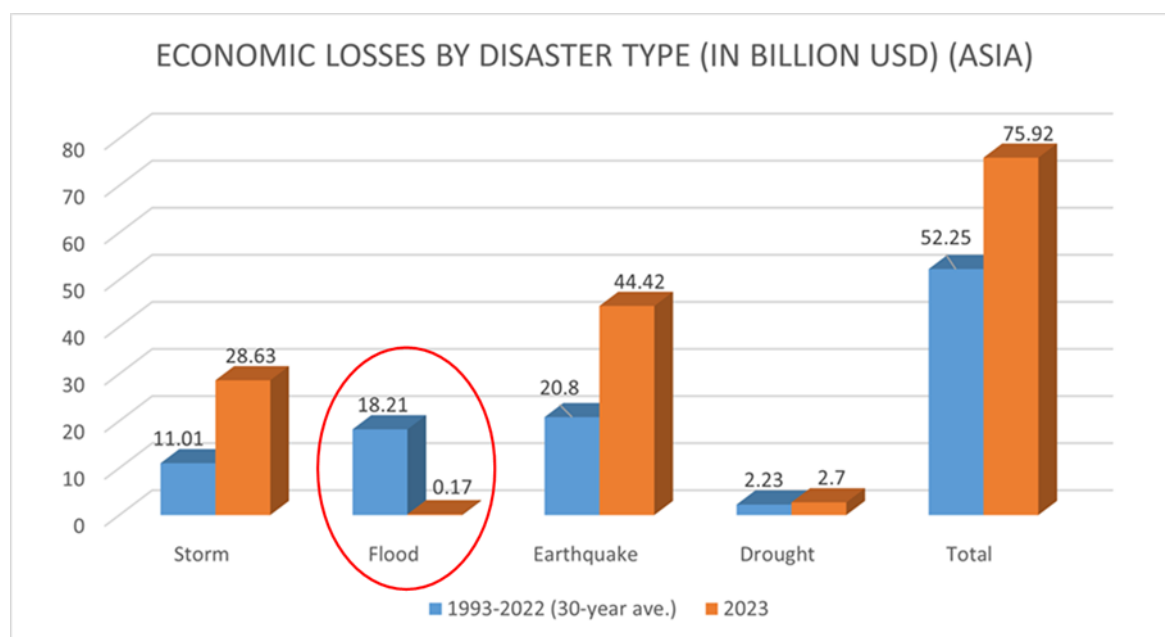
Section 7

Figure 7.11 Economic losses by disaster type in Asia 2023 vs 1993-2022 (EM-DAT/CRED, 2024)

7.2 Climate-Related Disasters

Climate change is attributed as one of the reasons for the increasing disaster trend, such as the increasing frequencies and intensities of water hazards like flood and storm. In fact, it is mentioned the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6) that the frequency and intensity of extreme weather events are already increasing, and are expected to rise further with every additional increment of global warming. Rising global temperatures increase the moisture the atmosphere can hold, and this results in more storms and heavy rains.

According to Copernicus Climate Change Service, global temperatures reached exceptionally high levels in 2023 that was close to 1.5^0C limit. Unprecedented global temperatures from June onwards led 2023 to become the warmest year on record, overtaking by a large margin 2016, the previous warmest year. With every degree of global warning, flood risks and drought (as well as its impacts) are expected to increase. In this section, we look at the data on drought, storm, flood, and extreme temperature for an overview of climate -related disasters.

7.2.1 Global trend in climate-related disasters

HIGHER in 2023. Climate-related disasters (i.e., drought, storm, flood, and extreme temperature) in 2023 recorded 322 events, which is higher than the annual average of the last 30 years (1993-2022) of 286/year (Figure 7.12). If we break it down by disaster type, it shows flood with 151 events, storm with 101 events, extreme temperatures with 18 events, and drought with 16 events. As recorded, the frequency flood and storm occurrences consistently increase since 1993.
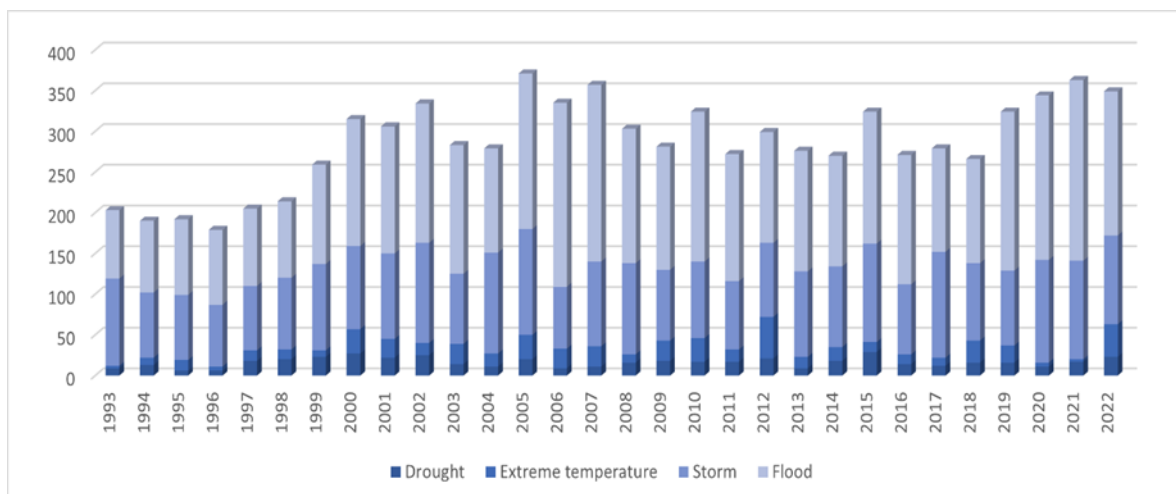
Figure 7.12 Global trend of climate-related disasters 1993-2022 (EM-DAT/CRED, 2024)

7.2.2　Asian trend in climate-related disasters

<u>HIGHER in 2023</u>. Like the global trend, climate-related disasters in Asia is higher in 2023 with 121 events compared to the annual average of the last 30 years (1993 to 2022) with 111 events/year (Figure 7.13). If we breakdown the climate-related disasters of 2023, it shows flood with 61 events, storm 41 events, extreme temperatures with 5 events, and droughts with 4 events.
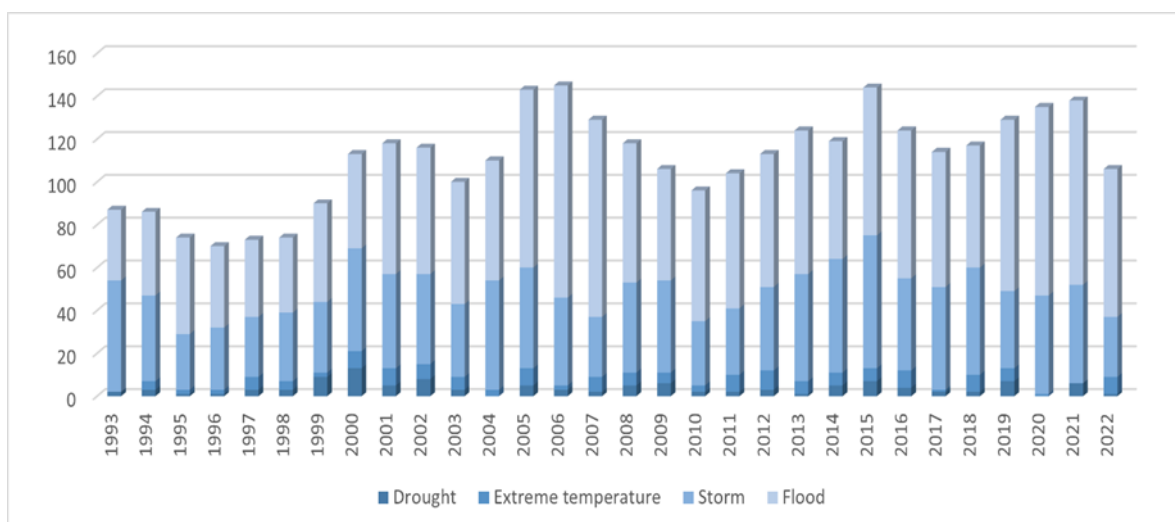
Figure 7.13 Trend of climate-related disasters in Asia 1993-2022 (EM-DAT/CRED, 2024)

As reported in the State of Climate in Asia (WMO, 2024), many parts of the region experienced extreme heat events in 2023 with Japan experiencing its hottest summer on record. Glaciers in High-Mountain Asia lost significant mass over the past 40 years, at an accelerating rate due to record-breaking high temperatures and drier conditions in the Eastern Himalayas and the Tien Shan (mountain range) in 2023. Moreover, the following climate change-related observations were noted in 2023: i) sea-surface temperature anomalies in the north-west Pacific Ocean were the highest on record; ii) South-west China suffered from a drought, with

Section 7

below-normal precipitation levels nearly every month; iii) essential winter precipitation was also below normal in the Hindu Kush region, and the rains associated with the Indian summer monsoon were insufficient. Similar to the global trend, over 80% of the hydrometeorological hazards in Asia were flood and storm events.

7.3 COVID-19 Data

In past three years, ADRC has been showing some COVID-19 data from the WHO COVID-19 Dashboard to report on the situation, such as confirmed cases, deaths, and health systems in member countries. Providing such information is useful to sustain early warning, surveillance, and travel advisories. In May 2023, many countries around the world, including Japan, had lifted all remaining COVID-19 travel restrictions (e.g., proof of vaccination to enter the country). Consequently, many countries discontinued reporting the COVID-19 situations to the World Health Organization (WHO) since 2023. In this Databook, we will show snippets of COVID-19 data from the WHO Dashboard, downloaded on 10 July 2024.

7.3.1 Global Situation

As of 2023, a cumulative total of confirmed cases of 773,940,523 (Figure 7.14) and deaths of 7,015,982 (Figure 7.15) from COVID-19 were reported. After observing the highest number of confirmed cases reported on single day at 44.20 million on 19 December 2022, COVID-19 cases had drastically declined from the beginning and until the end of 2023. Likewise, the number of deaths had also significantly declined in that year.
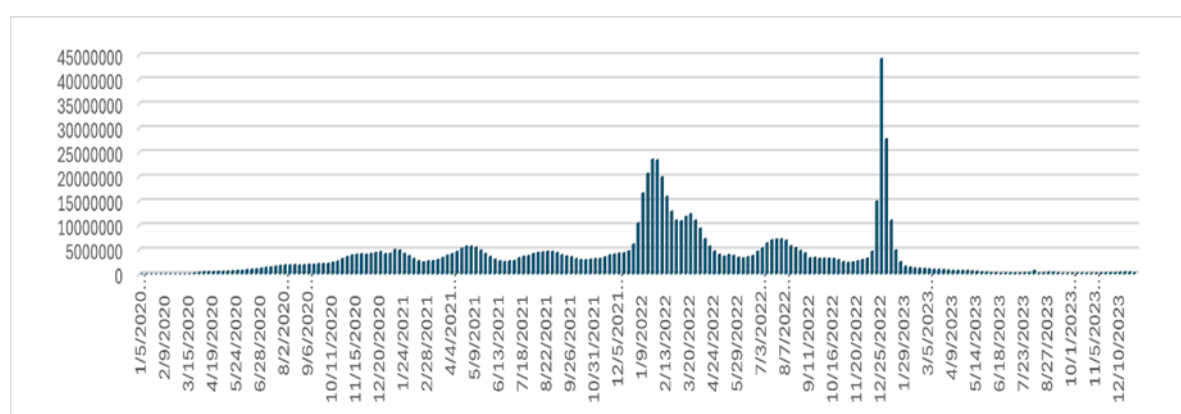

Figure 7.14 Cumulative number of confirmed COVID-19 cases as of December 2023 (WHO, 2024)
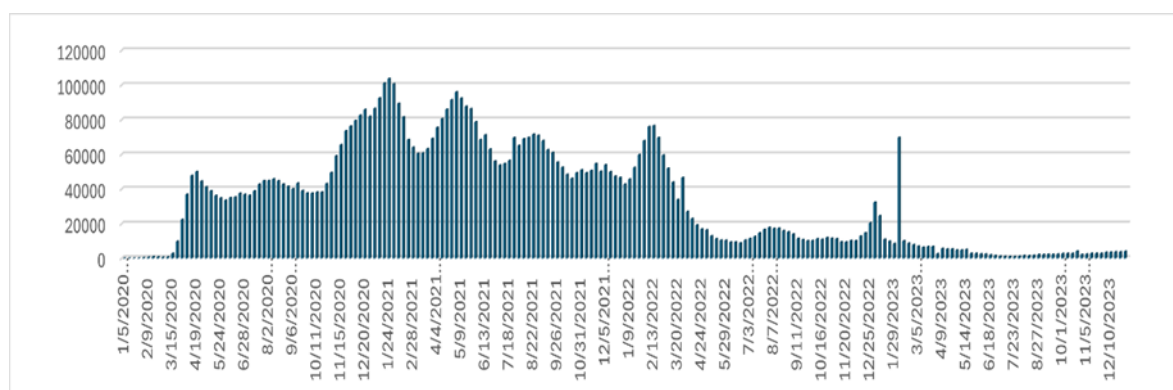

Figure 7.15 Cumulative number of COVID-19 deaths as of December 2023 (WHO, 2024)

Globally, the significant decrease in COVID-19 deaths is largely attributed to improved treatments, health measures, widespread vaccination, and natural immunity.

7.3.2   COVID-19 Situation in ADRC Member Countries

Similar to the global trend, COVID-19 situation in ADRC member countries showed significantly declining number of confirmed cases and deaths from COVID-19. Looking back at the end of 2023, the cumulative totals in the number of confirmed cases showed China reaching 99.32 million cases, India with 45.01 million cases, Republic of Korea with 34.57 million cases, Japan with 33.80 million cases, and the Russian Federation with 23.75 million cases (Figure 7.16).
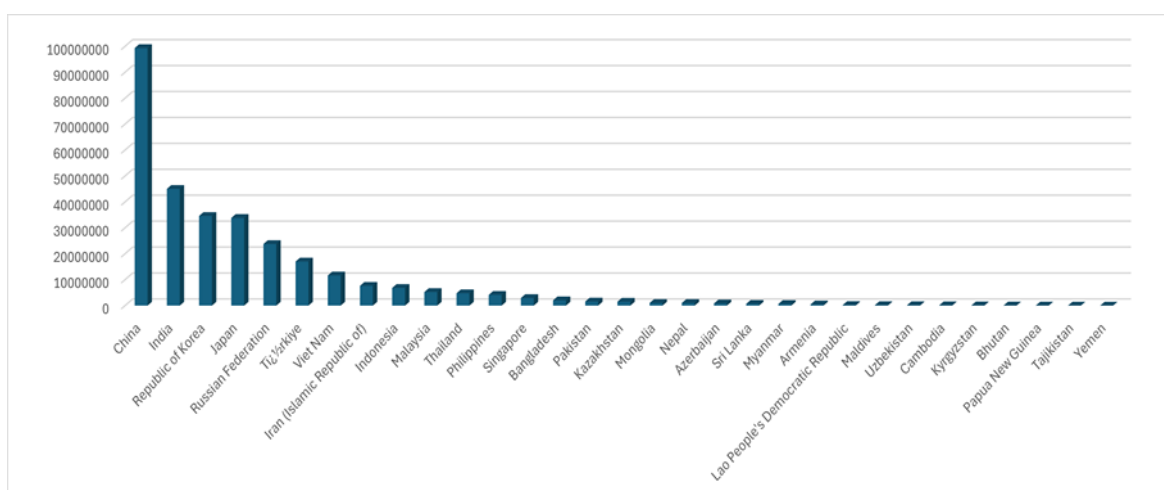

Figure 7.16 Cumulative COVID-19 confirmed cases in ADRC member countries as of December 2023 (WHO, 2024)

Following the global trend, the number of deaths from COVID-19 significantly declined in ADRC member countries since 2023. Looking back at the end of 2023, the cumulative number of deaths showed India with 533,361 deaths, Russian Federation with 401,359 deaths, Indonesia with 161,972 deaths, Iran with 146,757 deaths, and China with 121,893 deaths (Figure 7.17).
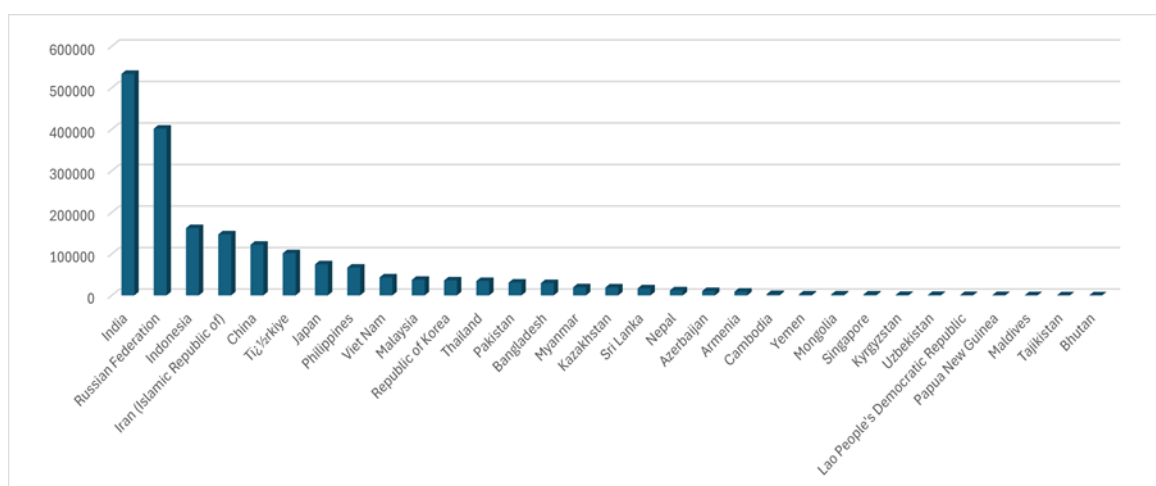

Figure 7.17 Cumulative COVID-19 deaths in ADRC member countries as of December 2023 (WHO, 2024)

Section 7

In hindsight, the declining trend of COVID-19 cases and deaths signals the greater control of the pandemic, lifting territories-imposed quarantines, entry bans, or other travel restrictions for citizens traveling to affected areas. Declining trend of COVID-19 cases also implies promising outlook for global tourism, business travels, markets, and economies.

Annexes
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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,

Annexes

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. Its status was part of the Urban Disaster Research Institute (URDI).

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.

Annexes

Overview of the 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, ASEAN, 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/CRED: The Emergency Events Database - Université Catholique de Louvain - CRED, www.emdat.be, Brussels, Belgium. Datasets were obtained on 25 March 2024, unless otherwise stated. The Natural Disaster Databook 2023 focused only on seven disaster types: drought, earthquake, extreme temperature, flood, storm, wildfire, and volcanic activity.

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

The Natural Disaster Databook 2023 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 tsunami.

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.

Annexes

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:

https://council.science/wp-content/uploads/2019/12/Peril-Classification-and-Hazard-Glossary-1.pdf

COVID-19 Data

All COVID-19 data used in the Databook 2023 is based from the World Health Organization Coronavirus (COVID-19) Dashboard, https://covid19.who.int/ accessed on 10 July 2024.

Data from the WHO COVID-19 Dashboard are from the official reporting to WHO through regional offices and also from public websites, not officially reported to WHO. Member States select the data and the reporting systems they prefer to use. Individual countries, areas, and territories may decline to allow country-level disaggregation.

In past three years, ADRC has been showing some COVID-19 data from the WHO COVID-19 Dashboard to report on the situation, such as confirmed cases, deaths, and health systems in member countries. Providing such information is useful to sustain early warning, surveillance, and travel advisories. In May 2023, many countries around the world, including Japan, had lifted all remaining COVID-19 travel restrictions (e.g., proof of vaccination to enter the country). Consequently, many countries discontinued reporting the COVID-19 situations to the World Health Organization (WHO) since 2023.

It is on this context that the COVID-19 data is presented in the Databook 2023.

Annexes