

# **1. Asian Disaster Reduction Center**

# 1. Asian Disaster Reduction Center

Established in 1998, the Asian Disaster Reduction Center (ADRC) is a regional initiative aimed at enhancing disaster resilience, building safer communities, and creating a society where sustainable development is attainable among its 31-member countries (Annex 1: History of Establishment of ADRC).

## 1.1 Key Activities

ADRC activities, as reported in its Annual Report, are focused on three pillars:

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

After 21 years of functioning as part of the Urban Disaster Research Institute (UDRI), ADRC became independent and obtained a corporate status in April 2020 following the launching of 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.



Figure 1.1 Map of member and advisor countries

### 1.2.1 Member and Advisor Countries

During its establishment, ADRC was comprised of 22-member countries, 4-advisor countries, and 1-observer organization. Gradually, the membership expanded 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, and Turkey in 2018 bringing the number of member countries to 31. In March 2004, the US joined as the fifth advisor country to ADRC (Table 1.1 Member and Advisor Countries).

Table 1.1 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, Laos 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	Turkey

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 Emergency Situations
Azerbaijan	Ministry of Emergency Situations
Bangladesh	Ministry of Disaster Management & Relief
Bhutan	Ministry of Home & Cultural Affairs
Cambodia	The National Committee for Disaster Management (NCDM)
China	National Disaster Reduction Center of China
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 and Local Government Affairs
Philippines	National Disaster Risk Reduction and Management Council (NDRRMC)
Russia	Ministry of the Russian Federation for Civil Defense, Emergencies and Elimination of Consequences of Natural Disasters (EMERCOM)
Singapore	Singapore Civil Defence Force (SCDF)
Sri Lanka	Disaster Management Centre, Ministry of Defence
Tajikistan	Committee of Emergency Situations and Civil Defense
Thailand	Department of Disaster Prevention and Mitigation (DDPM), Ministry of Interior
Turkey	Disaster and Emergency Management Presidency (AFAD), Ministry of Interior
Uzbekistan	Ministry of Emergency Situations
Viet Nam	Viet Nam Disaster Management Authority (VNDMA), Ministry of Agriculture and Rural Development (MARD)
Yemen	Ministry of Water & Environment

### 1.2.2 Partner Organizations

To contribute to the efforts of disaster risk reduction in Asia, ADRC considers a global perspective in cooperation with a variety of 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).

## **2. Highlights of FY2021**

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In the second year of the COVID-19 pandemic, much of ADRC activities, including the Asian Conference on Disaster Reduction (ACDR), were still held online.

### 2.1 Activities in Figures

Figure 2.1 below shows some of ADRC milestones in FY 2021 at a glance.

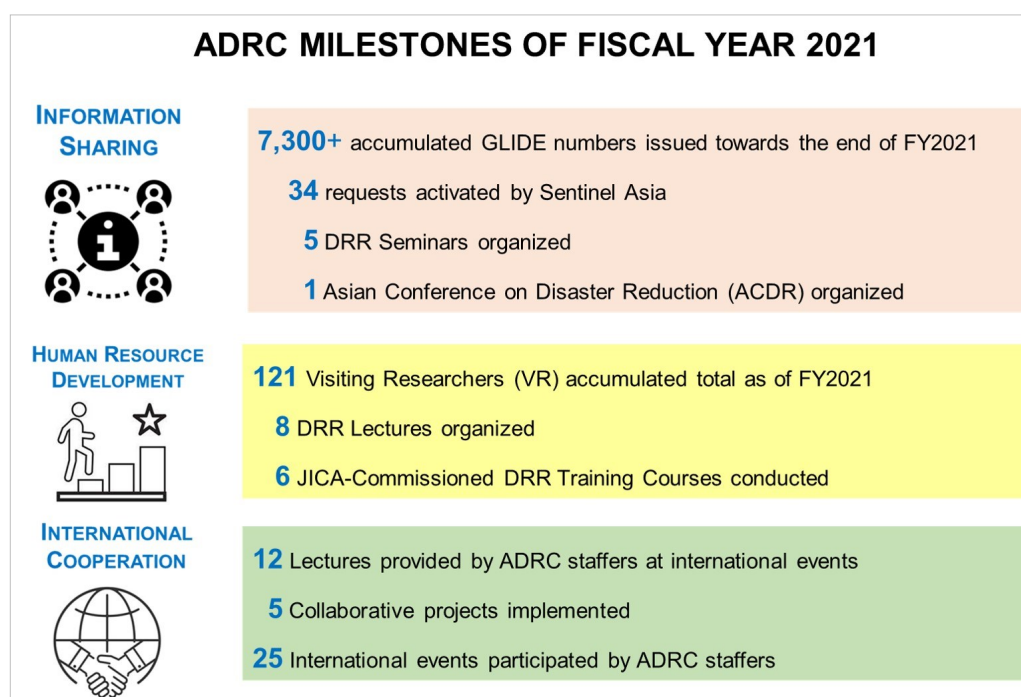


Figure 2.1 Highlights of ADRC Activities on FY 2021

### 2.2 Asian Conference on Disaster Reduction 2021

Last year, the Asian Conference on Disaster Reduction (ACDR) was held online on 14-16 December 2021 with the theme, “Time for Change and Transformation: The Road to a Resilient Asia”. ACDR2021 was an occasion for general assembly among ADRC member countries, and it also served as venue for discussions of policies, programmes, projects, activities, and approaches that could facilitate change and transformation towards a more resilient Asia. ACDR2021 included keynote speeches, high-level round table, thematic sessions, and side event.

#### 2.2.1 Opening and Keynote Speeches

At the opening, HE Mr NINOYU Satoshi (Minister of State for Disaster Management, Government of Japan) stressed that strategic DRR actions, such as investing in mitigation and awareness raising, are essential to achieve transformation towards greater resilience. HE Mr Rustam Nazarzoda (Chairman, Committee of Emergency Situations and Civil Defense, Tajikistan) emphasized the role of regional cooperation (e.g., knowledge exchange) in addressing recent DRR issues while Prof HAMADA Masanori (Chairman, Asian



Figure 2.2 Speakers who provided remarks at the Opening Session

Disaster Reduction Center) told the participants that the ACDR itself was a forum to facilitate DRR actions that could lead to better transformation.

Three different perspectives were presented during the keynote speeches. Firstly, Ms Mami Mizutori (Special Representative of the United Nations Secretary-General for Disaster Risk Reduction, Head of the United Nations Office for Disaster Risk Reduction) encouraged the governments to pursue actions that will improve climate risk data, inclusive DRR approaches, localization of DRR efforts, and financing DRR as all these contribute to the implementation of the new Asia Pacific Action Plan 2021-2024 of the Sendai Framework. Secondly, HE Dr Basuki Hadimuljono (Minister for Public Works and Housing of Indonesia) pointed that in hazard-prone countries like Indonesia, strategies that could help overcome the disaster risk management (DRM) challenges (e.g., investing in DRR, build back better approach in recovery, pre-disaster investment, early warning system, and cooperation in promoting resilient infrastructure) exist and must be scaled-up. Finally, Ms Sandra Wu Wen-Hsiu (Chairperson and CEO, Kokusai Kogyo Co., Ltd.) built the case for the private sector's role in DRR, emphasizing the sector's rich experience, skills, and resources. She stated that Emergency Agreements (EA) with national government agencies – a mechanism pioneered in Japan – is now adopted in many Asian countries and around the world.



Figure 2.3 Keynote speakers of the Asian Conference on Disaster Reduction 2021

### 2.2.2 High-Level Round Table

High-level officials who delivered statements, include: HE Mr Rustam Nazarzoda (Tajikistan), Assistant Commissioner Yazid Abdullah (Singapore), Mr Md Mohsin (Bangladesh), Dr Syamsul Maarif (Indonesia), MG G Ariunbuyan (Mongolia), Mr Muhamad Idrees (Pakistan), Secretary Delfin N. Lorenzana (Philippines), Major General Sudantha Ranasinghe (Sri Lanka), Mr Boontham Lertsukekasem (Thailand), and Mr Pham Duc Luan (Vietnam). The statements generally highlighted the following: (1) investing in DRR and climate change adaptation, (2) applying multi-hazard early warning system, (3) promoting all-of-society, inclusive, and proactive DRR approaches to ensure that no one is left behind, (4) enhancing capacity building in DRR, and (5) promoting disaster-resilient infrastructures.



Figure 2.4 Officials who delivered statements at the High Level Round Table

### 2.2.3 TS1: DRR Technologies that Meet Local Needs

Thematic Session 1 (TS1) was about developing DRR technologies that meet local needs to create safe, secure, and livable society. Dr Mandira Singh Shrestha (Programme Coordinator, Climate Services, Mountain Environment Regional Information System, ICIMOD) moderated this session, drawing insights on how technologies could contribute in transformation towards a more resilient society. Dr Hendro



Figure 2.5 Speakers of Technical Session 1 of ACDR2021

Wardhono (Director of the Board Managers, PUSPPITA, Indonesia) described how the new technologies at BNPB (e.g., InaRisk) contributed in managing a recent disaster caused by Mt. Semeru Eruption of 4 December 2021. Dr Seong Sam Kim (Team Leader, Disaster Scientific Investigation Division, Ministry of the Interior and Safety, Republic of Korea) demonstrated the use of artificial intelligence (AI) and drone mapping in detecting disaster damage and assessing the impacts of affected areas. Among the experts, Dr Hasi Bateer (General Manager, Global Business Development Division, Asia Air Survey Co., Ltd.) demonstrated the utilization of geospatial data for DRR. He cited the Red Relief Image Map (RRIM) as one example of visualising and interpreting digital imagery from satellites. Mr SUZUKI Koji (Project Director, Asian Disaster Reduction Center) showed how the Quasi-Zenith Satellite System (QZSS) early warning service could contribute towards transmitting a clear, timely, and actionable warning message directly to the communities, especially in areas where ground telecommunication systems are limited. Dr David Nguyen (Associate

Professor, International Research Institute of Disaster Science, Tohoku University) argued the need of developing an international standard (ISO) for smart community infrastructure to keep the methods simple and avoid useless operations as well as reduce costs and spread of technologies, especially in Asia.

#### 2.2.4 TS2: Education and Awareness Raising for DRR Actions

Thematic Session 2 (TS2) dealt with strengthening disaster preparedness through education and awareness-raising for promoting proactive DRR actions. Dr SAKAMOTO Mayumi (Professor, Graduate School of Disaster Resilience and Governance, University of Hyogo) moderated this session. She said that in Japan, DRR education is covered in all subjects, aiming to enhance “knowledge and



Figure 2.6 Speakers of Technical Session 2 of ACDR2021

skills”, “humanities”, and “abilities to think, judge and express”, which are considered as the three pillars of education. Dr Le Quang Tuan (Deputy Director, Department of Science Technology and International Cooperation, Vietnam Disaster Management Authority, Vietnam) introduced the CBDRM (2009-2020) activities, which included training on DRM knowledge and enhancing communication capacity of reporters, editors, and district radio/television staffers who are in-charge at the grassroots level. Ms Syuzanna Kakoyan (Head of the Department of Education, Administration of Activities with Public, Regional Survey for Seismic Protection, Ministry of Emergency Situations, Armenia) shared the “Code of Conduct on Earthquake Protection” in Armenia. The Department of Education implements the code of conduct through games, drills, and quizzes, and also works closely with mass media and private sector. In his commentary of the session, Mr FUKASAWA Yoshinobu (Secretary, TeLL-Net/Specially Appointed Professor, Kyushu Sangyo University) highlighted the importance of preserving and passing on the “live” experiences and lessons from disasters to other areas and generations. He said that sharing live lessons through oral storytelling, photographs, audiovisual materials, museums, monuments, and music are powerful means of transmitting lessons that complements the formal DRR education in schools.

#### 2.2.5 TS3: Investing in DRR for a Resilient Society

Thematic Session 3 (TS3) discussed investing in disaster risk reduction for a resilient society, where officials from ADRC member countries shared recent knowledge, perspectives, and approaches to accelerate risk-informed investments. Mr TAKEYA Kimio (Distinguished Technical Advisor on Disaster Risk Reduction, Japan International Cooperation Agency; and Visiting Professor at International Research Institute of Disaster Science, Tohoku University) moderated this session, providing an overview of practical methods of investing in DRR. Dr Renato Solidum, Jr (Undersecretary, Department of Science and Technology; and

Officer-in-Charge, Philippine Institute of Volcanology and Seismology, Philippines) reported about the “GeoRisk Philippines” as an investment in DRR to achieve greater understanding of hazards and risks. Dr Le Minh Nhat (Deputy Director of Emergency Response and Disaster Recovery Department, Vietnam Disaster Management Authority, Vietnam) presented



Figure 2.7 Speakers of Technical Session 3 of ACDR2021

the investment priorities under the National DRR Plan 2021-2025 of Vietnam. Investments include the construction of hydrological monitoring equipment for river water levels, dams, and rainfall as well as investments in water disaster prevention information system. Mr Abdul Malik Sadat Idris (Director of Water Resources and Irrigation, Ministry of National Development Planning, Indonesia) reported the Indonesia's investment in strengthening of critical infrastructures for flood resilience in 50 high-risk cities, which is integrated in the National Medium-Term Development Plan. Mr Jerry A. Fano (Assistance Core Head at Office of the Project Director, Unified Project Management Office, Department of Public Works and Highways, Philippines) shared the pre-disaster investments in flood mitigation in the Philippines. These investments include the construction and strengthening of flood control structures (e.g., flood gates, flood walls, and spillways) that reduced flood inundation and economic damage by 85%.

## 2.2.6 Closing Messages

At the closing, Mr MURAKAMI Takeo (Director, International Cooperation Division, Disaster Management Bureau, Cabinet Office, Government of Japan) pointed that Cabinet Office Japan organized a side event titled, “Public and Private Seminar for Disaster Risk Reduction”, at the ACDR2021 to promote DRR technologies of Japanese companies. He also encouraged ADRC member-



Figure 2.8 Speakers at the Closing of ACDR2021

countries to strengthen investments in DRR along with COVID-19 recovery as integral part of National DRR Strategy and in support of the Mid-Term Review of the Sendai Framework in 2022. Dr OGAWA Yujiro

(Executive Secretary, ADRC) formally closed the conference with message that member-countries must strive to accelerate efforts on implementing the Sendai Framework for Disaster Risk Reduction to help overcome intensifying disaster risks.

## 2.3 Online DRR Seminar Series

To support the thematic discussions leading to the Asian Conference on Disaster Reduction (ACDR2021), ADRC organized a series of Online DRR Seminars.

### 2.3.1 Seminar 1: Investing in DRR for a Resilient Society

**Date:** 15 June 2021

**Theme:** Investing in Disaster Risk for a Resilient Society

**Number of Participants:** 300 from 20 countries

#### **Key Messages:**

- Dr Jun Rentschler, Senior Economist at the World Bank, said that "investing in resilience is sound, profitable, and urgent." He supported this claim with evidence-based case studies and statistics showing that every \$1 invested in infrastructure resilience results in \$4 in net benefit. He argued that investing in resilience is urgent concern and delaying such action is causing an estimated loss of \$100 billion in one year.
- Mr Ronald Jackson, Head of DRR and Recovery for Building Resilience Team at UNDP-Geneva, presented UNDP's "Signature Solutions", a Programme that implements six cross-cutting approaches to development: poverty, governance, resilience, environment, energy, and gender. Mr Jackson cited examples of disaster risk mitigation projects under this Programme, such as in Pakistan (water conservation), Belize (gender and livelihoods), Ukraine (community-based disaster risk mitigation), Iran (climate change adaptation planning), and Rwanda (awareness raising).
- Prof NISHIKAWA Satoru at the Disaster Mitigation Research Center of Nagoya University stressed the importance of "pre-disaster" actions or investments in DRR based on the outcomes of empirical studies and lessons from past disasters in Japan. He said that after World War 2, Japan was in ashes and infrastructure recovery was impeded and even further damaged by the impacts of typhoons. In order to prevent future typhoon damage, Japan invested in flood control using funds borrowed from the World Bank. Since then, Japan has strengthened investments in DRR by regularly evaluating what went wrong and went right with pre-disaster countermeasures.



Figure 2.9 Speakers of Seminar 1 on 15 June 2021

- Mr NAKAGAWA Masaaki, Executive Director of ADRC, moderated the discussions and offered two key takeaways at the closing. First, funds for DRR should not be seen as an expense but as an investment. It was clear from the presentations, and affirmed during the discussions, that \$1 in DRR investment would render \$4 in benefits. Moreover, DRR investments are not always infrastructure investments. Stakeholders can also invest in planning, policies, regulations, databases, and nature-based solutions. Second, DRR investments must be people-centered. As observed in the past, investments focused on economic growth could expand income inequality, such that poor people remain disproportionately affected by disasters or global pandemics.

### 2.3.2 Seminar 2: Education and Awareness Raising for DRR Actions

**Date:** 13 July 2021

**Theme:** DRR Education and Awareness Raising through the Passing Down of Lessons from Past Disasters

**Number of Participants:** 281 from 18 countries

**Key Messages:**

- Prof MURAMOTO Toshiaki (IRIDeS, Tohoku University) introduced an innovative educational method that could provide an opportunity for students to perceive disasters as "their own business". This method involves: (1) interdisciplinary lectures at school; (2) visits to disaster-affected areas and opportunities to hear the stories from 'kataribe'/storytellers and interacting with victims; (3) group work to identify challenges for earthquake recovery and to explore ways to solve those challenges; and (4) planning and execution of lectures on DRR for other students based on their learning.
- Ms Vanda Lengkong (Plan International Asia Pacific Regional Office) reported the ASEAN Safe School Initiative (ASSI) in partnership with the civil society organizations (CSOs). The initiative creates space to discuss and share school safety technical resources, approaches, and sound practices to minimize the impacts of disasters on children and the education sector. This initiative is unique in that the elements included in the formal educational system are supplemented with DRR educational activities for children and parents in the community (e.g., puppet show).
- Dr Sébastien Boret (IRIDeS, Tohoku University) pointed to the importance of museums and monuments as methods of DRR education, particularly in promoting "collective memory." He cited the example of Aceh Tsunami Museum in Indonesia, which functions not only as a center for education and learning but



Figure 2.10 Speakers of Seminar 2 on 13 July 2021

also as a memorial, an evacuation building, and an activity space where the community can gather and interact.

- Mr NAKAGAWA Masaaki, ADRC's Executive Director, concluded the event by noting that the methodologies of DRR education are most effective at encouraging proactive learning and action when they are appropriate for a given context and aligned with a community's culture and practices.

### 2.3.3 Seminar 3: Technologies that Meet Local Needs

**Date:** 14 September 2021

**Theme:** Developing DRR Technologies that Meet Local Needs to Build a Safe, Secure, and Lively Society

**Number of Participants:** 116 participants from 23 countries

#### **Key Messages:**

- Dr ONO Takahiro (Director, Mitsubishi Corporation Insurance) said that standardization is important to keep methods simple, avoid useless operations, and facilitate smooth communication.
- Mr Sanjaya Bhatia (Head of Office, UNDRR-GETI) discussed how UNDRR-GETI is engaged in developing the ISO standards for the sustainable development of communities to make cities resilient (MCR). He highlighted the following ISO standards: Indicators for City Services and Quality of Life (ISO 37120); Indicators for Smart Cities (ISO 37122); and Indicators for Resilient Cities (ISO 37123).
- Dr David N. Nguyen (Associate Professor, Tohoku University and Researcher at NIED) reported on the progress of the work of the ISO Technical Committee in identifying and planning for smart community infrastructures that enhance DRR. He highlighted the community infrastructures from Australia, Chile, Colombia, Germany, Greece, Japan, and Turkey.
- Mr HIRUMA Yoshiki (Vice President, Sustainability Management at the Development Bank of Japan, DBJ) discussed the application of financing methodologies to design a resilient future. One example is the utilization of pre-disaster mitigation in business continuity management (BCM) among small and medium enterprises (SMEs) to enhance safety.
- Mr Pradeep Kumara Kodippili (Deputy Director, Disaster Management Centre in Sri Lanka) gave a presentation on the disaster early warning systems in Sri Lanka. He described the capacity of his office, the Disaster Management Centre (DMC), as having 77 early warning towers, High Frequency (HF) and Very High Frequency (VHF) communication, intra-government network (IGN), and disaster early warning network (DEWN) system that could send text messages.



Figure 2.11 Speakers of Seminar 3 on 14 September 2021

### 2.3.4 Seminar 4: GLOF Impact to the Local Economy and Measures

**Date:** 28 September 2021

**Theme:** GLOF Impact to the Local Economy and Countermeasures

**Number of Participants:** 88 participants from 14 countries

**Key Messages:**

- Mr ARAKIDA Masaru (Director of Research Department at ADRC) moderator of the session by focusing on three questions: Is the number of GLOF events increasing due to climate change? How does GLOF impact the local economy? What are the disaster risk reduction measures for GLOF?
- Ms Finu Shrestha (Analyst, Remote Sensing and Geo-information Geospatial Solutions, ICIMOD) presented some research findings using remote sensing techniques: (1) a total of 25,614 glacial lakes, in five major river basins of HKH, as recorded as of 2018; (2) of this total, 47 are potentially dangerous glacial lakes (PDGLs); (3) mass movement are the main factors for dam failure in the Eastern and Central Himalaya; (4) temperature and extreme rainfall cause GLOF in the region; and (5) the frequency distribution of GLOF events in the last 4 decades varies every decade, making it difficult to predict its occurrence.
- Dr Mandira Singh Shrestha (Programme Coordinator, Climate Services, Mountain Environment Regional Information System, ICIMOD) stressed the importance of integrating risk assessment, risk analysis, and risk mitigation in the risk reduction strategy for GLOF (e.g., using Earth Observation to assess, monitor, and understand the risk of GLOF). While it is difficult to predict the occurrence of GLOF, systematic and continuous monitoring of mountainous environments could offer robust knowledge, and could strengthen the capacity for early warning.
- Mr NAKAGAWA Masaaki (Executive Director, ADRC) mentioned that the risks from climate-related hazards such as GLOF could further intensify. Therefore, it is important to reframe the disaster risk management (DRM) approach by focusing not just on single hazard at a time but by adopting a multi-hazards approach.

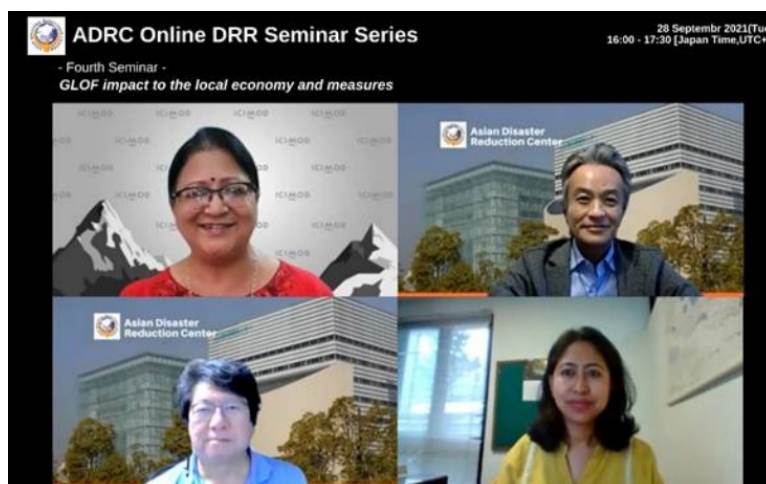


Figure 2.12 Speakers of Seminar 4 on 28 September 2021

### 2.3.5 Seminar 5: Promoting Disaster Mitigation Strategies

**Date:** 18 October 2021

**Theme:** Promoting Disaster Mitigation Strategies for Urban Resilience

**Number of Participants:** 127 from 14 countries

**Key Messages:**

- Mr KORESAWA Atsushi (Regional Representative for Asia and the Pacific, UN-Habitat) introduced the Cities and Climate Change Initiative (CCCI) that supports cities in responding to the negative impact of climate change by putting emphasis on participatory processes, sound analysis, sustainable urban planning, good governance, responsive leadership, and practical initiatives at all levels.
- Ms Pragma PRADHAN (Country Programme Manager, UN-Habitat Nepal) highlighted the recovery and mitigation strategies of preserving the heritage settlements, which were damaged during the 2015 Nepal Earthquake. Ms Pradhan pointed out two key lessons. First, development efforts must be complemented with disaster risk reduction (DRR) efforts to safeguard lives and properties through risk informed spatial development planning, infrastructure investments, and economic activities that caters to the need of all. Second, urban resilience is multi-dimensional that entails strengthening of social, economic, institutional, and spatial aspects.
- Mr Ibani PADA0 (Chief, Monitoring and Evaluation Division DHSUD, Philippines) reported that since the local governments are at the frontline in the implementation process, the national government of the Philippines has provided relevant tools and guidelines to resiliency planning. These include: Mainstreaming Guidelines for Local Land Use and Shelter Plans; Climate and Disaster Risk Assessment (CDRA) Tool; and National Guide for Climate Resilient Urban Plans and Designs.
- Mr Christopher ROLLO (Country Programme Manager, UN-Habitat Philippines) presented the case of Legazpi City in developing and implementing the adaptation strategy for flood hazard. Legazpi city utilized the government's resiliency tools/guidelines to come up with systematic and evidence-based structuring (e.g., designing sites and buildings that promotes structural resilience, safety of people and facilitates evacuation and rescue).
- Ms PANNAPA Na Nan (Director, International Cooperation Section, DDPM Thailand) reported that the Department of Disaster Prevention and Mitigation (DDPM) has been constantly improving its disaster mitigation efforts following the 2011 floods that greatly impacted the country. For instance, DDPM leverages international cooperation support, particularly through the ASEAN Committee on Disaster



Figure 2.13 Speakers of Seminar 5 on 18 October 2021

Management (ACDM) and AHA Centre in implementing urban resilience projects (e.g., community-based flood management project).

- Mr NAKAGAWA Masaaki (Executive Director, ADRC), who moderated the event, mentioned that building disaster resilient society is the overarching theme of the upcoming Asian Conference on Disaster Reduction (ACDR) that would further provide an opportunity to discuss other initiatives and actions to promote disaster resilience.

## 2.4 Tsunami Seminar 2021

On 9 March 2022, ADRC held an Online Tsunami Seminar FY2021, and invited Assistant Professor Mauricio Reyes Gallardo from the University of Valparaiso in Chile. He gave a lecture entitled "Experience with Tsunami Risk Reduction in Chile." In terms of disaster risks, he noted that Chile is a multi-hazard country, with earthquakes and tsunamis being the most notable hazards as experienced in 1960, 2007, 2010, and 2015. Tsunami experiences in Chile offered opportunities to improve and



Figure 2.14 Prof Mauricio Gallardo of the University of Valparaiso in Chile

strengthen tsunami risk management through: 1) technological improvements in early warning systems 2) the development and adoption of the National Building Code as well as the Reinforcement Code; and 3) the application of "Sistema Nacional de Alerta de Maremotos" (SNAM) and "Sistema Integrado de Predicción y Alarma de Tsunamis" (SIPAT) to keep people informed about tsunami risks and help provide guidance relating to evacuation and safety measures. Despite improvements in tsunami risk management, Prof Gallardo said that Chile remains vulnerable to tsunamis due to the following factors: lack of urban planning; societal, ecological, economical, and cultural complexities; lack of education; poor use of technology; and poorly maintained infrastructure. He concluded that good risk governance is needed for establishing systems that can bring order to the complexities of tsunami risk. Mr NAKAGAWA Masaaki, Executive Director of ADRC, concluded the seminar by saying that ADRC would promote tsunami disaster risk reduction through sharing of experiences and lessons in Japan and other countries.

## 2.5 Innovation of the GLIDE Number System

The GLIDE number system, which gives common but unique numbers to disasters all over the world, does not only support the integration of DRR data in each country, but it also improves the efficiency of retrieval of information on historical and on-going disasters from various databases across different countries and organizations. This system is continually improving through further studies and institutional arrangements.

### 2.5.1 Study on Promoting GLIDE

Once a disaster occurs, an operator of a GLIDE member organization issues a GLIDE number by inputting disaster information such as location, time, disaster type, initial damage. The GLIDE number being issued appears on the GLIDE website, and is also emailed automatically to over 2,000 subscribers. So far, over 7,300 GLIDE numbers have been issued. ADRC continues to conduct study on addressing technical and practical issues to efficiently promote the utilization of GLIDE, including its Standard Operating Procedures (SOP).

#### Key Results

- 100% of guidance is accepted and approved by GLIDE Secretariat
- 100% of guidance is available through the GLIDE website
- 100% of new/existing GLIDE operators understand where to find documentation
- 75% of new/existing operators surveyed indicate that the Glide operator guidance is easy to understand (visual) and use
- Video tutorials are completed and available for five key topics

Figure 2.15 Slide on Study of Promoting GLIDE

### 2.5.2 Establishment of the Steering Committee

The GLIDE Steering Committee (SC) was established on 30 June 2021 to facilitate sustainable operation, and during its establishment, the first SC Meeting was held online. A total of 17 participants from 9 founding and new partner organizations participated in the meeting. Prof ONO Yuichi was selected as the first chair and ADRC as Secretariat. The main outcome of the first meeting was the establishment of three subcommittees: Standard Operating Procedure (SOP), Application Programming Interface (API), and Product Development. The Second SC Meeting took place on 8 December 2021 with participation of 13 people from 6 organizations. In that meeting, the subcommittees reported their activities and proposals.

#### Activities 2021

##### 1<sup>st</sup> Steering Committee

30 June 2021

Online

18 participants (17 SC members, 1 observer)

Confirmed the basic role of SC Chair, Secretariat, Members and Observers

Tohoku Univ Prof Ono nominated and selected as SC Chair

Establishment of Subcommittees to engage in thematic and technical issues

- API Subcommittee (Mr Julio Serje, IFRC/ARC, ADRC)
- SOP Subcommittee (OCHA, ADRC)
- New Product Development Subcommittee (Mr Julio Serje, EU/JRC, IFRC, Tohoku Univ)

Figure 2.16 Slide presented during the SC Meeting on 30 June 2021

### **3. Information Sharing on DRR**

### 3. Information Sharing on DRR

ADRC collects and disseminates disaster risk reduction (DRR) information, primarily on its website (<https://www.adrc.asia>), to provide member countries and the general public of documented experiences, lessons, tools, and practices that maybe useful for preparedness, mitigation, response, and recovery activities.

#### 3.1 Information Collection

Supported by its 31-member countries, ADRC collects information on DRR systems, plans, and policy measures based on each country's disaster risk situations. Additionally, ADRC collects information from other countries and organizations in collaboration with the Visiting Researchers (VRs) and the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA). The basic DRR information that ADRC collects are:

- 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)

##### 3.1.1 Country Reports on DRR

Member countries regularly provide reports and information on DRR to ADRC Secretariat, which manages the database. To facilitate sharing, ADRC disseminates DRR related website links and other relevant information among member countries and partner organizations. The updated record of country reports for FY 2021 is shown in Table 3.1.

Table 3.1. Years Country Reports Updated as of FY2021

Country	Year Prepared (Information frequently updated by VRs)
Armenia	2001, 2002, 2003, 2005, 2006, 2010, 2012, 2015 2016, 2017
Azerbaijan	2011, 2014
Bangladesh	1998, 1999, 2001, 2003, 2005, 2006, 2010, 2011 2013, 2020
Bhutan	2008, 2013, 2014, 2017, 2019
Cambodia	1998, 1999, 2002, 2003, 2005, 2006, 2013
China	1998, 1999, 2005, 2006, 2012
India	1998, 1999, 2002, 2005, 2006, 2008, 2012, 2015 2018
Indonesia	1998, 1999, 2002, 2003, 2004, 2005, 2006, 2012 2016
Iran	2013
Japan	1998, 1999, 2002, 2005, 2006, 2012, 2015, 2016, 2017, 2018, 2019
Kazakhstan	1998, 1999, 2002, 2005, 2006

Country	Year Prepared (Information frequently updated by VRs)
Korea	1998, 1999, 2001, 2002, 2005, 2006, 2008
Kyrgyzstan	2005, 2006, 2012
Laos	1998, 1999, 2003, 2005, 2006
Malaysia	1998, 1999, 2003, 2005, 2006, 2008, 2009, 2011 2018
Maldives	2013, 2014, 2015, 2018
Mongolia	1998, 1999, 2002, 2005, 2010, 2011, 2013
Myanmar	2002, 2005, 2006, 2013, 2018, 2020
Nepal	1998, 1999, 2005, 2006, 2009, 2010, 2011, 2014 2019
Pakistan	2005, 2006, 2009, 2015, 2016, 2017
Papua New Guinea	1998, 1999, 2005, 2006
Philippines	1998, 1999, 2002, 2003, 2005, 2006, 2009, 2010, 2011, 2012, 2014, 2016, 2017, 2018
Russia	1998, 1999, 2003, 2005, 2006
Singapore	1998, 1999, 2001, 2002, 2003, 2005, 2006
Sri Lanka	1998, 1999, 2003, 2005, 2006, 2009, 2010, 2011, 2014, 2015, 2016, 2019
Tajikistan	1998, 1999, 2003, 2005, 2006
Thailand	1998, 1999, 2003, 2004, 2005, 2006, 2008, 2010, 2011, 2012, 2016, 2017, 2018, 2019, 2020
Turkey	2019
Uzbekistan	1998, 1999, 2005, 2006, 2013, 2015
Vietnam	1998, 1999, 2005, 2006, 2017
Yemen	2009, 2012, 2014

In FY 2021, the reports from member countries continued to put emphasis on DRR activities during COVID-19 pandemic. Some of the reports were written as thematic papers, which were submitted and presented at the Asian Conference on Disaster Reduction (ACDR) 2021.

### 3.1.2 Latest Disaster Information

Information on latest disaster and its updates are regularly posted on ADRC website (Figure 3.1). In particular, the date of occurrence, location, impacts, and links to reports, articles, maps, relief efforts, and satellite images are among the basic information that are included in the updates. The sources of these information are from ADRC counterparts, partner organizations, and networks (e.g., media, governments, international organizations, research institutions and civil societies). For instance, ADRC updates the information based on the materials provided by the ReliefWeb (operated by UNOCHA), United States Geological Survey (USGS), and other media information, including government agencies.

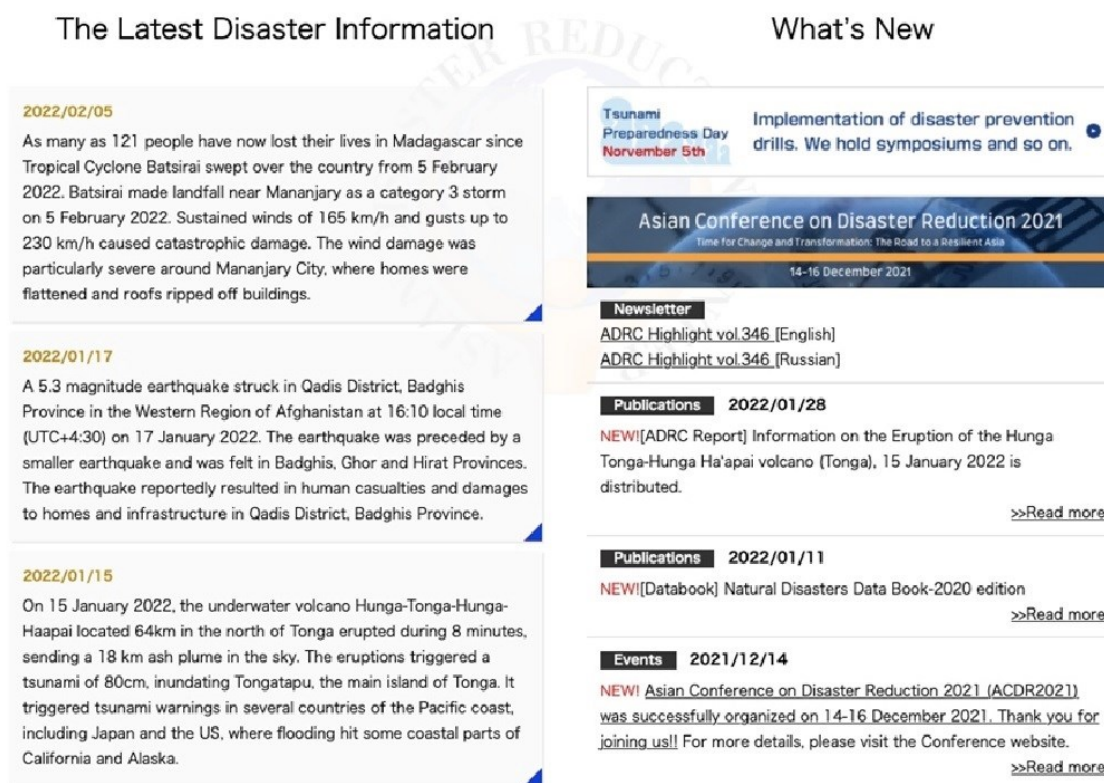


Figure 3.1 Latest Disaster Information on ADRC Website

The five most notable disasters in FY2021, as shown on the ADRC website, included:

- **Floods in India, June to September**

In Western India, severe flooding and landslides was experienced in Maharashtra State starting in June 2021. As of 28 July, the death toll increased to 209, according to the National Emergency Response Centre. About 8 people were missing, 52 injured, 434,150 displaced (over 251,300 to 308 temporary relief centres), and more than 382,650 people were affected across ten districts. Heavy rain continued until September 2022 over northern and coastal Maharashtra. <https://bit.ly/indiaLF2021>

- **Henan Flood in China, July**

More than 144,660 residents were affected by torrential rains in Henan Province of Central China, 16-20 July 2021. It was reported that 10,152 people were relocated to safe places. <https://bit.ly/HenanFL2021>

- **Nuristan Flood in Afghanistan, July**

On 28 July 2021, massive flash floods, triggered by heavy rain, occurred in Mirdesh village in Kamdesh district in Nuristan province – eastern part of Afghanistan. Around 150 were reported missing and 113 people were found dead. Around 300 residential houses were impacted with 200 houses fully damaged. One public bridge and four small bridges were also damaged. The flood swept away cattle and livestock, destroyed agricultural lands, and demolished a large part of a road in Kamdesh district. <https://bit.ly/AfghanFL2021>

- **Typhoon Rai in the Philippines, December**

Typhoon Rai (Local name: Odette) slammed southeastern part of the Philippines on 16 December 2021, bringing heavy rains and flooding that displaced thousands over a large area. It rapidly intensified to a Category 5 storm before making landfall. It killed 405, injured 1,371, missing 52, affected 7.8 million, and evacuated 114,943 people. Over 2 million houses were totally/partially destroyed and about 1,734 infrastructures were damaged. <https://bit.ly/PHILFL2021>

- **Volcanic Eruption and Tsunami in Tonga, January**

The Hunga Tonga Hunga Ha'apai (HTHH) Volcanic Eruption and the induced tsunami waves which hit Tonga in the evening of 15 January 2022 resulted in the displacement of about 2,390 people and 465 households. About 54.41% of affected households were in Tongatapu, 30.54% in Ha'apai Islands, and 15.05% in 'Eua.

<https://bit.ly/TongaVL2022>

The set of disaster information provided on the ADRC website is comprehensive due to wide range of reliable ADRC partners that provided the data.

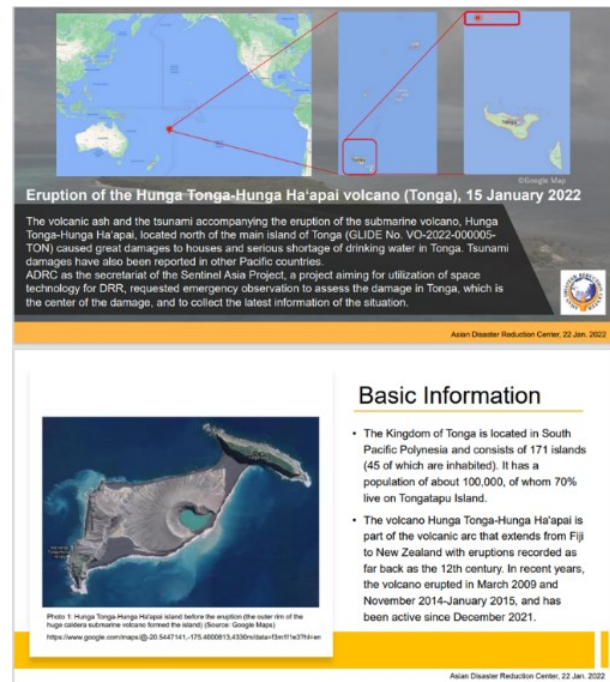


Figure 3.2 ADRC presentation on HTHH Volcanic Eruption of 15 January 2022

### 3.1.3 Natural Disaster Databook

ADRC obtained data from EM-DAT and analyzed it to show the occurrence, death tolls, people affected, and economic impact of disasters during the year 2020 (but reported and published in FY2021). In addition, the analysis also included two other sets of data. One pertains to data on climate-related disasters, and the another pertains to data COVID-19 situations. In general, the Natural Disaster Databook 2020 presented three data perspectives:

- Natural disaster data of 2020 is compared with the annual average of disaster data of the past three decades (i.e., 1990-2019) at the global level and at the Asian level

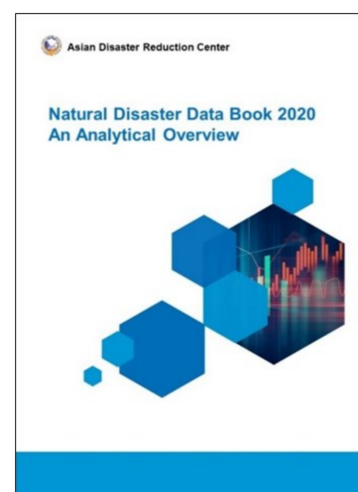


Figure 3.3 Cover of Natural Disaster Databook 2020

- Climate-related disasters of 2020 is compared with the annual average of the past three decades (i.e., 1990-2019) at the global level and at the Asian level
- COVID-19 situation (i.e., using cumulative data of confirmed cases and deaths) is presented at global level as well as in the ADRC member countries

The analysis of disaster data was presented in a form of infographic. For instance, in 2020, the economic losses from disasters (excluding losses from COVID-19) was USD173.1 billion. This number was higher compared to the annual average of USD108.5 billion of economic losses from disasters in the last three decades (Figure 3.4).

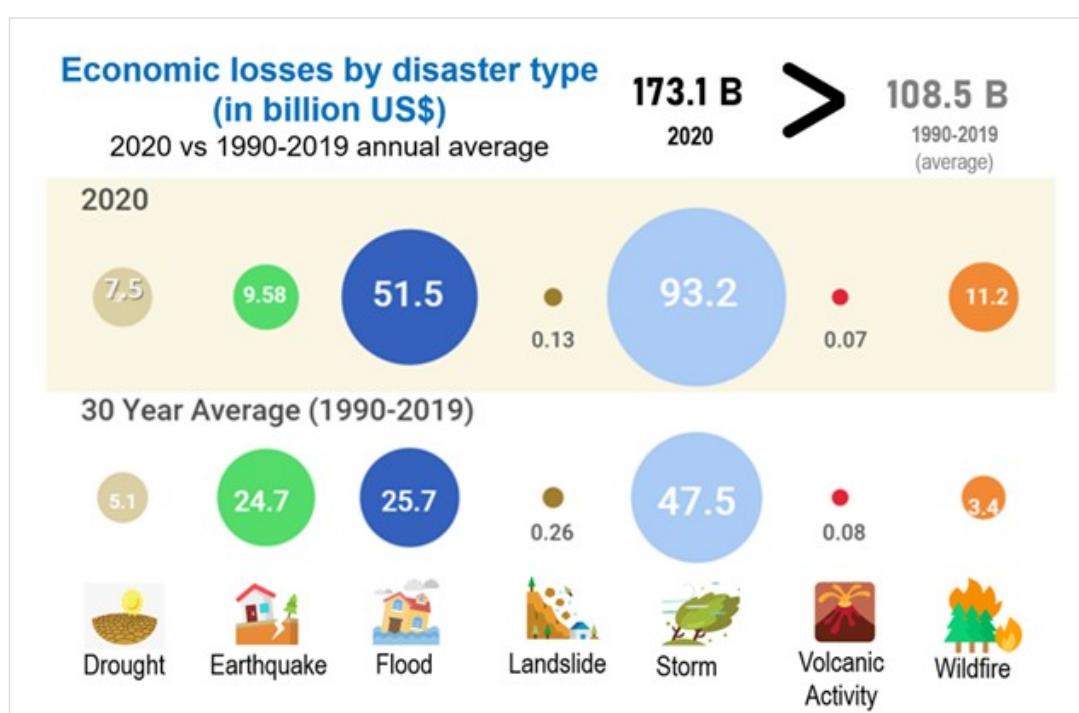


Figure 3.4 Economic losses by disaster type 2020 vs 1990-2019 annual average

Some highlights of the Natural Disaster Databook 2020 could be mentioned here. Firstly, flood and storm had been the most frequent causes of disasters in 2020 as well as during the last 30 years. These two disaster types also account for the highest number of people affected and the highest economic losses in 2020 and in the last 30 years. This observation indicates that disaster risk reduction and management actions for flood and storm need further improvements. Secondly, flood and storm (unlike earthquake) are climate-related disaster types that show the tendency of frequently occurring, as observed in 2020 and during the last 30 years. This observation is notable not only globally, but also, in Asia. Thirdly, as of 21 September 2021, the number of confirmed cases and deaths from COVID-19 had peaked in several occasions since the World Health Organization (WHO) declared the pandemic on 11 March 2020. The highest peak so far was on 26 April 2021, recording a total of 5,695,585 COVID-19 confirmed cases globally on that day. Although some western countries rolled out vaccines, there emerged some COVID-19 variants (e.g., delta variant) that might have contributed to the increasing number of confirmed cases. In ADRC

member countries, cumulative data shows that COVID-19 situation was varied, reflecting the differences in policies as well as socioeconomic conditions of Asian countries.

### 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, c) dissemination through Sentinel Asia and space-based platforms, and d) sharing of information at conferences and learning events.

#### 3.2.1 ADRC Highlights

Since 1 June 1999, ADRC has been issuing the ADRC Highlights for information dissemination. For eight years (until FY 2007), the ADRC Highlights had been issued twice a month. However, following the renewal of its design in the beginning 2008, it has been issued monthly and published in three languages: English, Japanese, and Russian.



Figure 3.5 ADRC Highlights issued in three different languages

As of 28 February 2022, there are 2,329 subscribers for English edition, 915 for Japanese edition, and 229 for Russian edition. The newsletters are available on ADRC website and also disseminated by email in English, Russian, and Japanese languages to ADRC counterparts, former visiting researchers, former GLIDE visiting researchers, participants in the past ADRC annual meetings, visitors to ADRC, trainees in JICA's training courses which ADRC conducted, and participants of international conferences which ADRC is engaged. The contents include articles on the latest ADRC activities, reports on participation in international conferences, and other events in which ADRC staff members attended and gave presentations. Reports by ADRC Visiting Researchers from member countries and interns are also covered in the newsletter.

### 3.2.2 Data Sharing through GLIDE Number System

As of FY 2021, over 7,300 GLIDE numbers have been issued. GLIDE (operated by ADRC and other partners including the United Nations, international partner organizations, and researcher institutions) is a disaster identifier system that is commonly formatted but has unique numbers to disasters to support the integration of disaster risk reduction (DRR) data as well as improve the efficiency of retrieving historical and on-going disaster information from various databases across different countries and organizations. Figure 3.6 shows a list of GLIDE numbers with the disaster and geographic information. Once a GLIDE number is issued, it is shared to some 2,000 registered users in the world and applied to their databases and products.

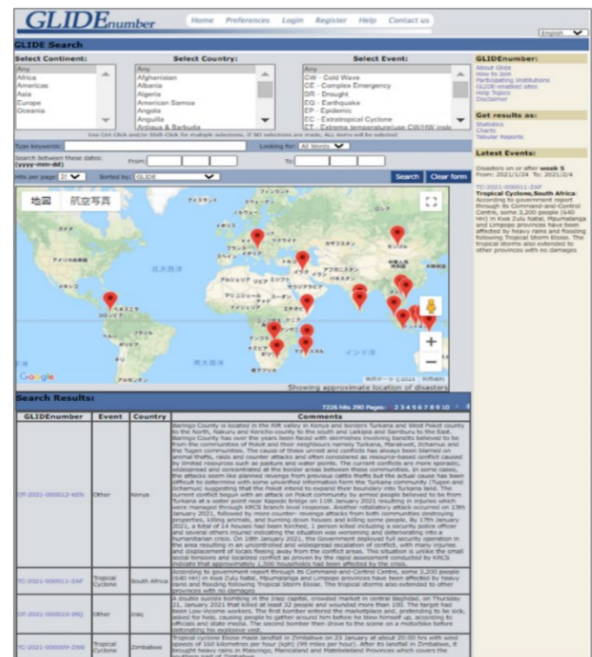


Figure 3.6 GLIDE Information on its Website

### 3.2.3 Data Sharing through Sentinel Asia

As of January 2022, a total of 111 organizations from 28 countries and region join the Sentinel Asia. In accordance with the Cooperation Agreement between the United Nations Office for Outer Space Affairs (UNOOSA) and ADRC signed on 4 June 2009, ADRC has been established as a UN-SPIDER Regional Support Office (RSO) operated by its staff members as coordinators. In spite of year-to-year changes in the number of requests, the ratio of activated numbers remains stable at around 80%.

In 2021, Sentinel Asia received 34 requests from JPT members and 34 were activated in 2021. Looking at the breakdown of the number of disaster observations by country and region from 2007 to 2021 (Figure 3.8), Indonesia requested the most at 60. This is followed by 56 requests from Vietnam and 50 requests from the Philippines, indicating that Southeast Asian countries occupy the top positions. Floods represent the largest number of disasters with 212 requests (50.1%), followed by earthquakes at 54 (12.8%), typhoons at 36

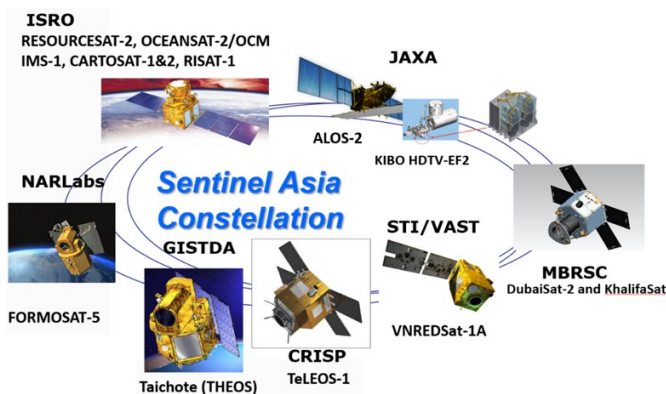


Figure 3.7 Data Provider Nodes of Sentinel Asia

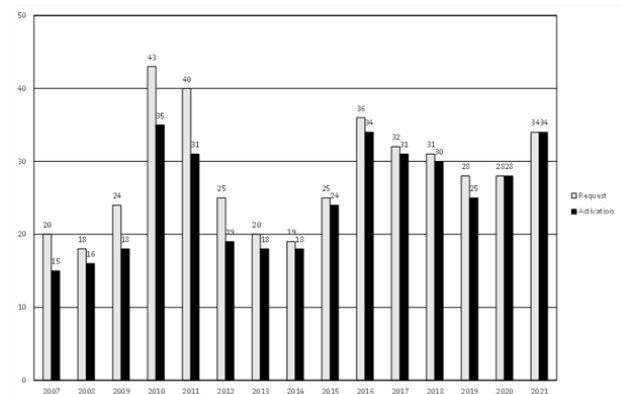


Figure 3.8 Emergency Observations 2007-2021

## **4. Human Resource Development**

## 4. Human Resource Development

To enhance disaster risk management (DRM) capacities in member countries, ADRC promotes human resources development (HRD) through the Visiting Researchers (VR) Programme, seminars, workshops, and training events on disaster risk reduction.

### 4.1 Visiting Researchers (VR) Programme

As of October 2021, an accumulated total of 121 visiting researchers have participated in the programme from 27 countries since 1999. In principle, VRs are expected to spend around three months at ADRC. During this period, VRs will be engaged in their own research activities, such as comparing disaster management systems between their countries' and Japan, participating in various DRR events, and visiting relevant organizations in Japan. These activities provide VRs the opportunities to learn about disaster management systems and practices of Japan and other countries.

#### 4.1.1 Activities During the Programme

VRs for FY 2021 included: 1) Ms Gevorgyan Ani, Armenia; 2) Ms Batjargal Ariuntungalag, Mongolia; 3) Ms Thai Huong Minh, Vietnam; and 4) Mr Asghar Ali Jamali, Pakistan (Figure 4.1). During the programme, VRs learn the latest knowledge and technology on DRR and international cooperation of Japan. VRs do not only contribute to the strengthening of the DRR capacity in their countries, but they also further promote cooperation between their countries and ADRC.





	Ms. Gevorgyan Ani *FY2021	31	Armenia	Head of Complex Department for Seismic Hazard Assessment	非常事態省 地震防災部局	Seismic monitoring, Seismic hazard and seismic risk (地震防災分野における地震評価)
	Ms. Batjargal Ariuntungalag *FY2021	36	Mongolia	Chemist researcher of disaster research institute (DRI)	国家危機管理庁	Innovative Emergency shelter for disaster (災害のための最新緊急シェルター)
	Ms. Thai Huong Minh *FY2021	37	Vietnam	Expert on Disaster Risk Reduction	ベトナム防災総局	Community Based Disaster Risk Management, esp (CBDRMの研究、日本を事例にして)
	Mr. Asghar Ali Jamali *FY2021	32	Pakistan	Deputy Director	国家災害管理委員会	Disaster Risk Reduction and Disaster Risk Management (防災と災害管理)

Figure 4.1 Visiting Researchers of FY2021

#### 4.1.2 Networking of Visiting Researchers

ADRC taps the network of former VRs in order to carry out ongoing projects effectively and efficiently. Additionally, ADRC taps them to design new projects that meet the local conditions. Furthermore, through the former VRs, ADRC extends support to the member countries to effectively implement their DRR activities. For instance, during the Asian Conference on Disaster Reduction (ACDR) that was held on 14-16 December 2021, a number of former VRs served as speakers in various sessions. In particular, Ms Syuzanna Kakoyan

(VR 2016, Armenia) presented in one session that dealt with strengthening disaster preparedness through education and awareness-raising for promoting proactive DRR actions, where she shared the “Code of Conduct on Earthquake Protection” in Armenia (Figure 4.2)

Former VRs (e.g., Bhutan, Bangladesh, and Mongolia) also served as expert respondents in the survey that ADRC conducted about the *Satellite Report for Disaster and Crisis Management* (DC Report) using the Quasi-Zenith Satellite System (QZSS) – a Japanese constellation of Global Navigation Satellite System (GNSS).

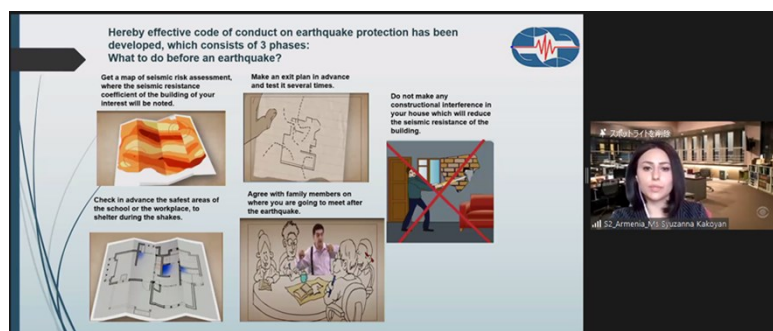


Figure 4.2 Ms Syuzanna Kakoyan, Visiting Researcher FY 2016

#### 4.1.3 DRR Lecture Series

Although ADRC could not conduct its activities in a normal format in FY2021 due to the global pandemic, ADRC initiated the DRR Lecture Series where Japanese experts provide lectures in a wide range of topics to expand knowledge among DRR researchers and practitioners. In March 2022 alone, eight lectures were organized (Figure 4.3). The topics, include:

- Disaster Management in Japan
- Mainstreaming Disaster Risk Reduction
- Flood Disaster Management
- Local Flood Disaster Countermeasures
- Earthquake Disaster Management
- Landslide Disaster Management
- School DRR Education
- Inclusive Disaster Risk Reduction



Figure 4.3 List of ADRC DRR Lectures

## 4.2 JICA Knowledge Co-Creation Programme: “Comprehensive Disaster Risk Reduction”

JICA commissioned ADRC to conduct comprehensive training courses on DRR, which are designed based on themes of interests in each region/country. In FY2021, three comprehensive DRR courses were implemented for the African region, Central Asia and Caucasus, and Asian region in general.

#### 4.2.1 Comprehensive Disaster Risk Reduction for the African Region

**Duration:** 27 September to 28 October 2021

**Number of Participants:** 23

**Contents:** DRR in Japan, 8 Steps in formulating local DRR plan



Figure 4.4 Discussions among trainees using Miro

A total of 23 participants from the countries of Algeria, Cabo Verde, Cote D'Ivoire, Egypt, Eswatini, Mozambique, South Africa, and Sudan had completed this training course, which was conducted using an English language. Participants were officials from the central and local governments in charge of disaster management. The training was an occasion for participants to share knowledge and experience to strengthen the disaster risk reduction programs of their respective institutions. In light of the COVID-19 pandemic, the training (which include lectures and workshop for formulating local DRR plan using online whiteboard "Miro") was conducted online for the first time.

#### 4.2.2 Comprehensive Disaster Risk Reduction for Central Asia and Caucasus

**Duration:** 4 November to 2 December 2021

**Number of Participants:** 10

**Contents:** DRR in Japan, 8 Steps in formulating local DRR plan

Trainees, who participated in this course, are the countries of Georgia, Kazakhstan, Kyrgyz, Turkmenistan, and Uzbekistan. The course was conducted in Russian for central and local government officials in charge of disaster management in Central Asia and the Caucasus with the aim of sharing knowledge and experience

to strengthen government institutions in charge of disaster risk reduction. In light of the outbreak of the pandemic, the training was conducted online for the first time, including lectures and workshop for formulating local DRR plan.

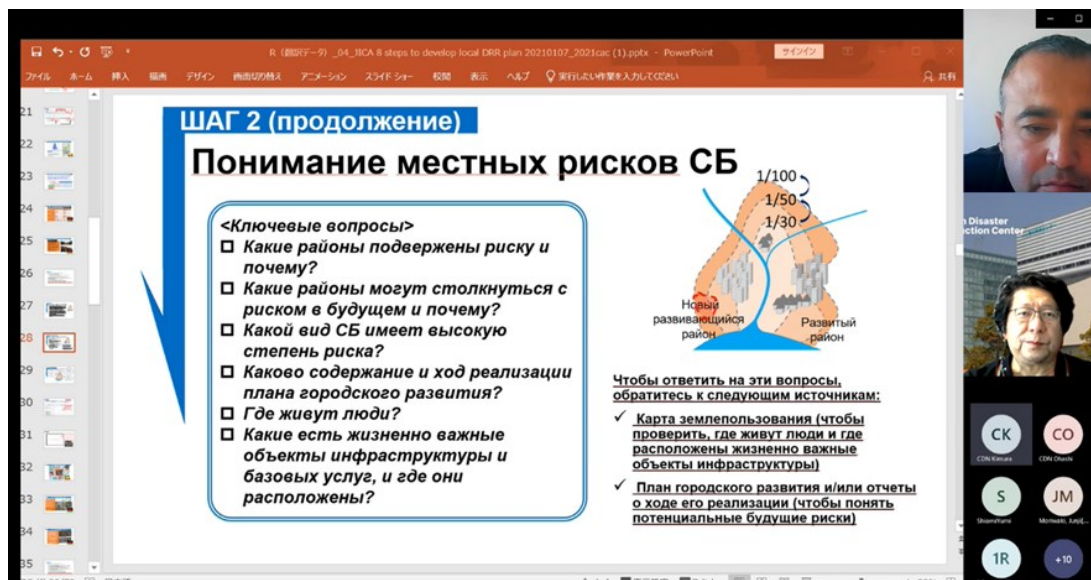


Figure 4.5 Presentation of 8-Step in formulating local DRR strategy

### 4.2.3 Comprehensive Disaster Risk Reduction

**Duration:** 11 January to 15 February 2022

**Number of Participants:** 5

**Contents:** DRR in Japan, 8 Steps in formulating local DRR plan

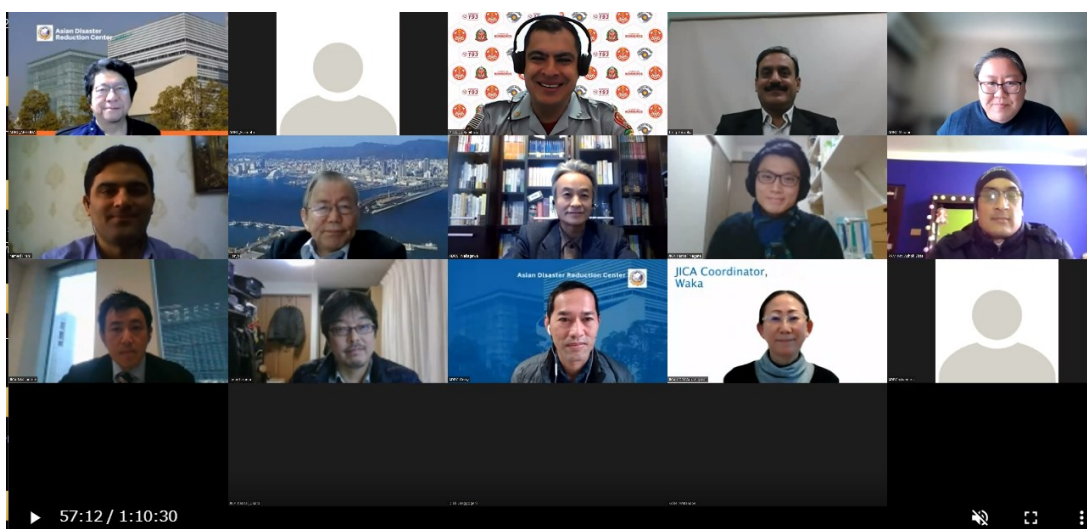


Figure 4.6 Participants and trainers of the Comprehensive DRR Course

Participants in this training course were from Brazil, Indonesia, Iran, Nepal, and Pakistan. The course was conducted in English for central and local government officials in charge of disaster management in the world with the aim of sharing knowledge and experience to strengthen government institutions in charge of disaster risk reduction. In light of the outbreak of the pandemic, the training was conducted online including lectures and workshop for formulating local DRR plan.

#### 4.2.4 Comprehensive Disaster Risk Reduction for Latin America

**Duration:** 12 July to 13 August 2021

**Number of Participants:** 28

**Contents:** DRR in Japan, 8 Steps in formulating local DRR plan



Figure 4.7 Screenshot of Comprehensive DRR training for Latin America

Participants in this training course were from Bolivia, Chile, Colombia, Dominican Republic, Guatemala, Honduras, Mexico, Nicaragua, Panama, and Peru. The course was conducted in Spanish for central and local government officials in charge of disaster risk reduction in the Latin America with the aim of sharing knowledge and experience to strengthen government institutions in charge of disaster risk reduction. In light of the COVID-19 pandemic, the training was conducted online including lectures and workshop for formulating local DRR plan.

#### 4.3 JICA Knowledge Co-Creation Programme: Promotion of Mainstreaming Disaster Risk Reduction in the World and ASEAN

Another JICA-commissioned training events that ADRC conducted in FY 2021 was the JICA Knowledge Co-Creation Programme: Promotion of Mainstreaming DRR in the ASEAN.

### 4.3.1 Mainstreaming Disaster Risk Reduction in the World

**Duration:** 15-25 November 2021

**Number of Participants:** 8

**Contents:** DRR in Japan, 8 Steps in formulating local DRR plan



Figure 4.8 Mainstreaming DRR training for the ASEAN in November 2021

Participants in this training course were from Bangladesh, Indonesia, Nepal, and Philippines. The course was conducted in English for central and local government officials in charge of DRR and budget (treasury) with the aim of sharing knowledge and experience for the mainstreaming DRR. In light of the outbreak of the pandemic, the training was conducted online including lectures and workshop for making action plan for mainstreaming DRR.

### 4.3.2 Mainstreaming Disaster Risk Reduction in ASEAN

**Duration:** 7-16 March 2022

**Number of Participants:** 10

**Contents:** DRR in Japan, 8 Steps in formulating local DRR plan

Participants in this training course were from Brunei Darussalam, Cambodia, Malaysia, Philippines, Singapore, Thailand, and Vietnam. The course was conducted in English for central and local government officials in charge of DRR and budget (treasury) in ASEAN with the aim of sharing knowledge and experience for the mainstreaming DRR. In light of the outbreak of the pandemic, the training was conducted online including lectures and workshop for making action plan for mainstreaming DRR.

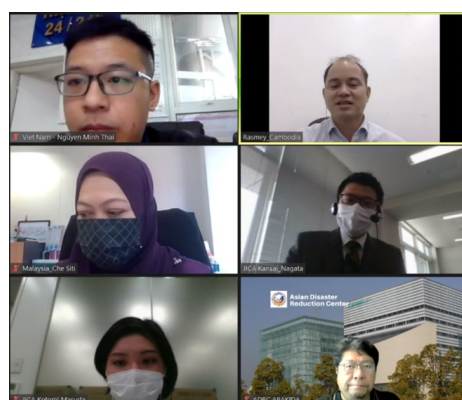


Figure 4.9 Mainstreaming DRR training for the ASEAN in March 2022

## **5. Cooperation and Partnerships**

## 5. Cooperation and Partnerships

In order to advance disaster resilience, ADRC forges cooperation and partnerships among member countries and partner organizations, including conducting joint research and organizing learning events.

### 5.1 Research Cooperation

Research projects that started to get implemented in FY2021 include topics pertaining to the use of satellites for early warning, capacity building in DRR, climate downscaling, and application of Mobipack software.

#### 5.1.1 QZSS Feasibility Studies

In collaboration with the Asia Air Survey, ADRC conducted a survey among 10 experts from member countries. The survey pertains to Satellite Report for Disaster and Crisis Management (DC Report) using the Quasi-Zenith Satellite System (QZSS) – a Japanese constellation of Global Navigation Satellite System (GNSS). Since QZSS has the capacity to send warning information using the space satellites, it is expected to offer greater application in remote and mountainous areas with poor coverage of ground-based telecommunications networks. It would also augment the ground telecommunication systems that are vulnerable to service disruptions during extreme disaster events. Survey outcomes offer insights on designing the QZSS early warning service to effectively support evacuation and response activities (Figure 5.1). In view of this project, the Cabinet Office of Japan (in partnership with ADRC) is initially inviting the following countries to participate in the feasibility studies and actual demonstrations: Chinese Taipei, Cambodia, Indonesia, Malaysia, Philippines, Thailand, Bangladesh, Nepal, Australia, and Fiji.

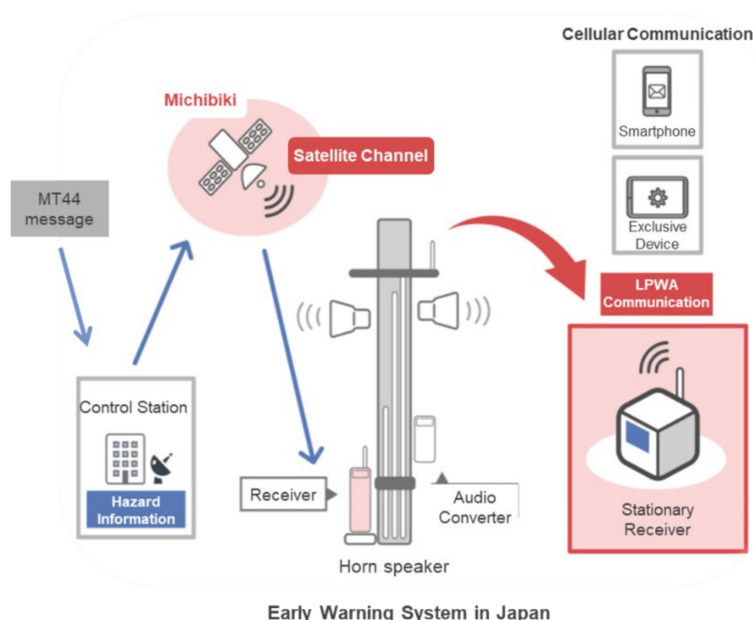


Figure 5.1 Flow of early warning service using QZSS in Japan

#### 5.1.2 Knowledge Co-creation in CDRR

In cooperation with JICA, ADRC conducted the research project pertaining to “Knowledge Co-Creation Programmes on Comprehensive Disaster Risk Reduction (DRR)”. This project covers subject-specific training programmes targeted to the five regions: Asia, Latin America, Central Asia and Caucasus, Africa, and island countries. The project is aimed at clarifying the policy for “Comprehensive DRR” training in line with the implementation of the Sendai Framework for Disaster Reduction (2015-2030). Outcomes of this project are expected to improve the contents of JICA’s comprehensive disaster risk reduction training course,

and make it more effective in promoting the DRR activities based on the Sendai Framework for Disaster Risk Reduction (Figure 5.2).

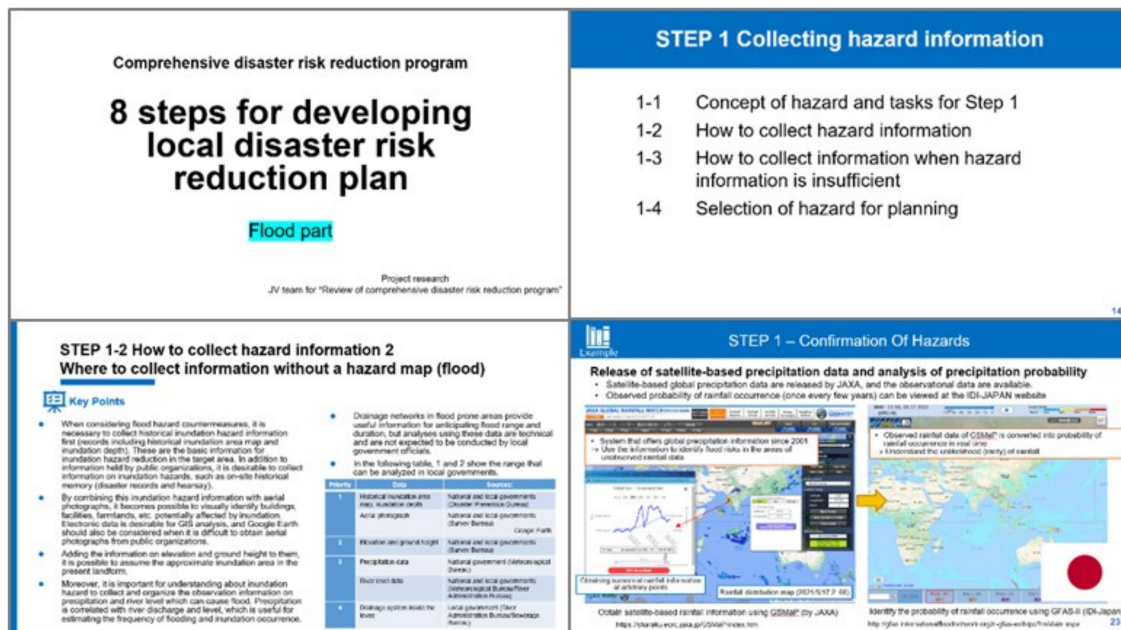


Figure 5.2 Presentation of project outcomes on improving training contents

### 5.1.3 ERIA Research Project

Through the Economic Research Institute for ASEAN and East Asia (ERIA), ADRC conducted a research project titled, "Study on Disaster Resilience Policies and Measures for Sustainable Economic Growth in ASEAN Region". Under this project, three Japanese experts prepared papers to provide policy advice pertaining to economic damage from disasters in the ASEAN region, disaster resilience of private sector of Japan, and investment in disaster risk reduction for sustainable development.

#### 5.1.4 Climate Downscaling Study

Some researchers at ADRC participate in the study on downscaling of climate change impact projection under the banner of Advanced Study of Climate Change Projection (SENTAN) with Kyoto University as the leading research agency. The research comprises five components: 1) Hazard Integration Model, 2) Hazard Mechanism, 3) Hazard Event Attribution, 4) International Collaboration, and 5) Adaptation Strategy. As of December 2021, a total of 119 researchers have engaged in the project to contribute in achieving the project goals (Figure 5.3).

## Goals

- Multi hazard model development for storm and flood hazards
- Impact projections on disaster climate information, water resources, and ecosystems due to extreme weather by global/down-scaled warmings
- Analysis on changes of hazards depending on the level of global/down-scaled warming
- Down-scaled climate change impact projections in Japan and the regions of Asia and the Pacific
- Develop a framework/platform for strategic application of disaster climate information to climate change adaptation measures



Figure 5.3 Goals of climate downscaling study

### 5.1.5 World Bank Tech-Emerge Resilience Project Termination

Upon recommendation of the Government of Himachal Pradesh in India, the project to strengthen emergency response using Mobipack (an open source analysis software developed by the University of Tokyo) was terminated in the middle of August 2021 due to unforeseen policy challenges from the National Government of India. In that project, it was recalled that whenever a mobile phone subscriber sends a message or makes a call, his or her location is indicated in the call detail record (CDR), which the telecommunications companies store in their databases. Mobipack can access and process the CDR data from the telecommunications company, and can visually show on a dashboard of a computer screen people's movement in near real-time. This data could help inform the disaster risk management (DRM) agency's decision to take appropriate actions, such as: (i) issuing early warning to people going to hazardous locations, (ii) monitoring disaster hotspots and infection outbreaks, (iii) informing evacuation operations, and (iv) informing the distribution of relief goods and supplies. It was the Himachal Pradesh State Disaster Management Authority (HP-SDMA) that coordinated the supposed installation of Mobipack in local telecommunications companies, covering the entire 12 districts.

## 5.2 International Engagements and Partnerships

Annually, ADRC is engaged in a range of international/regional events and activities to strengthen partnerships and cooperation in disaster risk reduction.

### 5.2.1 APEC-EPWG

ADRC has been serving as co-chair of the APEC Emergency Preparedness Working Group (EPWG), and had organized and participated in the following activities in FY 2021:

- **17th EPWG Meeting, 20-21 May 2021**

In this meeting, the EPWG discussed: 1) initiatives in responding to COVID-19; 2) EPWG Strategic Plan 2021-2024 and EPWG TOR; 3) APEC Putrajaya Vision 2040 Implementation Plan; 4) Cross-Fora collaboration; and 5) capacity building projects.

ADRC Executive Director Mr NAKAGAWA Masaaki presented the “Major Disaster Events and Disaster Risk Reduction (DRR) Policy Implementations During COVID-19 Pandemic” at the meeting.

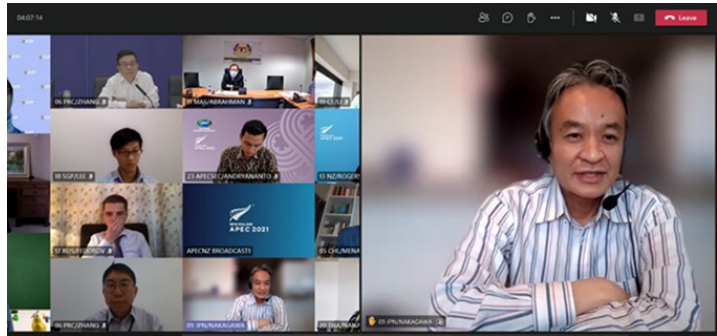


Figure 5.4 Screenshot of 17th EPWG Meeting

- **14th Senior Disaster Management Officials Forum (SDMOF-14), 26 May 2021**

SDMOF-14 discussions revolved around two major themes: 1) DRR polices including preparedness, response, and recovery measures in light of the COVID-19 pandemic, and 2) inclusive and balanced participation in disaster management. Outcomes of the first thematic discussion highlighted the importance of improving risk governance by considering the lessons from concurrent crises.

Outcomes of second thematic discussions, which was moderated by Dr Gerry Potutan of ADRC, highlighted three common actions in promoting inclusive and balanced participation in disaster management: 1) empowering communities to act in disaster management; 2) forging joint-strategies among government agencies; and 3) strengthening partnerships and collaboration.



Figure 5.5 Screenshot of 14th SDMOF

- **Workshop on Enhancing Participation in Flood Disaster Preparedness Through Community-based Hazard Mapping, 17 June 2021**

Organized by the University Putra Malaysia, the Global Environment Centre, and the Malaysian Water Partnership, ADRC presented the “Town Watching” method developed by ADRC Executive Secretary Professor OGAWA Yujiro, and explained its applications to some 50 participants from APEC economies.

- **Workshop for APEC Disaster Risk Management Strategies to Support MSMEs Business Sustainability, 24-26 August 2021**

ADRC sent resource speaker in this workshop, which was organized by Universiti Utara Malaysia (UUM). The event was aimed at increasing MSMEs coping capacity through capacity building Programme and private-public partnership and to recommend policy to support MSMEs recovery after a disaster. ADRC presented the “Policies and Practices of Japan to Support MSMEs DRM”, which was favorably welcomed by the participants.

- **Workshop on Better Risk Monitoring and Assessment for A Risk-informed Regional Economic Integration, 23-24 September 2021**

EPWG-China hosted this workshop, and ADRC sent two representatives, namely Mr NAKAGAWA Masaaki (Executive Director of ADRC) and Dr Gerry Potutan (Senior Researcher of ADRC) to serve as panelists. One session dwelt on Better Disaster Risk Monitoring and Assessment moderated by Ms Fengmin Kan (Former Regional Chief, Asia-Pacific Regional Office, UNDRR) and the other was about Inclusive DRR for Resilience Building moderated by Mr Sanny Ramos Jegillos (Senior Advisor/ Team Leader, Disaster Risk Reduction and Recovery for Building Resilience, Bangkok, Thailand). The two-day workshop brought together policymakers, experts, scientists, academia, and practitioners to share experiences on better disaster risk monitoring and assessment, risk-smart businesses, and community-based DRR in the post COVID-19 pandemic. Outcomes of the event offered insights on activities that contribute towards a risk-informed regional economic integration in the post COVID-19 world.



Figure 5.6 Screenshot of workshop hosted by EPWG-China

## 5.2.2 ASEAN

Engagements of ADRC in the activities related to the Association of the Southeast Asian Nations (ASEAN) and the AHA Centre in FY2021 include the following:

- **6th AADMER Partnership Conference, 8 June 2021**

The ASEAN Agreement on Disaster Management and Emergency Response (AADMER) is a document that presents the mechanisms for effective disaster risk reduction and calls for strengthening regional and international cooperation on disaster risk reduction efforts in order to mitigate the damage caused by natural hazards in the 10 ASEAN countries. In this partnership




Figure 5.7 ADRC Executive Director NAKAGAWA Masaaki at the Conference

conference, ADRC Executive Director NAKAGAWA Masaaki gave a statement highlighting the contributions of ADRC's DRR projects, such as the GLIDE system for sharing disaster information, ADRC efforts to strengthen networks among ASEAN countries, and the ERIA (Economic Research Institute for ASEAN and East Asia) research project.

- **AHA Centre Executive (ACE) Programme, 17 November 2021**

This event was jointly organized by the AHA Centre and Kobe University to showcase the latest DRR technology transfer to DRR organizations. ADRC presented the following in one of the sessions: 1) Outline of the Sentinel Asia, 2) Trend of Emergency Observation Request, and 3) How to register disaster information into the OPTEMIS system.



**Session on Sentinel Asia:**  
"Space-based disaster risk management support for the benefit of the Asia-Pacific region"

Time (JST)	Agenda Item	Speaker/Moderator	Annotation
15:00- 15:05	Opening	Dr. Ramanditya Wibardana	➤ opening and introduction of speakers
15:05- 15:20	Keynote Presentation	Mr. MIYOSHI (Sentinel Asia Secretariat)	➤ significance of space technologies for disaster management ➤ explanation on "Sentinel Asia" ➤ support from Japan-based JPT members <i>including those who are not at this session</i> (membership, their pivotal roles)
15:20- 15:40	Hands-on Session: "Sentinel Asia Web-GIS"	Ms. TAKAKURA (JAXA)	➤ overview of Web-GIS based products (comparison between a bare VAP and a VAP combined with Web-GIS)
15:40- 15:50	How to make an Emergency Observation Request (EOR) to Sentinel Asia	Dr. IKEDA (ADRC)	➤ explanation on the flow of EOR ➤ how to make an EOR (including how to determine the AOI and fill in the form) ➤ invitation to the simulation training program on EOR using Sentinel Asia's system "OPTEMIS" to be schedule on 19 November (from 16:30-JST) for those who are currently or might be responsible for making EORs
15:50- 16:20	Extraction of building footprints from satellite data ~ theory and hands-on practice~	Prof. MIYAZAKI (University of Tokyo)	➤ usefulness of building footprints for assessing damages caused by natural disasters ➤ general theory: how to extract building footprints from satellite data ➤ demonstration of an application, followed by hands-on session using the application ➤ Sentinel Asia's plan for this initiative (including possible cooperation with NSPO) ➤ invitation for participants in the session to join this initiative (citing prerequisites, terms and conditions as well)

Figure 5.8 Agenda of the Sentinel Asia Session in the ACE Programme

- **Public-Private Seminar on Innovative Policies and Technologies for Disaster Risk Reduction, 29 March 2022**

The Cabinet Office of Japan, the ASEAN Secretariat, and in collaboration with ADRC organized this seminar to support the implementation of AADMER Work Programme 2021-2025. ADRC Executive Director NAKAGAWA Masaaki presented the GLIDE (Global unique disaster IDentifier) and also highlighted other innovative engagements of ADRC, such as Sentinel

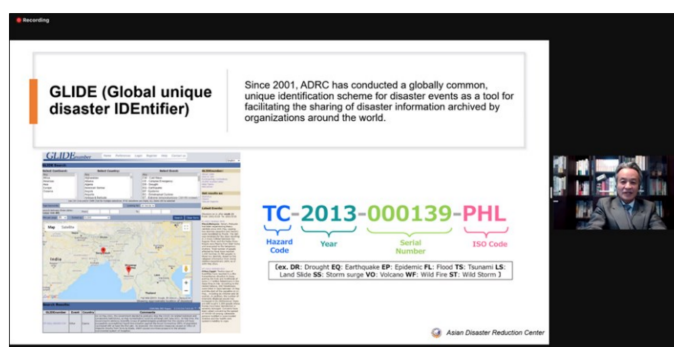


Figure 5.9 ADRC presentation at the Public-Private Seminar

Asia, Quasi-Zenith Satellite System-Early Warning Service (QZSS-EWS), Visiting Researchers Programme (VR), Comprehensive DRR Training along with JICA, and Town Watching for DRR during this event. Outcomes of the seminar are expected to contribute to the implementation of the AADMER Work Programme 2021-2025 and the development of the ASEAN-Japan Work Plan on Disaster Management 2021-2025.

- **ASEAN-Japan Work Plan: Workshop on Collaborative Actions, 23 March 2022**

This workshop was jointly organized by the Cabinet Office of Japan and ASEAN Secretariat. ADRC supported this event by sending resource persons. In this workshop ACDM focal points discussed the identified concrete activities to be incorporated into the ASEAN-Japan Work Plan (e.g., capacity building, evidence-based DRR, and community-based DRR).

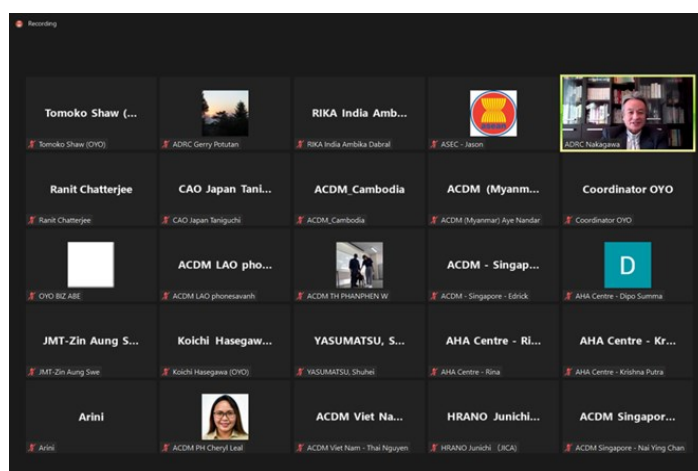


Figure 5.10 ADRC presentation at the Workshop

### 5.2.3 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 request as well as participate in related activities.

- **International Disaster Charter Online Training, 3 February 2022**

ADRC participated in the International Disaster Charter Online Training held on February 3 in 2022, and received a lecture on the latest status of the International Disaster Charter and how to register data in COS-2 system.



Figure 5.11 Screenshot of a presentation in the IDC online training

- **27th Session of the Asia-Pacific Regional Space Agency Forum, 30 Nov - 3 Dec 2021**

This session was co-organized by the Vietnam Academy of Science and Technology, the Ministry of Education, Culture, Sports, Science and Technology (MEXT), and the Japan Aerospace Exploration

Agency (JAXA). APRSAF has four Working Groups: (1) Space Applications Working Group (SAWG); (2) Space Technology Working Group (STWG); (3) Space Environment Utilization Working Group (SEUWG); and (4) Space Education Working Group (SEWG). ADRC is a member of the Space Applications Working Group (SAWG) and reported on trends in Sentinel Asia emergency observation requests and its future action plans during the session.

### Satellite Applications for Societal Benefit Working Group (SAWG)

November 30<sup>th</sup>-December 1<sup>st</sup>, 2021  
12:00 – 16:15 in Vietnam Time (UTC+7)  
14:00 – 18:15 in Japan Time (UTC+9)

#### AGENDA

##### Co-Chair:

Dr. Vu Anh Tuan, Vice Director General, Vietnam National Space Center (VNSC, VAST)  
Mr. HIRABAYASHI Takeshi, Senior Chief Officer of Earth Observation Missions (JAXA)

DAY 2: December 1 <sup>st</sup>	
TIME	SESSION / TITLE
12:00-13:30	<b>Sentinel Asia for Disaster Management Session</b> Co-Chair: Dr. KAWAKITA Shiro
12:00[15min]	• Sentinel Asia - Trend of Emergency Observation Request -, Mr. IKEDA Makoto (ADRC)
12:15[15min]	• Sentinel Asia Status Report, Mr. TAKEI Goro (JAXA)
12:30[15min]	• NSPO-NARLabs Engagement in Sentinel Asia, Dr. Franz Ming-Chih Cheng (NARLabs)
12:45[15min]	• Integration of Satellite data and Crowdsourced information through a Mobile App for the Sentinel Asia, Dr. Manzul Kumar Hazarika (GIC/AIT)
13:00[15min]	• Development of Mirror Target Calibration for Optical Satellite Data, Prof. NAGAI Masahiko (Yamaguchi University)
13:15[15min]	• Using Earth Observation to help Pacific countries managing disaster risk reduction and response, Dr. Kargren Rafael (Pacific Earth Observation Council)

Figure 5.12 Agenda of the SAWG Session in the 27th Session of APRSAF

#### • **5th Symposium on Human Resource Development and Space Data Utilization for Disasters, 25 January 2022**

ADRC participated in this symposium, which was jointly organized by Yamaguchi University and Udayana University. ADRC made a presentation about Sentinel Asia and the Activation of Emergency Observations, explaining how emergency observations are requested during disasters and how to become a member of the Sentinel Asia Programme. About 70 experts, representing local disaster management organizations, Tokyo University, the National Research Institute for Earth Science and Disaster Resilience, and the organizing institutions (Yamaguchi University and Udayana University) participated in this symposium.

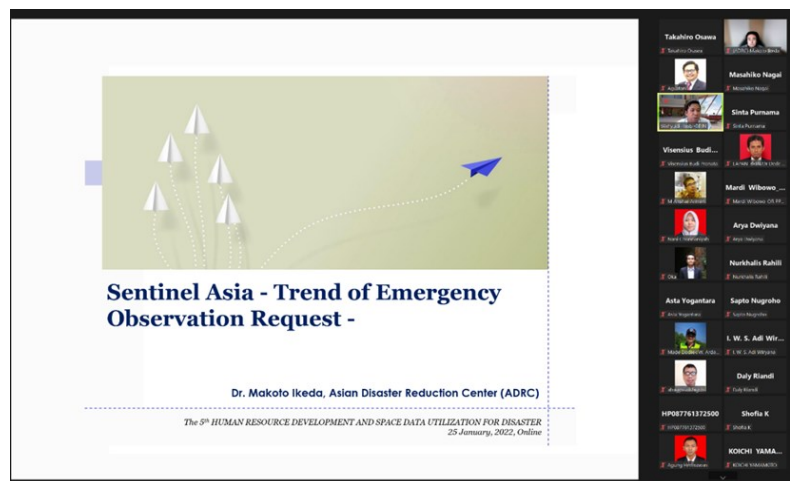


Figure 5.13 ADRC presentation in the symposium

#### 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 most of its activities in FY 2021.

- **18th Session of WMO's Regional Association V (Southwest Pacific), 1-3 Sep 2021**

As an observer to the constituent bodies of the World Meteorological Organization (WMO), ADRC participated in this session. The key discussions at the session pertained to the working structure, strategic priorities, and flagship initiatives of Regional Association V in the context of the WMO's Comprehensive Regional Reform. ADRC has been engaging in the activities of the regional association to further explore collaboration on new initiatives as well as to promote partnerships that could lead to closer regional cooperation.



Figure 5.14 Screenshot of the 18th Session of WMO RA-V

- **16th Working Group on DRR (WGDRR), 5 November 2021**

Thirty (30) representatives from ESCAP, WMO, ADRC, Thailand, Malaysia, Lao PDR, Vietnam, USA, China (Shanghai, Hong Kong, and Macau), and Typhoon Committee Secretariat (TCS) participated the virtual meeting held on 5 November 2021. The key outcome of the meeting was the proposed 2022 Annual Operations Plan (AOP). It should be noted that this outcome was later presented and discussed



Figure 5.15 Screenshot of the 16th WGDRR Meeting

further at the 16th Integrated Workshops (16th IWS) of the Typhoon Committee, 2-3 December 2021. Members of the WGDRR noted that the 2022 AOP is similar to the 2021 AOP, where only AOP6 incurred expenditure. In view of this, members agreed that all the 2021 projects will continue in 2022.

- **16th Integrated Workshop (IWS) of the Typhoon Committee, 2-3 December 2021**

The IWS is an annual event for members and observers of the Typhoon Committee (TC) to review the activities and progress of the four TC working groups: Working Group on Meteorology (WGM); Working Group on Hydrology (WGH); Working Group on Disaster Risk Reduction (WGDRR); and Training and Research Coordination Group (TRCG). During the two-day event, members of each working group

discussed, in parallel, its respective priorities in line with the Typhoon Committee's Draft Strategic Plan 2022-2026. ADRC is a member of the WGDRR, and participated in discussing priorities and key result areas (KRAs) of this group.

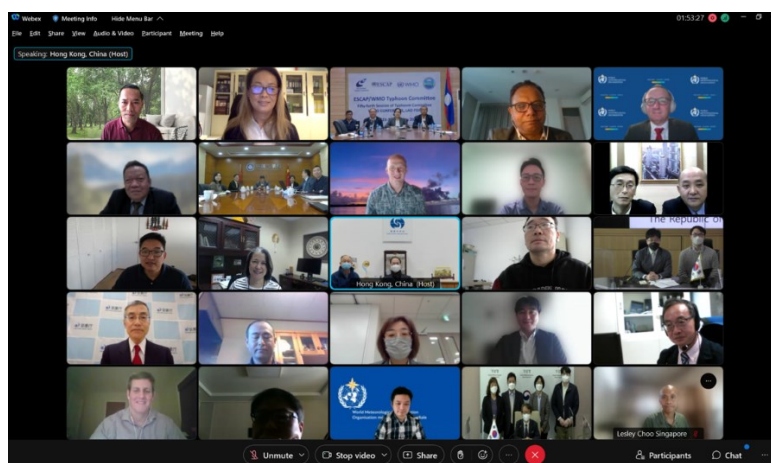


Figure 5.16 Screenshot of the 54th Session of the Typhoon Committee

- **54th Session of the Typhoon Committee, 23-25 February 2022**

Lao PDR hosted the 54th Session of the Typhoon Committee which was held online. The event opened by electing Madam Outhone Phetluangshy (Director General, Department of Meteorology and Hydrology, Ministry of Natural Resources and Environment) of Lao PDR and Mr Weng Kun Leong (Director Meteorological and Geophysical Bureau) of Macao, China as Chair and Vice Chair of the 54th Session respectively. One of the outcomes of the meeting was the presentation of the Committee's Strategic Framework 2022-2026 that is aimed at achieving two targets: 1) substantially reduce total mortality caused by tropical cyclone related disasters of the Members in the decade 2021-2030 compared to the period 2005-2015; and 2) Reduce direct economic loss caused by tropical cyclone related disasters in relation to the total GDP of the Members in the decade 2021-2030 compared to the period 2005-2015. The 55th Session of the Typhoon Committee will be organized in Macao, China in February 2023.

### 5.2.5 APP-DRR

ADRC engages in the Asia-Pacific Partnership for Disaster Risk Reduction (APP-DRR), which is a multi-stakeholder forum for disaster risk reduction focused on the implementation of the Sendai Framework. ADRC contributes in the APP-DRR, as it serves as the main consultation forum for the Asia-Pacific Ministerial Conference for DRR (APMCDRR) and implementation of the new Asia Pacific Action Plan of the Sendai Framework.

- **APP-DRR Forum, 8-9 December 2021**

The discussions in this Forum emphasized seizing new regional opportunities in order to make more progress through the new Asia Pacific Action Plan (2021-2024), the Global Platform for Disaster Risk Reduction, 23-28 May 2022 in Bali, Indonesia; the Asia-Pacific Ministerial Conference on Disaster Risk Reduction (APMCDRR), 19-22 September 2022 in Brisbane, Australia; and the Mid-Term Review of the Sendai Framework. At the Forum, ADRC Executive Director Mr NAKAGAWA Masaaki, proposed two points to advance an evidence-based approach for the mid-term review. One is to give more focus on data development in developing countries to address the lingering challenge of lack of disaster risk

reduction data. The other is to have greater actions and increase efforts in reducing disaster risk in addition to disaster response activities.

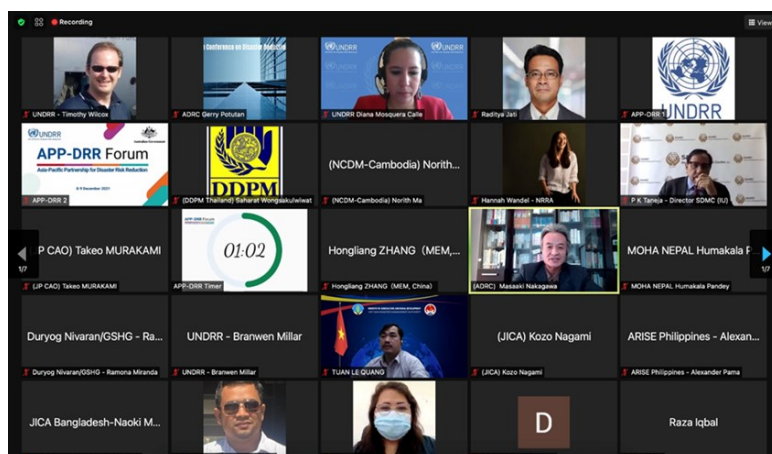


Figure 5.17 Screenshot of the APP-DRR Forum 2021

### 5.2.6 Other International Engagements

Upon invitation of international and regional organizations, ADRC participated in conferences and seminars in FY 2021 as opportunity to disseminate DRR information as well as strengthen the ADRC network.

- **Workshop on the Accessibility of Emergency Plans and Systems, 15 June 2021**

This workshop was organized by the Ministry of Family, Labour and Social Services in Turkey. It was an opportunity for DRR institutions and organizations from around the world to give updates on the latest DRR activities related to the accessibility of emergency and evacuation plans and systems ADRC presented in Session 3, "Examples of Good Practices for the Accessibility of Emergency and Evacuation Plans and Systems".



Figure 5.18 Flyer of the Workshop on Accessibility of Emergency Plans

- **Workshop on State Resilience to Shocks and Disasters, 13-14 August 2021**

This two-day event was held in Freetown, Sierra Leone and organized by the African Peer Review Mechanism (APRM) in collaboration with the United Nations Office for Disaster Risk Reduction (UNDRR), the World Health Organization (WHO), the European Commission (EC), African Risk Capacity

(AFC), and the Economic Community of West African States (ECOWAS). The discussions focused on five themes: (1) Disaster Risk Knowledge; (2) Understanding Disaster Risk Governance, (3) Building Resilience in Health, Agriculture, Peace, and Security in Africa; (4) Multi-Hazard Early Warning Systems and Emergency Operations; and (5) Developing Integrated Disaster Risk Financing. Dr Gerry Potutan of ADRC gave a presentation entitled, “Building the Case for Multi-Hazard DRM System Experiences in Asia during the COVID-19 Pandemic”.

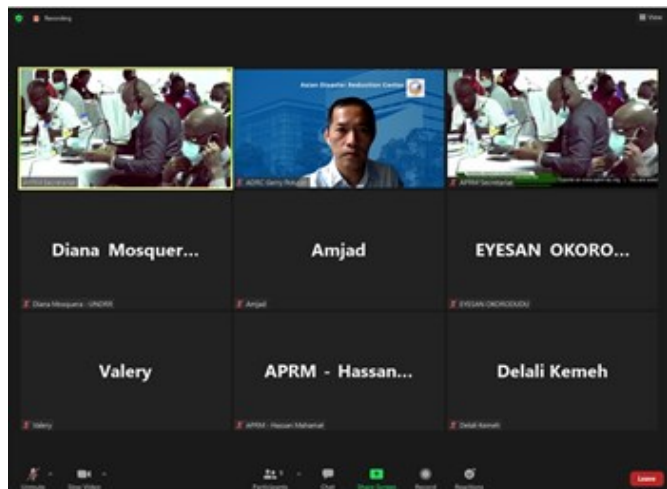


Figure 5.19 Screenshot of the workshop hosted by APRM

- **5th Global Summit of GADRI: Engaging Sciences in Action, 1 September 2022**

This summit was organized by the Global Alliance of Disaster Research Institutes (GADRI) managed by Kyoto University. ADRC participated in the Panel Discussion and presented the utilization of space technology for DRR and good practices involving Sentinel Asia. ADRC suggested the strengthening of networks between disaster management organizations and space agencies as well as expanding the networks of research institutions to support Sentinel Asia.

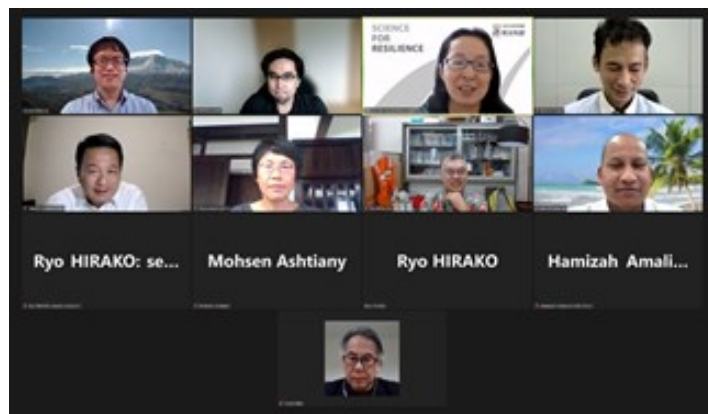


Figure 5.20 Screenshot of the 5th GADRI Global Summit

- **Inter-Regional Dialogue on Regional Cooperation - Application of Cutting-Edge Technology for Disaster Risk Reduction in China, Japan, and Korea, 13 October 2021**

This activity was organized by the Trilateral Cooperation Secretariat (TCS) and the UNDRR Office for Northeast Asia (UNDRR ONEA), where ADRC gave a presentation that included the following case studies: 1) new mapping technology known as “Red Relief Image Map (RRIM)”; 2) new communication technology called “Relay-by-Smartphone”; and 3) an environmentally-friendly disaster resilience technology known as “Gabion”.

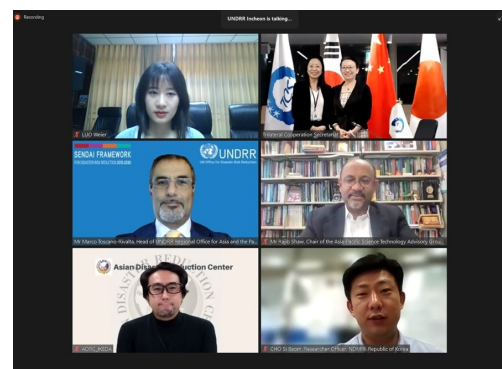


Figure 5.21 Screenshot of the Inter-Regional Dialogue

- **Workshop on DRR, School Safety, and Safe Reopening of Schools, 21-23 Dec 2021**

Upon invitation of the National Institute of Disaster Management (NIDM), ADRC delivered a keynote speech at the workshop. ADRC offered insights on adapting the school disaster risk reduction (School DRR) activities with the COVID-19 Pandemic during the re-opening to the officials in India who participated in the workshop. During the three-day event, the discussions took a detailed look at the impacts and implications of COVID-19 on school safety in India and what countermeasures can be taken for safe reopening of schools. As a consequence of the lockdowns, schools in India have been indefinitely closed. Outcomes of the workshop include crafting joint strategies among state governments and other stakeholders for education continuity planning after the COVID-19 pandemic.



Figure 5.22 Flyer of the Workshop on School Safety

- **4th Spatial Planning Platform Forum, 9 February 2022**

ADRC organized a session entitled "Resilient Society through Disaster Risk Reduction" at the 4th Spatial Planning Platform (SPP) Forum held online on 9 February. The SPP is an organization led by UN Habitat and the government of Japan, with the participation of Asian countries and specialized organizations, which aims to contribute to the creation of a sustainable society through better urban and regional planning. The 4th SPP Forum featured presentations from: 1)



Figure 5.23 Screenshot of the 4th SPP Forum

2) Prof NISHIKAWA of Nagoya University on planning efforts for disaster risk reduction (DRR) in Japan; 2) Sendai City on the integration of DRR into local government planning; and 3) Philippine Government on lessons learned from community relocation in the process of disaster recovery and reconstruction.

- **Forum on Climate Change and DRR, 13 February 2022**

Dr Gerry Potutan, Senior Researcher of ADRC, gave a lecture in this Forum. The lecture highlights the importance of investing in the community by enhancing practical capacities that can contribute to building disaster resilience. The purok system in the Municipality of San Francisco, Cebu Province, is one example of such investment. Each purok in this municipality had successfully implemented pre-emptive evacuation through the support of its community

leader. Based on this experience, the following insights were drawn about community organizing through the purok system: 1) it enhances practical capacities for disaster response and recovery; 2) it institutionalizes mutual-help in the community; and 3) it prepares the community how to evacuate from and respond to disasters.



Figure 5.24 Screenshot of ADRC presentation in the Forum on Climate Change

## **6. International Recovery Platform**

## 6. International Recovery Platform

As a pioneering member of the International Recovery Platform (**Annex 2**), ADRC supports its activities, including co-hosting the IRP Secretariat in Kobe, Japan. IRP activities in FY 2021 are listed below.

### 6.1 International Recovery Forum 2022

Annually, in January, IRP organizes the International Recovery Forum (Forum) to exchange experiences and facilitate discussion on challenges to resilient recovery, and opportunities for building back better. The Forum was held in a hybrid modality on 19 January 2022, on the theme, “Redesigning Systems for Resilience through Recovery: Assessing Progress and the Unfinished Agenda at the Midpoint of the Sendai Framework”. Attended by 400 participants from 65 countries, the Forum featured keynote presentations and panel discussions.

As the Sendai Framework for Disaster Risk Reduction 2015-2030 approaches its mid-term implementation, the United Nations General Assembly has mandated that a midterm review of its implementation should be conducted, with specific reference made to assessing progress toward its core provision to “build back better”. The global pandemic, climate change, and setbacks to the Sustainable Development Goals underscore the necessity of assessing progress and challenges in building back better to date, and to collectively consider adjustments and actions necessary to implement Priority 4 moving forward.

The International Recovery Forum 2022 provided reflections on the implementation of Priority 4 and the challenges that remain, while setting a forward-looking agenda for continued progress. It featured retrospective and prospective discussions between recovery policymakers and experts on focused themes in recovery for enhanced implementation of building back better so that communities can recover faster, more equitably and with greater resilience from disasters. The Forum have two panel discussions that aim to achieve these objectives:

- The first objective is assessing the Six Years of Progress and Challenges in “Build Back Better” for Implementing the Sendai Framework. Panelists discussed progress, achievements, enablers and barriers in building back better and how these have informed improvements in recovery policies, governance, programmes, and outcomes.
- The second objective is to redesigning systems for resilience through recovery: Setting the Agenda for Advancing “Build Back Better” through 2030. Panelists discussed priorities and options to advance the implementation of building back better in the context of multiple hazards and systemic risk. It identified good practices that lead to transformative and resilience actions in recovery.

Speakers at the opening session included Mr Ronald JACKSON, Chair of the IRP Steering Committee (UNDP), Mr SAITO Motohiko, Governor of Hyogo Prefecture, Mr UCHIDA Yoshinari, Deputy Director General for Disaster Management, Cabinet Office, Government of Japan, and Ms Mami Mizutori, Special Representative of the United Nations Secretary-General (SRSG) for Disaster Risk Reduction, and Head of the United Nations Office for Disaster Risk Reduction (UNDRR).

The first keynote speaker was Mr TAKEYA Kimio, Distinguished Technical Advisor on Disaster Risk Reduction, Japan International Cooperation Agency (JICA). The second keynote speaker was Ms Cynthia

SPISHAK, Associate Administrator, Office of Policy and Programme Analysis Federal Emergency Management Agency (FEMA).

Members of the first panel discussions were Ms Elizabeth RILEY, Executive Director, the Caribbean Disaster Emergency Management Agency (CDEMA); Mr Anil POKHREL, Chief Executive, National Disaster Risk Reduction and Management Authority, Government of Nepal; Ms Litea BIUKOTO, Team Leader, Risk Reduction, The Pacific Community (SPC); and Mr Nathan NKOMO, Acting Chief Director, Department of Civil Protection, Ministry of Local Government, Public Works and National Housing, Government of Zimbabwe. Ms Cristelle PRATT, Assistant Secretary-General, Environment and Climate Action, Organization of African, Caribbean and Pacific States (OACPS) moderated this panel.

Members of the second panel discussions were Mr Ramesh SUBRAMANIAM, Director General, Southeast Asia Department, Asian Development Bank (ADB); Mr Jerry FANO, Head, Project Impact Analysis and Evaluation, Department of Public Works and Highways, Government of the Philippines; Ms Sithembiso GINA, Senior Programme Officer, Disaster Risk Reduction Unit, Southern African Development Community (SADC); and Mr José OLIVEIRA, National Director, National Directorate for Risk Prevention and Management, Government of Portugal. Ms Paola ALBRITO, Chief of Branch, Intergovernmental processes, Interagency Co-operation and Partnerships, United Nations Office for Disaster Risk Reduction (UNDRR) moderated this panel.

Finally, the Speakers at the closing session were Ms Paola ALBRITO, Chief of Branch, Intergovernmental processes, Interagency Co-operation and Partnerships, United Nations Office for Disaster Risk Reduction (UNDRR) and Mr MURAKAMI Takeo, Director, Cabinet Office, Government of Japan, on behalf of Co-Chair of the IRP Steering Committee.

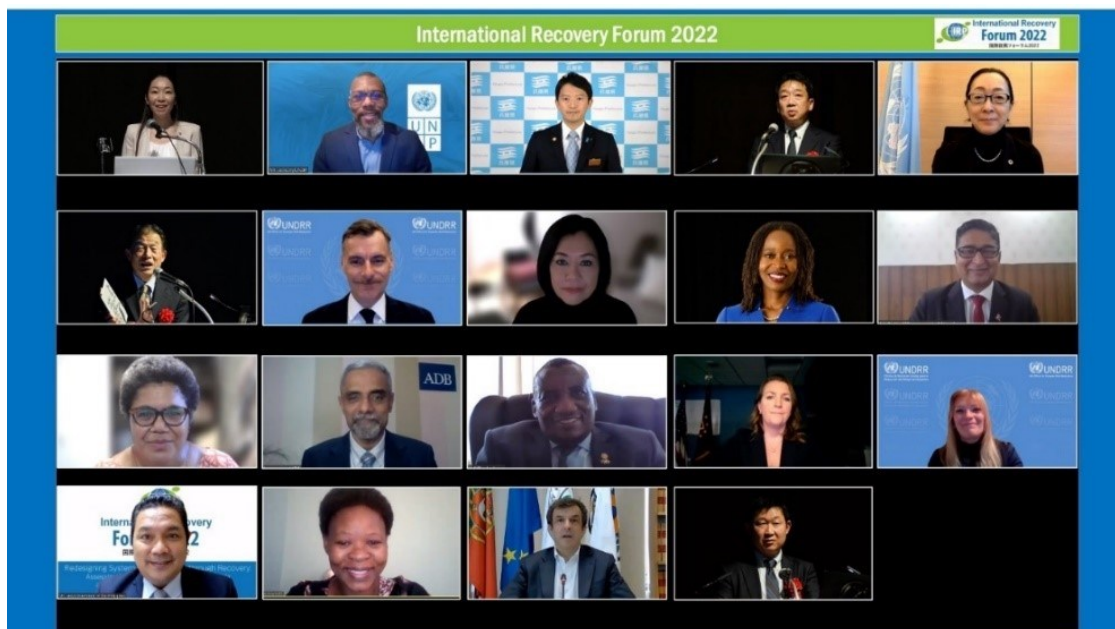


Figure 6.1 Speakers of the International Recovery Forum 2022

## 6.2 6th National Convention for the Promotion of Disaster Reduction

On 5-6 November 2021, IRP participated in the 6th National Convention for the Promotion of Disaster Reduction (Bosai Kokutai 2021) which was organized by the National Convention for the Promotion of Disaster Reduction 2021 Steering Committee led by the Cabinet Office. This event has been held since FY2016 and is now in its sixth year. The purpose of this event is to raise awareness of disaster prevention among the people and to share knowledge and experiences about



Figure 6.2 Online display of IRP Guidance Notes on Recovery

disasters in order to enhance disaster preparedness, and to serve as an opportunity to raise awareness of disaster prevention at the individual and community levels. This year, the event was held hybrid (on site and online) in order to prevent COVID-19 infection.

Through the online exhibition, IRP introduced its activities to the international community to promote "Build Back Better" through the introduction of sectoral recovery guidance notes, leaflets outlining its activities, the IRP Herald and knowledge products related to COVID-19, and side events at the Global Platform for Disaster Reduction meeting and the Asian Ministerial Conference on Disaster Reduction.

## 6.3 Sendai Disaster Reduction and Future Forum 2022

On 5 March 2022, IRP participated in the Sendai Disaster Reduction and Future Forum 2022 held in Sendai City. The forum was held under the theme of "Linking Our Disaster Prevention and Environment to the Future of the Miyako of Mori" as an event where citizens could learn about disaster prevention and disseminate their daily activities through sessions, booths, and hands-on events in order to connect the experiences and lessons learned from the Great East Japan Earthquake to future disaster prevention. IRP set up its own exhibition booth and distributed leaflets outlining its activities, and the IRP Herald.



Figure 6.3 IRP Display Booth at the Sendai Forum 2022

## 6.4 Sessions at the Global DRR

In FY 2021, IRP was engaged with three Regional Platforms held by UNDRR, namely: 1) the European Forum for Disaster Risk Reduction, 2) the Fifth Arab Regional Platform for Disaster Risk Reduction, and 3) the VII Regional Platform for Disaster Risk Reduction in the Americas and the Caribbean.

IRP Secretariat organized a featured event “Building Back Better and Greener for Resilient Recovery from the Pandemic” with IRP SC member UNDP at the European Forum for Disaster Risk Reduction (EFDRR) on 24 November 2021. This event featured distinguished speakers from UNDP, the Cyprus Institute, UNDP Azerbaijan, and the Government of Ukraine. Speakers deliberated on the application of recovery needs assessment tools for greening recovery, decision support models for recovery planning and greening recovery, and the lessons that can be gleaned from recent experiences with planning and investing in resilience in the pandemic recovery. According to the organizer of the EFDRR, the event was among the most well-attended side events at the conference, with 269 live participants, and more than 100 on-demand views.

In the 5th Arab Regional Platform for Disaster Risk Reduction: “Build Back Better Post Disaster Recovery an Opportunity to Build Resilience in the Arab Region”, on 10 November 2021 – IRP SC Co-Chair Cabinet Office of Japan and IRP Secretariat co-presented.

In the 7<sup>th</sup> Regional Platform for Disaster Risk Reduction in the Americas and the Caribbean: IRP SC members UNDP and GFDRR co-organized “Risk-Informed Recovery in a Multi-hazard Context: Lessons Learned from Current Times” on 2 November 2021. This event was an IRP co-branded side event, with IRP supported promotion, and implementation.

## 6.5 Upgrading of IRP Website

The IRP Secretariat worked intensively with the UNDRR Communications, Advocacy, Knowledge Management and IT team throughout 2021 to design and build a new IRP website. The IRP Secretariat completed the design and development of the renewed site, and pre-launched the renewed site on 19 January 2022 during the International Recovery Forum 2022. The previous IRP website was maintained until 16 February 2022 at which point it was

archived. The IRP Secretariat migrated more than 2,000 recovery-related publications and events to the new site, and has since uploaded more than 200 publications in 2021 to be disseminated through the new site and the PreventionWeb. The existing website continued its growth in web traffic, with more than 51,000 unique visitors to the site in 2021, up from 37,000 in 2020, and 32,000 in 2019.

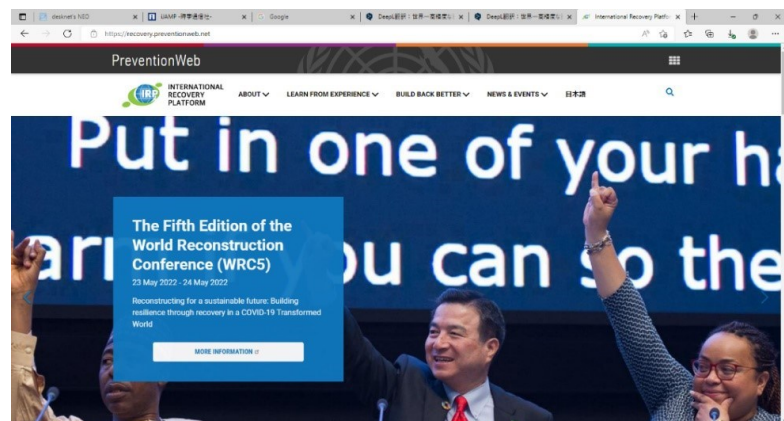


Figure 6.4 Screenshot of upgraded IRP website

## **7. Natural Disaster Databook 2021**

## 7. Natural Disaster Databook 2021

ADRC publishes the *Natural Disaster Databook* annually to provide statistical and analytical perspectives of natural disaster data. ADRC retrieves data from the Emergency Event Database (EM-DAT) in order to better understand the occurrence, deaths, people affected, and economic losses from disaster events (See Annex 3: Notes on the Sources of Data). The analytical overview, presented in graphs with explanations, is divided into three key sections:

- In Section 7.1, natural disaster data of 2021 is compared with the annual average data of 1991-2020 both at the Global level and at the regional level (Asia)
- In Section 7.2, climate-related disaster data of 2021 is compared with the annual average data of 1991-2020 both at the Global level and at the regional level (Asia)
- In Section 7.3, COVID-19 situations at the global level and in the ADRC member countries are presented to show the cumulative data of confirmed cases and deaths

Based on the data from EM-DAT, the number of disaster occurrences has significantly increased during the last 30 years (1991-2020). This increasing trend is observed globally and in the Asian region. In 2021, the total of disaster occurrences was 436, which is higher than the annual average of 376 during the last 30 years. Flood and storm have consistently shown the highest frequency of occurrence and subsequently with the highest amounts of economic losses. Although the frequency of disaster occurrences has been increasing, the number of deaths from disasters is decreasing. Existing data shows that deaths from disasters in 2021 is 14,442. This is lesser compared to the annual average of 61,086 during the past 30 years (1991-2020). Two implications can be highlighted about this data. On one hand, it could indicate that the disaster risk management (DRM) systems have improved. On the other hand, it could imply that lower deaths in 2021 is simply due to the absence of mass casualty events similar to the India Ocean Tsunami (2004) or the Great East Japan Earthquake (2011). In 2021, economic losses from disasters continued to show an increasing trend, and this is hugely concentrated in high-income or developed countries, such as the United States or Japan. Asian remains to be the most disaster-prone region in the world such that in 2021, the region recorded the highest number of disaster occurrences, particularly in Indonesia (28), Indian (19), China (17), and the Philippines (14).

Regarding climate-related disasters, the data shows an increasing trend during the last 30 years, and its impacts are becoming more destructive. In 2021 alone, extreme cold waves (e.g., France in April) and heat waves (e.g., Canada in July) were recorded in many parts of the world. Climate-related disasters, particularly flood, storm, and drought, account for the highest number of people affected as well as economic losses in 2021 – a continuing trend since the last 30 years. With regard to climate-related disasters in Asia in 2021, aside from heat wave, India was severely impacted by floods and cyclones affecting more than 18 million people. Bangladesh and Nepal were hit by floods that impacted millions of people. Floods affected 14 million people in China and over 1 million people in Indonesia. Furthermore, drought has been affecting millions of people during the past 30 years, and it incurred economic losses affecting more than 28 million people in Asia in 2021 alone.

Regarding COVID-19 situation, the data shows declining trends both in the number of cases and the number of deaths globally. The peak was in January 2022 when 23,201,079 cases were recorded during the winter

at northern hemisphere. COVID-19 cases and deaths in ADRC member countries also showed a declining trend. Factors contributing to the decline could be attributed to increasing rate of vaccination, weaker strain of the virus, and improvement in the medical system for handling COVID-19 cases.

## 7.1 Natural Disaster Data

Using the data from EM-DAT/CRED, UC Louvain, Brussels, Belgium ([www.emdat.be](http://www.emdat.be)) retrieved on 7 July 2022, this section presents the trends in natural disasters both at the global and at the regional (Asia) levels. At each level, disaster impacts are analyzed in terms of occurrence, death tolls, people affected, and economic losses.

### 7.1.1 Global Disaster Data

Globally, there has been an increasing trend of disaster occurrence since 1900 (Figure 7.1). Compared with the frequency of disaster occurrence in the 1960s with the present trend, the frequency of disaster occurrence increases as much as tenfold. Some of the key determinants for this increasing trend are population growth and economic development (See Annex 4: Key Determinants).

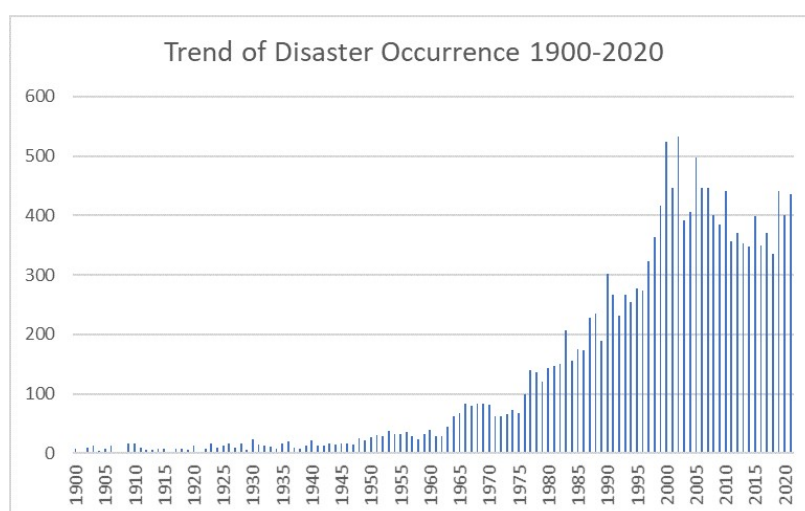


Figure 7.1 Trend of disaster occurrence 1900-2020  
(EM-DAT/CRED, 2022)

In 2021, the Asian region exhibited the highest number of disaster occurrences at 40% of the total global occurrences. This figure indicates that Asia remains to be the most disaster-prone region in the world considering that in the last 30 years (1991-2020), the region accounted for 39% of the total disaster occurrences (Figure 7.2).

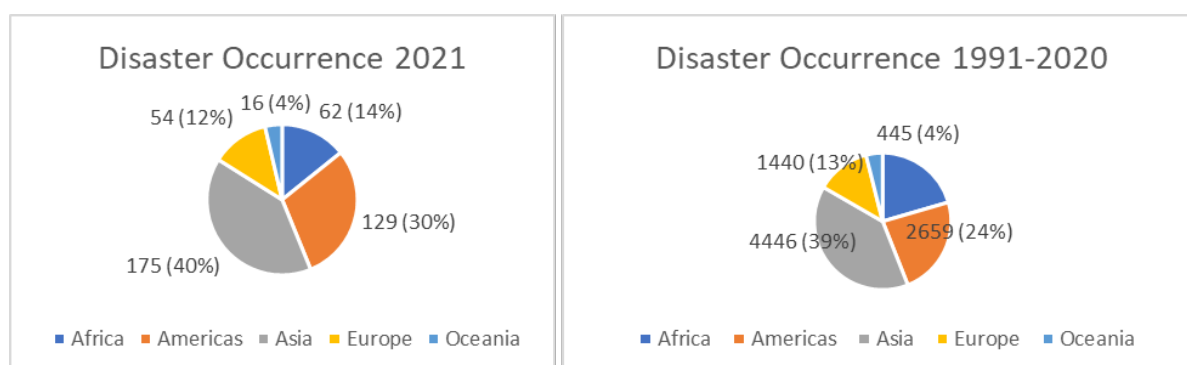


Figure 7.2 Disaster occurrence data by region 2021 vs 1991-2020  
(EM-DAT/CRED, 2022)

### • Occurrence

Around the world, EM-DAT recorded a total of 436 natural disaster occurrences in 2021. This number is higher compared with the annual average of 376 disaster occurrence during the last 30 years (Figure 7.3). In particular, flood and storm have consistently shown the highest frequency of occurrence in 2021 and during the last 30 years. Among the most devastating flood and storm events in 2021 were: 1) floods in Maharashtra State, western India, from June to September 2021; 2) heavy flooding in Henan Province, China from 16-20 July 2021; 3) massive flash floods, triggered by heavy rain, in Kamdesh District, Nuristan Province, Afghanistan in July 2021; and 4) Typhoon Rai (local name: Odette) in southeastern part of the Philippines on 16 December 2021.

#### DISASTER OCCURRENCE (GLOBAL)

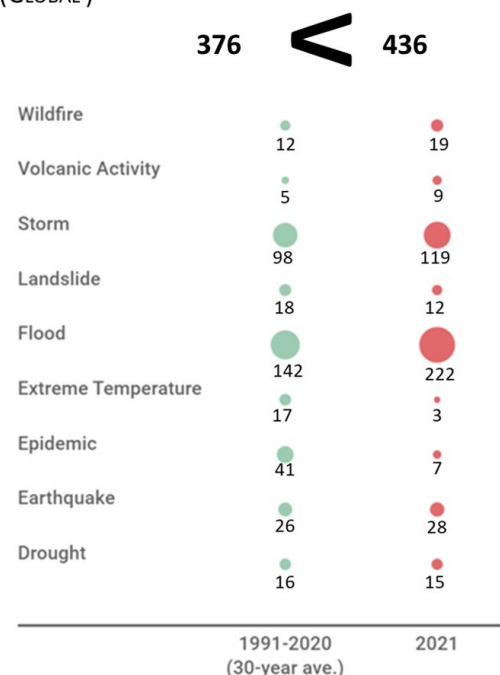


Figure 7.3 Global disaster occurrence 2021 vs 1991-2020 (EM-DAT/CRED, 2022)

### • Deaths

As shown in Figure 7.4, the total number of people who died from disasters in 2021 is 14,442. This number is lesser compared to the annual average of 61,086 people who died from disasters during the past 30 years (1991-2020). Two implications can be highlighted about this data. On one hand, since the number of deaths from disasters is getting lesser (despite the fact that the number of disaster events is increasing) could indicate that the disaster risk management (DRM) systems may have improved. On the other hand, it could mean that the number of deaths in 2021 is lesser simply because there were no mass casualty events similar to the Hanshin-Awaji Earthquake (1995), the Indian Ocean Tsunami (2004), and the Great East Japan Earthquake (2011) that occurred during the previous 30 years. However, it should be noted that deaths by wildfire and volcanic eruption are not decreasing as other hazards, indicating that the challenges of reducing the number of deaths is still there.

#### DEATHS BY DISASTER TYPE (GLOBAL)

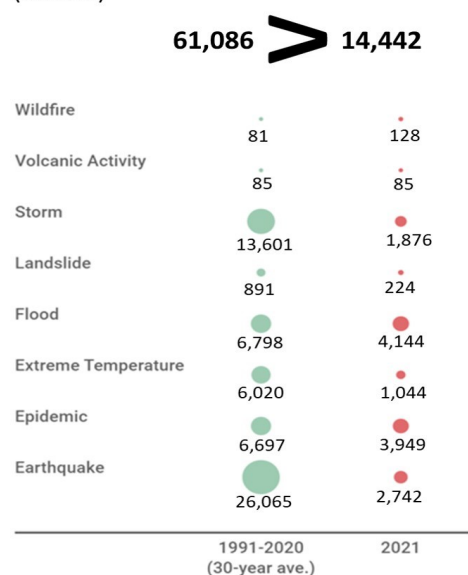


Figure 7.4 Global number of deaths by disaster type (EM-DAT/CRED, 2022)

### • People Affected

Overall, the number of people affected by disasters in 2021 is lesser compared to the annual average of the last 30 years (Figure 7.5). It is likely due to the fact that there were more large-scale disasters that occurred during the last 30 years than in 2021. The trend shows that annually, more and more people are affected by flood, drought, and storm. Usually, the locations of people who are highly vulnerable to these climate-related hazards are hugely concentrated in low and middle-income countries – that often have limited capacities for disaster risk reduction (DRR). In particular, drought (which is a slow onset disaster) has been affecting about 57 million people annually since the last 30 years, and still continually affecting low-income countries in 2021.

### PEOPLE AFFECTED BY DISASTER TYPE (IN MILLION) (GLOBAL)

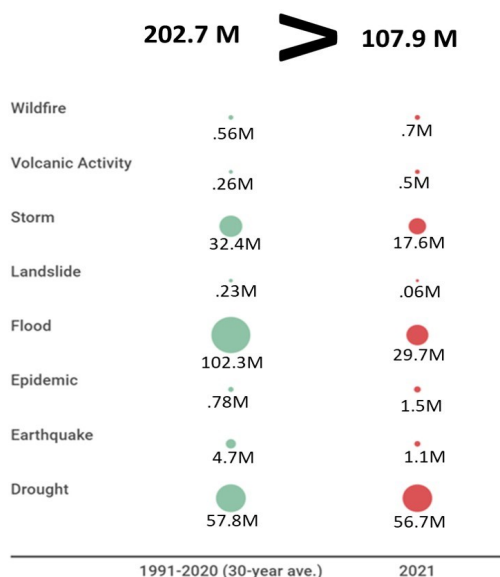


Figure 7.5 Global number of people affected by disaster type (EM-DAT/CRED, 2022)

### • Economic Losses

Economic losses from disasters in 2021 are higher compared to the annual average of economic losses in the last 30 years (Figure 7.6). EM-DAT data indicates that the huge economic losses from disasters are concentrated in high-income or developed countries (e.g., Japan and United States) due to massive destructions in infrastructures and properties, which subsequently result in business interruption losses.

### ECONOMIC LOSSES BY DISASTER TYPE (IN BILLION US\$) (GLOBAL)

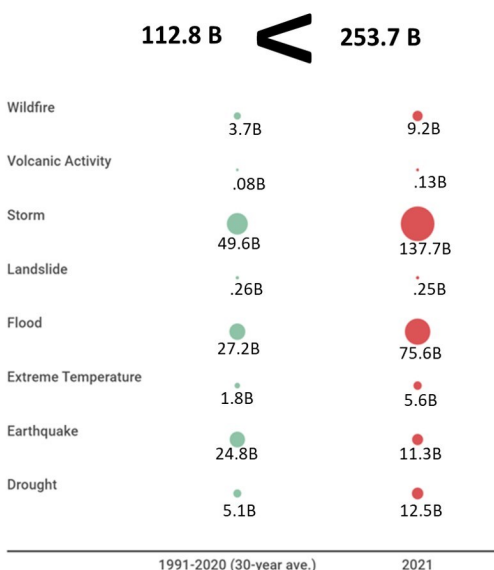


Figure 7.6 Global economic losses (EM-DAT/CRED, 2022)

### 7.1.2 Asian Disaster Data

Recognizing that Asia is the most disaster-prone region in the world, ADRC specifically highlights disaster data from this region. In 2021, the top 10 countries in Asia with the highest number of disaster occurrences, include: Indonesia (28), India (19), China (17), and the Philippines (14) among others (Figure 7.7).

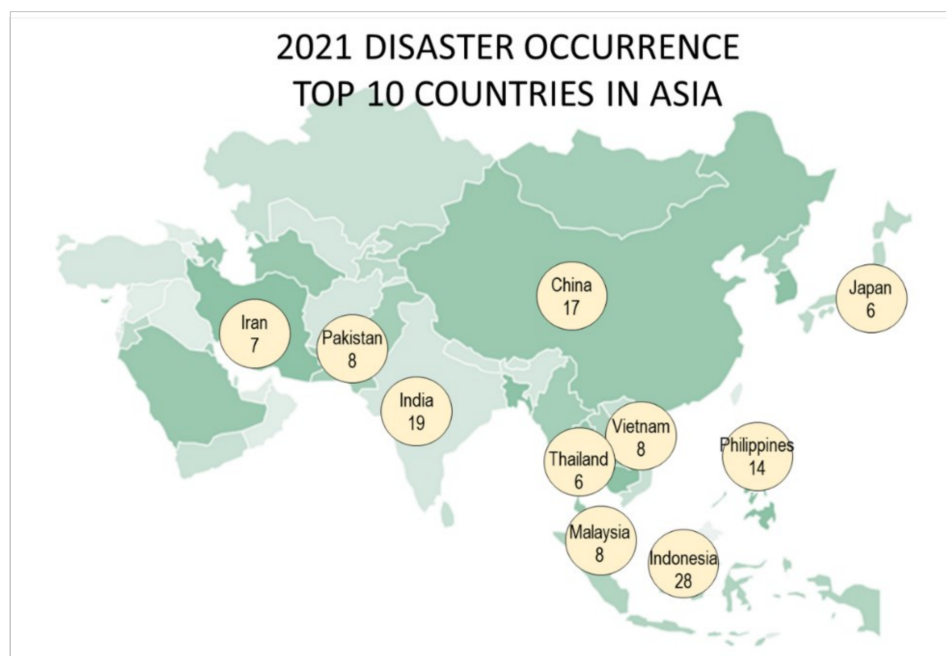


Figure 7.7 Top ten countries in Asia with high disaster occurrence in 2021  
(EM-DAT/CRED, 2022)

#### • Occurrence

Disaster occurrence in Asia in 2021 is recorded at 175. This number is higher compared with the annual average of disaster occurrences during the last 30 years (Figure 7.8). Disaster types that have increasing frequency of occurrences are flood, storm, and earthquake. In 2021 alone, seven earthquakes with magnitude 7 or above had occurred in Asia, including the earthquake that hit Davao Oriental in the Philippines on 12 August 2021 of magnitude 7.1.

#### DISASTER OCCURRENCE (ASIA)

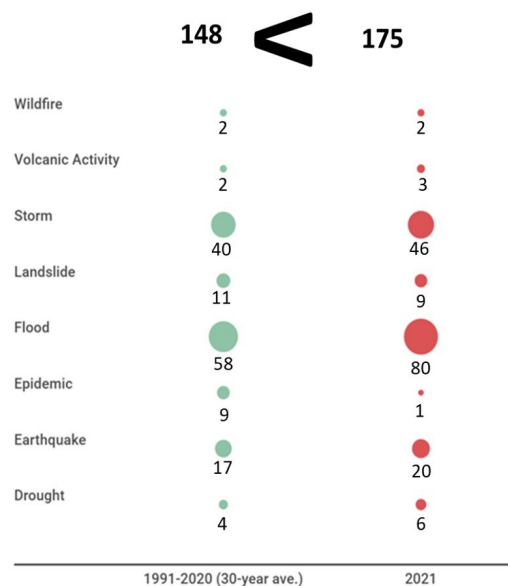


Figure 7.8 Disaster occurrence in Asia  
(EM-DAT/CRED, 2022)

### • Deaths

In terms of the number of people killed by disasters, data in Asia showed that lesser people died from disaster in 2021 compared to the annual average of the last 30 years (Figure 7.9). This is consistent with the global trend showing that while the number of disaster occurrences is increasing, the number of people killed from those disasters is decreasing. This implies that countries in Asia may have relatively improved their disaster risk management systems. With regard to the disaster type that caused more deaths, the data shows that flood, storm, and earthquake caused massive casualties.

#### DEATHS BY DISASTER TYPE (ASIA)

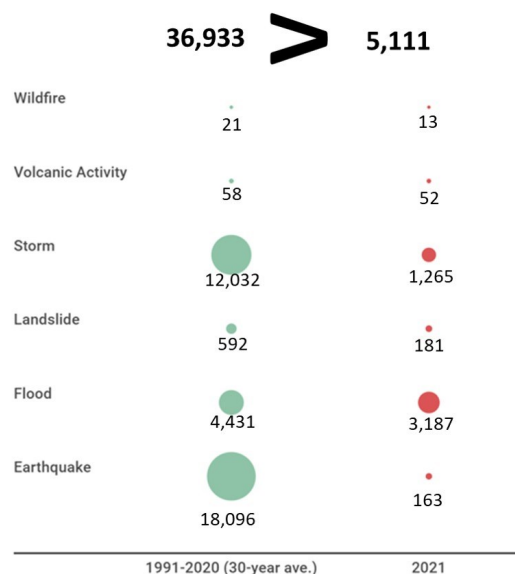


Figure 7.9 People killed by disaster type in Asia  
(EM-DAT/CRED, 2022)

### • People Affected

Compared with the annual average number of people affected by disasters in the last 30 years (1991-2020), the number of people affected by disasters in Asia in 2021 is lesser (Figure 7.10). Disaster types that hugely affect people in Asia are flood, drought, and storm. In particular, drought has been consistently affecting high number of people in Asia during the last 30 years as well as in 2021.

#### PEOPLE AFFECTED BY DISASTER TYPE (IN MILLION) (ASIA)

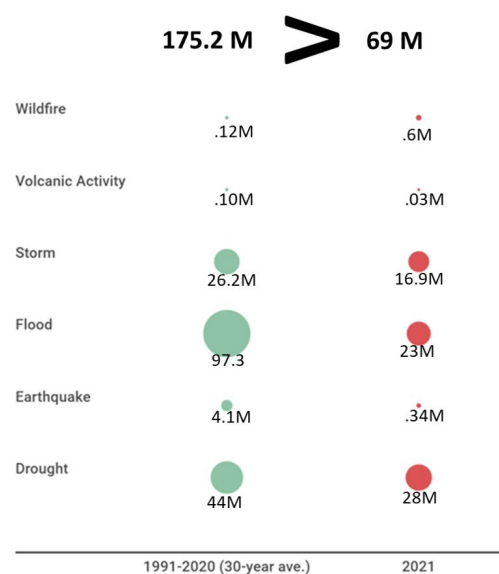


Figure 7.10 People affected by disaster in Asia  
(EM-DAT/CRED, 2022)

## • Economic Losses

Economic losses from disasters are lesser in 2021 compared with the annual average of economic losses in the last 30 years (Figure 7.11). The disaster types that incurred enormous economic damage in Asia are flood, earthquake, and storm. This data implies that flood has been consistently causing massive economic impact followed by storm and earthquake.

ECONOMIC LOSSES BY DISASTER TYPE (IN BILLION US\$)  
(ASIA)

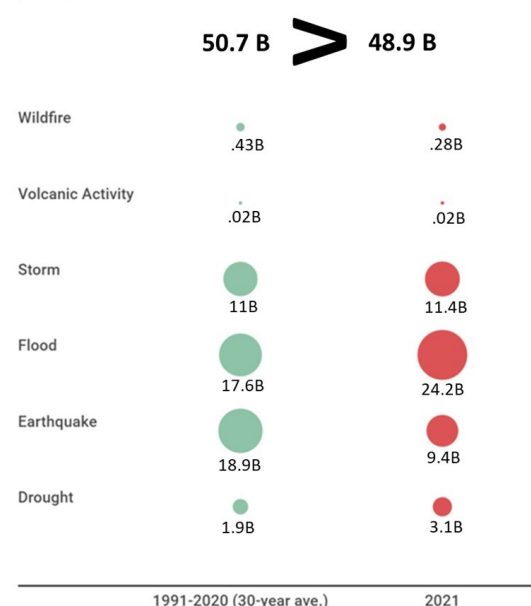


Figure 7.11 Economic losses from disasters in Asia  
(EM-DAT/CRED, 2022)

## 7.2 Climate Related Disasters

In this section, an overview of climate-related disasters (particularly those triggered by drought, extreme temperature, storm, flood, and wildfire events) will be highlighted. As a background, many factors contributing to climate change may be gleaned from the historical perspective since the industrial revolution (which led to economic growth, booming industries, and heightened development). Industrial revolution has environmental costs (e.g., 'The Anthropocene') that resulted in the earth's geological state, impacting the atmosphere and altered the hazard profiles that make it more frequent and severe. These environmental costs also contributed to the sudden and slow-onset hazards. Using the EM-DAT data, trends and impacts of climate-related disasters are analysed both at the global level and at the regional level (Asia).

### 7.2.1 Global trend in climate-related disasters

Data shows that there has been an increasing trend in climate-related disasters worldwide (Figure 7.12). On top of that, climate-related disasters are becoming more destructive. In 2021 alone, extreme cold waves and heat waves were recorded in many parts of the world. In April 2021, France was hit by extreme cold wave, and in June-July 2021, many parts of North America were hit by heat waves. British Columbia, Canada topped a stunning 49.6°C (121°F) on 29 June 2021. On the same day, Quillayute, Washington in the United States recorded an astonishing heat wave of 43.3°C (110°F).

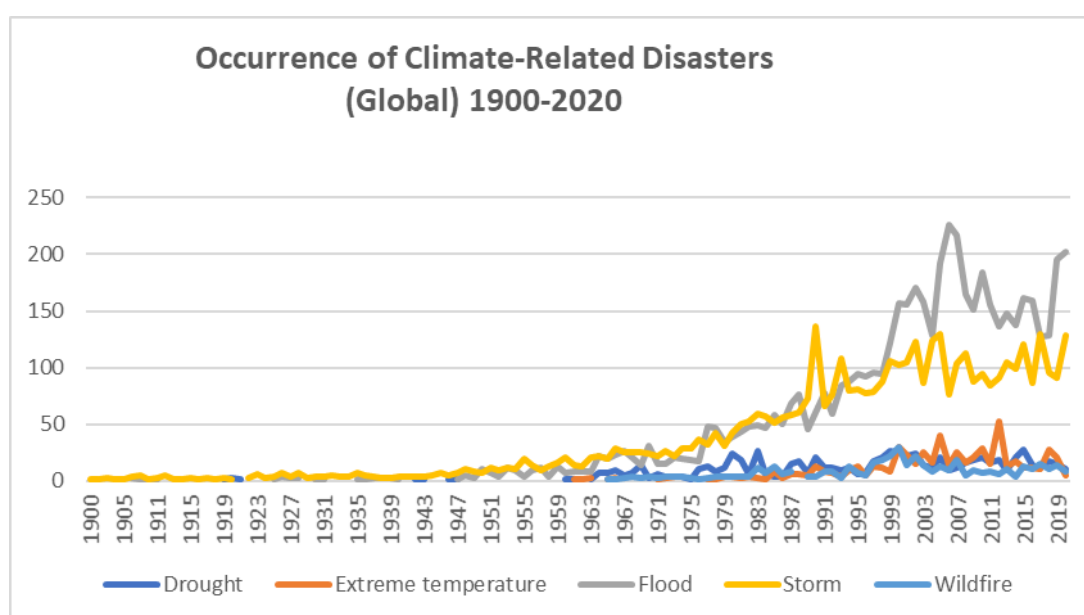


Figure 7.12 Global Occurrence of Climate-related disaster  
(EM-DAT/CRED, 2022)

Globally, climate-related disasters (particularly: flood, storm, and drought) account for the highest number of people affected as well as economic losses in 2021, a trend that continues since the last 30 years (Figure 7.13).

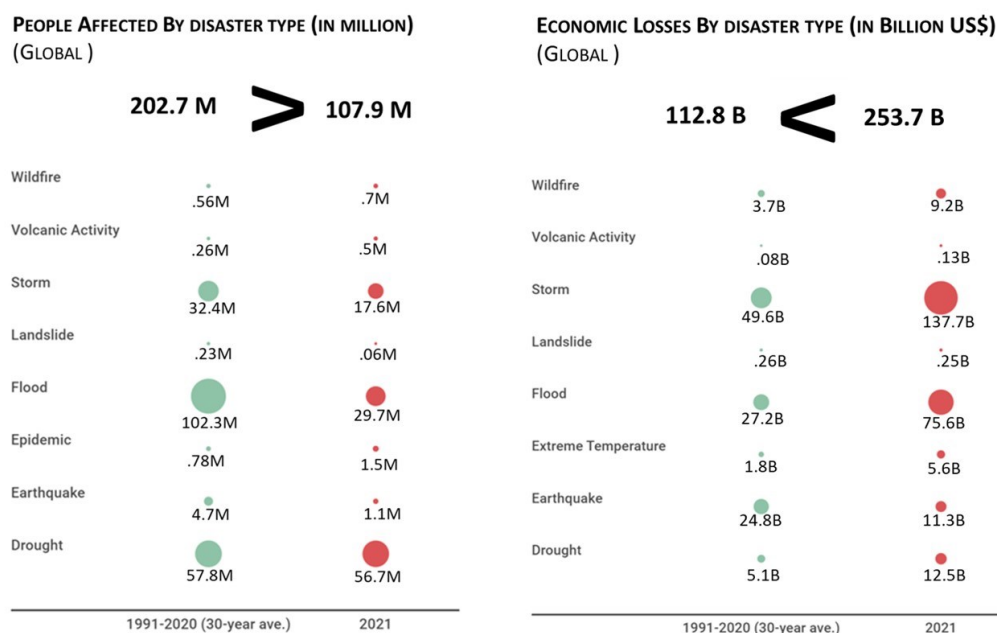


Figure 7.13 Impacts of climate-related disasters  
(EM-DAT/CRED, 2022)

## 7.2.2 Asian trend in climate-related disasters

In Asia, the trend of climate-related disasters mirrors the global trend with increasing occurrence of flood and storm (Figure 7.14). So, similarly in 2021, most Asian countries experienced an increasing trend of climate-related disasters. Aside from the heat wave, India was severely impacted by floods and cyclones affecting

more than 18 million people. In Bangladesh and Nepal, millions of people were impacted by floods. In July 2021, about 14 million people in Henan Province, China and about 1 million people in Indonesia were impacted by floods.

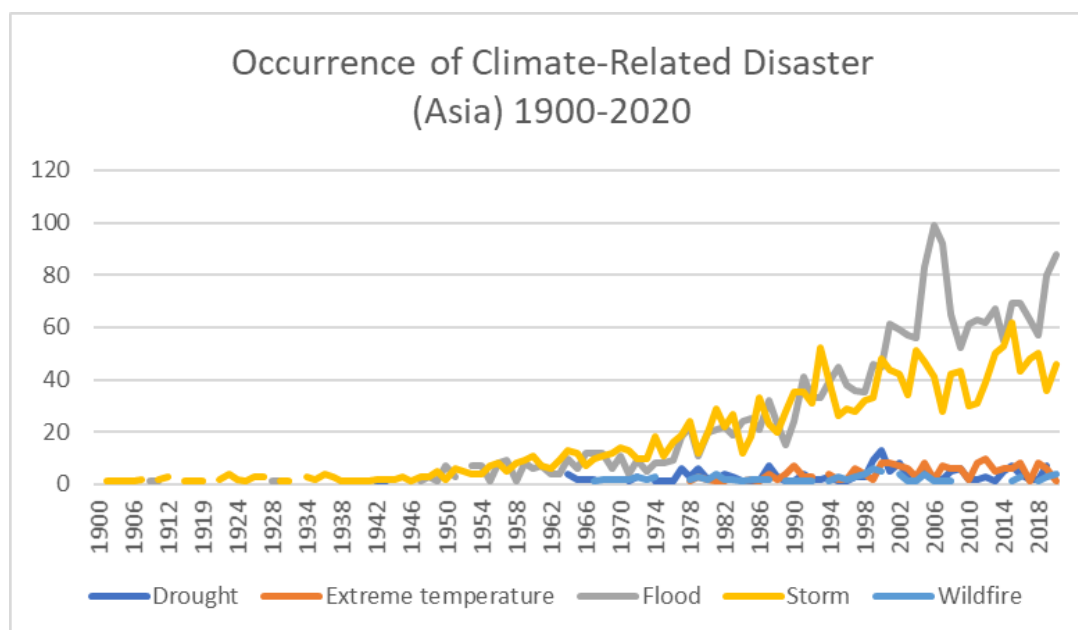


Figure 7.14 Occurrence of climate-related disasters in Asia  
(EM-DAT/CRED, 2022)

Drought has also been affecting millions of people during the past 30 years and in 2021 (Figure 7.15). Additionally, in 2021, drought incurred economic losses that unfolded slowly, but with devastating consequences affecting more than 28 million people.

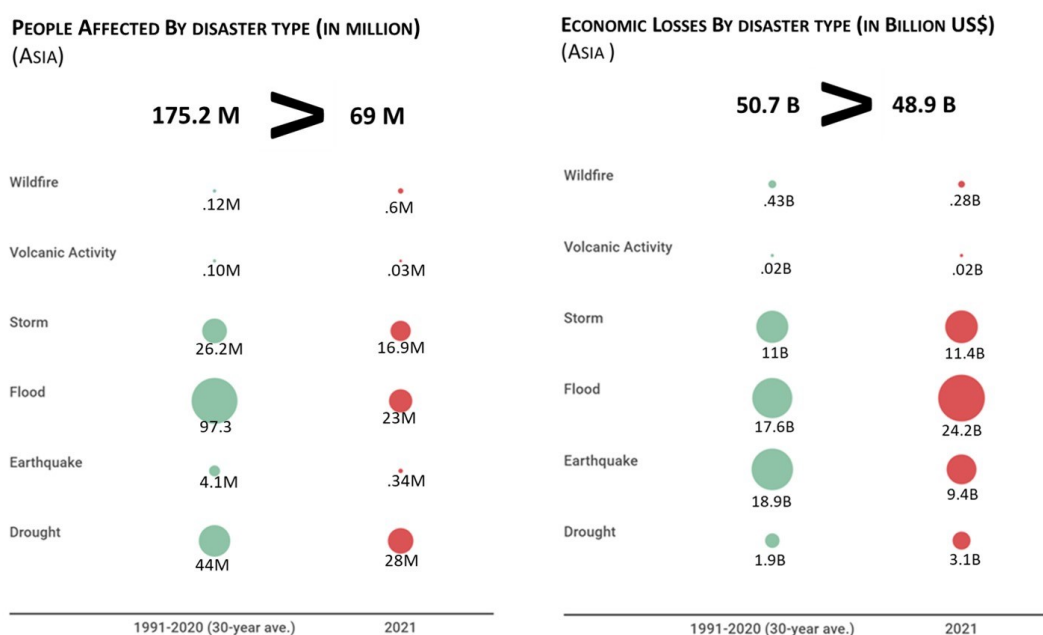


Figure 7.15 People affected and economic losses from disasters in Asia  
(EM-DAT/CRED, 2022)

### 7.3 COVID-19 Data

After two years of the COVID-19 pandemic, the virus continues to mutate and spread around the globe with no foreseeable end in sight. In this regard, this section presents an overview of the cumulative data of confirmed cases and deaths since 11 March 2020 when the World Health Organisation (WHO) declared the pandemic. Using the data retrieved from the *World Health Organisation COVID-19 Dashboard*, an overview of the COVID-19 situations at the global level and in ADRC member countries will be presented.

#### 7.3.1 Global Situation

Since the beginning of the pandemic, there have been multiple virus cycles that led to an upward trend of confirmed cases. As the virus developed, it became more potent and less dangerous, thus showing more cases and lesser number of deaths. In addition, more individuals were vaccinated, thus reducing the worst impacts of the virus. The peak was in January 2022 when 23,201,079 cases were recorded in the winter at northern hemisphere.

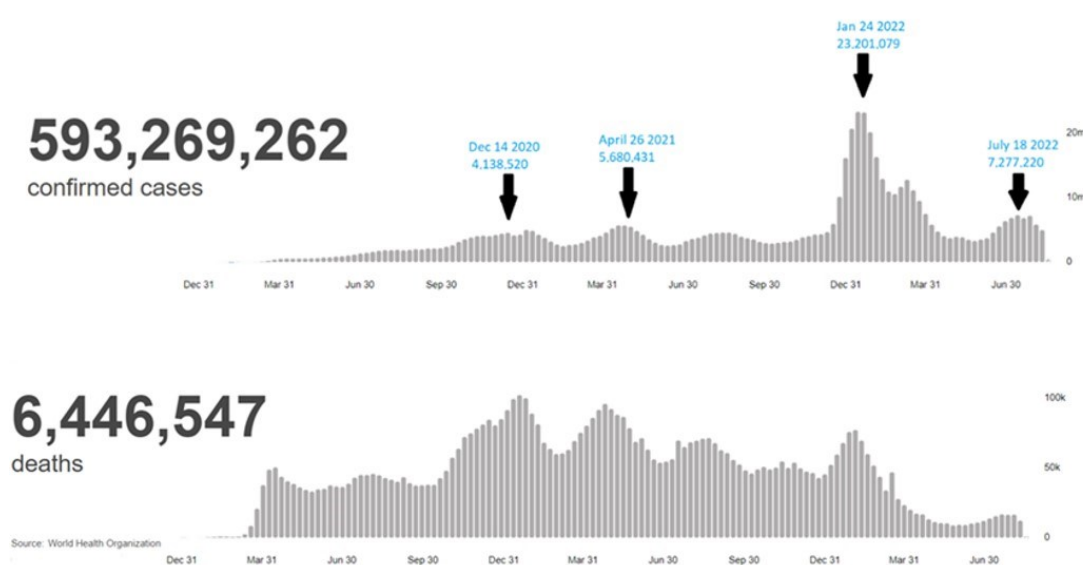


Figure 7.16 Global situation of COVID-19 as of July 2022  
(WHO, 2022)

#### 7.3.2 COVID-19 Situation in ADRC Member Countries

Among the ADRC member countries, India has recorded an extremely high number of accumulated infected cases giving the impression that other member countries have lesser cases (Figure 7.17)

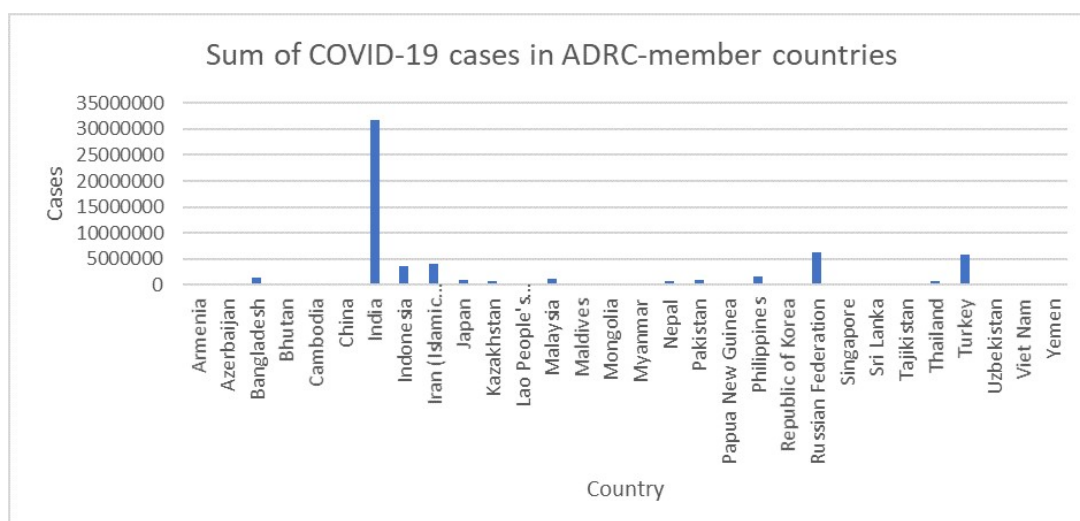


Figure 7.17 COVID-19 cases in ADRC member countries  
(WHO, 2022)

However, if India is taken out from the graph, a number of ADRC member countries have relatively high accumulated number of COVID-19 cases, including they Russian Federation, Turkey, Iran, Indonesia, and the Philippines (Figure 7.18).

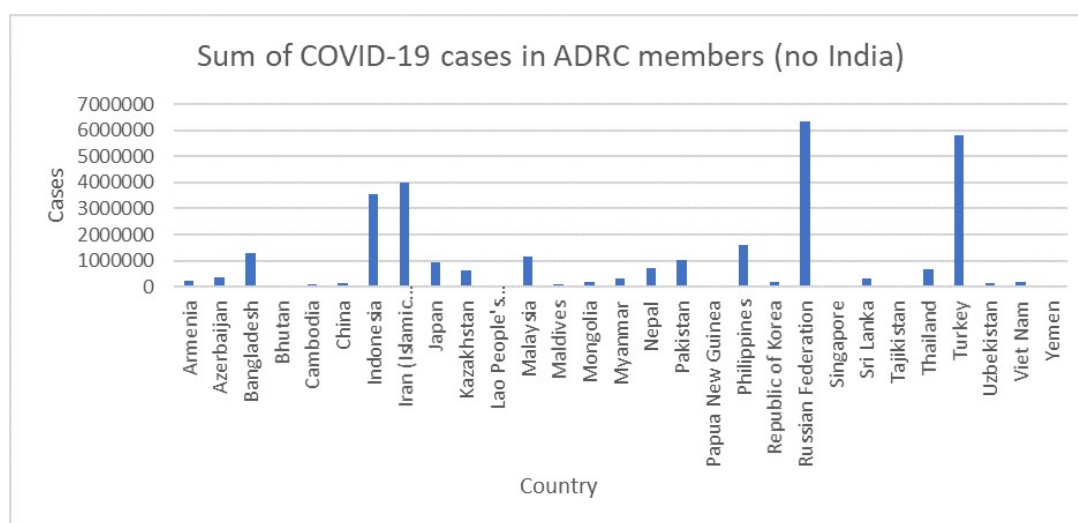


Figure 7.18 COVID-19 cases in ADRC member countries without India in the graph  
(WHO, 2022)

Essentially, internal policies for navigating the coronavirus situation differs with each ADRC member country. For example, strictness of COVID-19 countermeasures or harshness of penalties for breaking medical advice contribute in the spike or control of cases.

As of 7 July 2022, there has been a declining trend of deaths from COVID-19 in ADRC member countries compared to the time when the pandemic began. Factors contributing to the decline of the number of deaths could include vaccination, weaker virus strain, and improvement in medical system in handling COVID-19

cases. Among the ADRC countries that exhibited higher cumulative number of deaths from COVID-19 includes Armenia, Indonesia, Russian Federation, and Thailand (Figure 7.19).

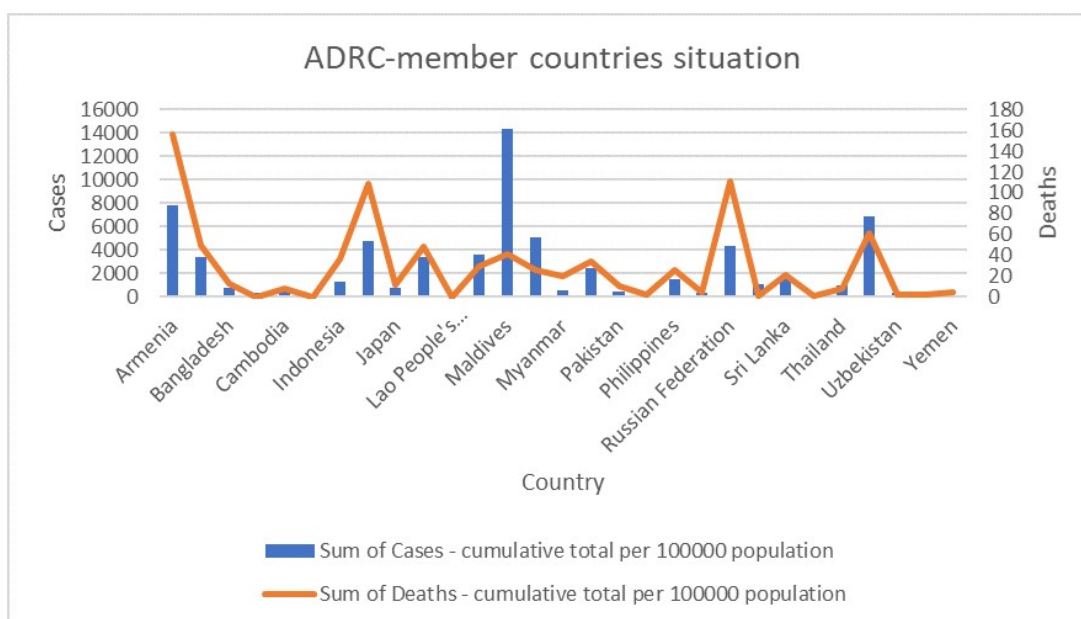


Figure 7.19 COVID-19 situation in ADRC member countries (WHO, 2022)

# Annexes

## History of Establishment of ADRC

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

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

### **1994: World Conference on Natural Disaster Reduction**

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

### **1995: Ministerial-level Asian Natural Disaster Reduction Conference**

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

### **1996: Asian Natural Disaster Reduction Experts Meeting**

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

### **1997: Asian Disaster Reduction Cooperation Promotion Meeting**

Again, the Government of Japan and the IDNDR Secretariat jointly organized a meeting in Tokyo in June 1997 to discuss activities to be undertaken by the proposed center for disaster reduction system. Likewise, the key personnel from the disaster reduction bureaus of 23 countries attended the meeting with an overall goal of promoting cooperation in disaster reduction efforts through specific actions. A proposal was made at the meeting to establish a center in Japan to serve as the secretariat for the proposed system.

### **1998: Establishment of ADRC**

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

## Overview of International Recovery Platform

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

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

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

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

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



Logos of IRP SC Members

## Notes on Sources of Data for the Natural Disaster Databook

### Natural Disaster Data

All disaster data are based on EM-DAT: The Emergency Events Database - Université catholique de Louvain (UCL) - CRED, [www.emdat.be](http://www.emdat.be), Brussels, Belgium. Data set was obtained on 7 July 2022, unless otherwise stated.

#### *EM-DAT Criteria:*

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

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

Databook 2021 follows the EM-DAT definitions of “people killed” as persons confirmed as dead and persons missing and presumed dead; “people affected” as the sum of injured, homeless, and affected requiring immediate assistance during the period of emergency and requiring basic survival needs such as food, water, shelter, sanitation and immediate medical assistance.

#### *Disaster Terms:*

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

**Earthquake** includes ground shaking and tsunamis.

**Epidemic** includes bacterial and viral infectious diseases.

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

**Flood** includes general flood, and flash flood.

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

**Landslide** includes avalanche, debris, and rockfall.

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

**Volcanic activity** means volcanic eruption.

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

#### *Classification of EM-DAT:*

EM-DAT distinguishes between two generic categories for disasters: **natural** and **technological**. The natural disaster category is divided into 5 sub-groups, which in turn cover 15 disaster types and more than 30 sub-types. The technological disaster category is divided into 3 sub-groups which in turn cover 15 disaster types, <https://www.emdat.be/classification>

## COVID-19 Data

All COVID-19 data used in the Databook 2021 is based from the World Health Organization Coronavirus (COVID-19) Dashboard, <https://covid19.who.int/> accessed on 7 July 2022.

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

Some ADRC member-countries have no record of COVID-19 data in the WHO COVID-19 Dashboard.

## Key Determinants for Considered in Analyzing the Databook

In analysing the natural disaster data, ADRC is mindful of these four key determinants.

**Population.** It is clear that population affects the presentation of disaster profile of a country, region, or continent. EM-DAT's criteria for a disaster is when an event kills 10 or more people or affects 1,000 or more. If it is considered that a disaster occurs at the intersection of a natural hazard and a vulnerable population, a key facet of both of these parameters is the number of individuals exposed. Therefore, countries with larger populations would see a higher probability of disaster occurrence. Therefore, it would be logical for China and India to have the greatest weight on the parameters (e.g., total affected and total deaths), which the data supports.

**Level of development.** Countries that belong to the higher level of the development spectrum (usually correlated with GDP) accumulate capital and assets of higher value. This exposes them to heightened economic risk. Therefore, developed countries usually top the list when assessing total damages. The data supports this in such a way that the top three most damaging (USD value) disaster events to date were the Great Hanshin Awaji Earthquake of 1995, Hurricane Katrina of 2005, and the Great East Japan Earthquake of 2011.

**Socio-political condition.** Another EM-DAT criterion for a disaster is when the government declares a state of emergency and calls for international assistance. However, since there are different bases and thresholds for national governments to declare state of emergency and call for international assistance, it is likely that the socio-political condition comes into play. Therefore, it possible that the inclusion of some events is dependent on value judgements in a given socio-political condition.

**Statistical timestamp bias.** In this Databook, disaster data of 2021 is compared with the annual average of disaster data from 1990-2020. While valuable conclusions may be made from the 2021 disaster data, it is susceptible to disproportionate representation of individual events. On the other hand, the average data of 1990-2020 is susceptible to under-representation of disaster events.