2. Highlights of FY 2023

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

2.1 Activities in Figures

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

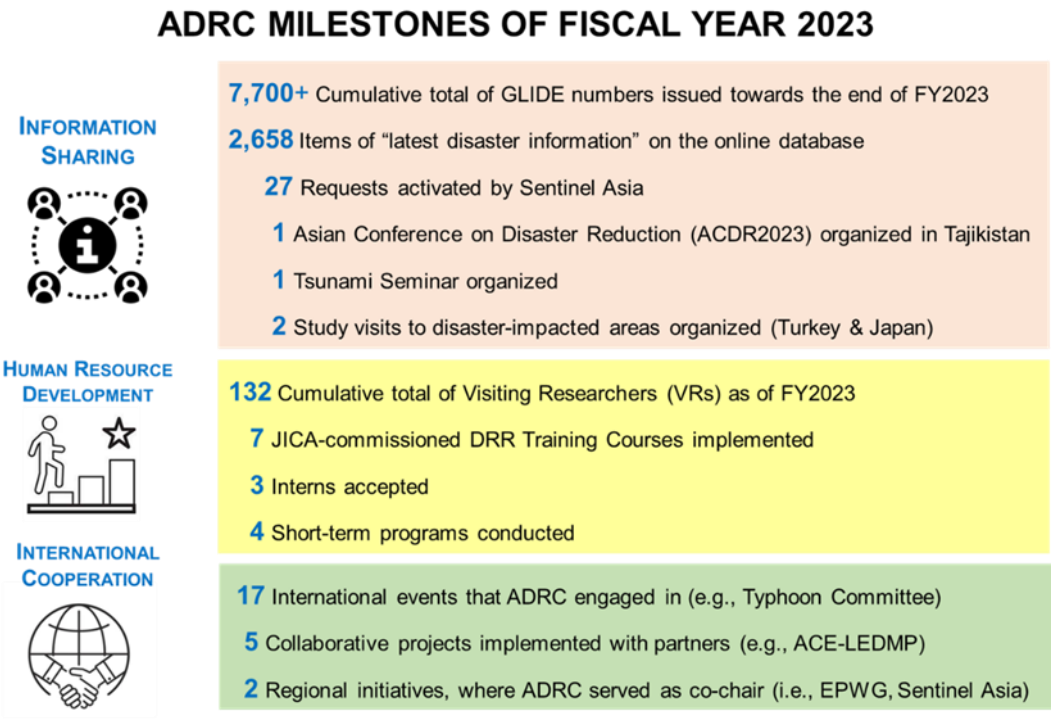

Figure 2.1 Highlights of ADRC Activities in FY 2023

2.2 Asian Conference on Disaster Reduction 2023

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

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

- Thematic Session 1: Innovative Solutions for Resilient Societies: DRR Technologies for Earthquakes and Geological Hazards
- Thematic Session 2: Adaptation to the Climate Crisis: Innovative Approaches to Monitoring and Responding to Glacial Lake Outburst Floods (GLOFs) and Intensifying Floods

Figure 2.2 ACDR2023 Group Photo

2.2.1 Opening Session

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

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

Ms Sattoriyon Matlubakhon Amonzoda
Deputy Prime Minister
Republic of Tajikistan

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

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

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

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

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

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

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

Mr Rustam Nazarzoda
Chairman, CoES
Republic of Tajikistan

2.2.2 Roundtable Session

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

Mr Rustam Nazarzoda
Chairman, CoES
Republic of Tajikistan

Ms TSUNOZAKI Etsuko
Board Member, SEEDS Asia

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

Figure 2.3 Co-chairs of the Roundtable Session

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

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

Figure 2.4 Government officials who delivered statements at the Roundtable Session

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

- Scale-up sharing of policies and measures that promote DRR efforts in a coordinated manner, particularly on policies relating to disaster database, early warning, and community-based disaster risk management as well as measures relating to information management systems, regional knowledge sharing, and disaster response mechanisms.
- Promote sub-regional cooperation in addressing complex and transboundary disaster risks, particularly earthquakes, floods, and typhoons.
- Forge partnerships and joint projects in the areas of hazard and risk identification, mapping, and assessments in a manner that puts greater emphasis in science-based approaches and embrace digital technologies for multi-hazards disaster risk reduction.

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

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

Mr Pulod Aminzoda
Director, IGEES/NAS
Republic of Tajikistan

Dr Sos Margaryan
Director, NSSP
Armenia

Figure 2.5 Co-chairs of Thematic Session 1

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

Mr Pulod Aminzoda
Director, IGEES/NAS
Republic of Tajikistan

Mr Ulan Abdybachaev
Deputy Head, CAIAG
Kyrgyz Republic

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

Mr Dilshod Kodirov
National Coordinator
UNDRR in Tajikistan

Mr Azizjon Azizmurodzoda
Researcher, CoES
Republic of Tajikistan

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

Figure 2.6 Speakers of Thematic Session 1

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

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

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

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

Dr Changje Kwak
Research Scientist, NDMI
Republic of Korea

Figure 2.7 Co-chairs of Thematic Session 2

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

Figure 2.8 Speakers of Thematic Session 2

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

2.2.5 Closing Session

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

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

Mr SASAHARA Akio
Executive Director
Asian Disaster Reduction Center

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

Dr OGAWA Yujiro
Executive Secretary
Asian Disaster Reduction Center

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

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

2.3 Study Visit to the 2023 Türkiye Earthquake-Affected Areas

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

- Observe the impacts, challenges, and lessons from the earthquake disaster
- Gain insights on improving the DRR plans of ADRC member countries
- Facilitate knowledge and information exchange

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

Figure 2.9 Members of the study team

2.3.1 Fault movement

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

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

2.3.2 Housing recovery process

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

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

(1) Gaziantep Province: Atalar

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

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

(2) Kahramanmaras Province: Onikisubat

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

Figure 2.12 State buildings in Onikisubat, Kahramanmaras

(3) Hatay Province: Kirikhan

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

Figure 2.13 Construction of apartment buildings in Kirikhan, Hatay Province

2.3.3 Key observations

Lessons learned from the study visit are summarized below:

- Liquefaction caused serious damage to buildings (e.g., settlement and tilting). This means that construction of more than 5-storey buildings in shallow foundations should consider soil improvement techniques against liquefaction
- In future planning and construction, full consideration should be given to the distribution and movement patterns of faults as well as the impact of hydrological and geological conditions on secondary disasters
- The main cause of the collapse and heavy damage to reinforce concrete (RC) buildings during the 2023 earthquakes are the same as those of the previous Turkish earthquakes: a) lack of implementation of seismic codes in structural design, b) construction mistakes, negligence, and lack of moral, c) poor workmanship, d) soft floors, e) resonance phenomenon due to ground conditions, f) pounding of adjacent buildings, and g) liquefaction of ground
- Housing reconstruction approach is contractor-driven (i.e., private companies are contracted by the government to build the permanent house buildings).
- Permanent house buildings are built in relocation sites, as identified by the local governments in the areas.
- While many permanent house buildings are being constructed, some container cities are not yet ready to be occupied.
- There remains a huge task of demolishing severely damaged buildings in all three provinces.

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

2.4 Report on the 2024 Noto Peninsula Earthquake

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

2.4.1 Issuance of GLIDE number

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

2.4.2 Satellite imageries

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

More satellite images are on this link: https://sentinel-asia.org/EO/2024/article20240101JP.html

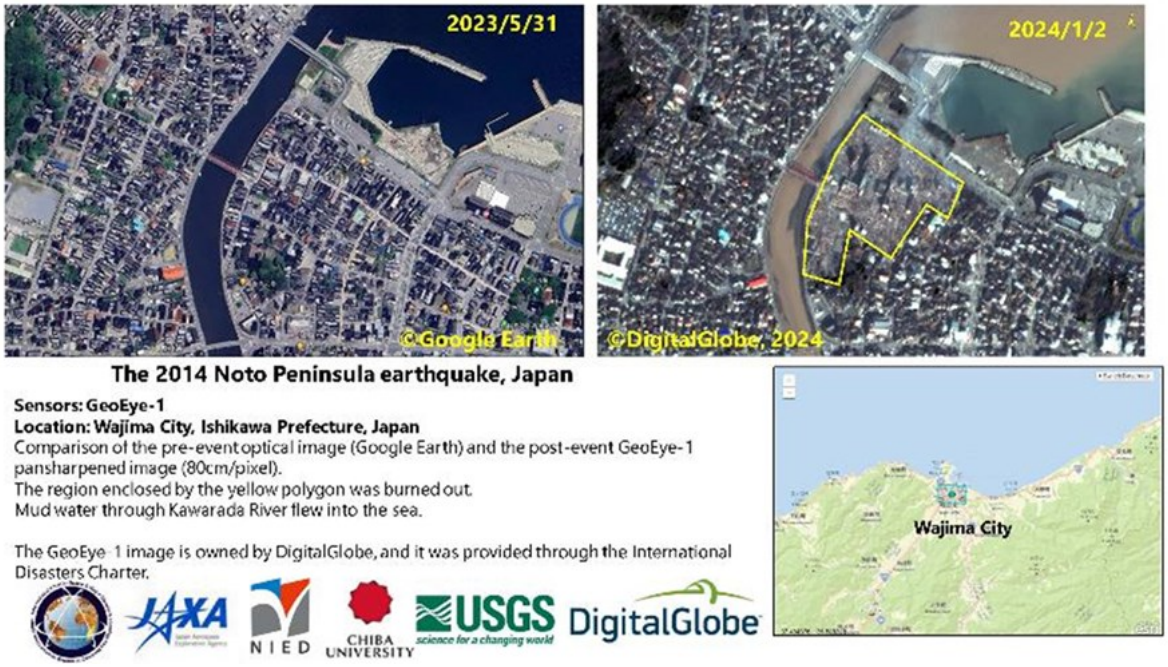

Figure 2.14 Example of analysed satellite images shared by ADRC as member of IDC

2.4.3 Assessments

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

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

Figure 2.15 Initial assessment information from the Ishikawa Prefectural Government

2.4.4 Study Visit to Noto Peninsula Earthquake-Affected Areas

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

- Damages from the earthquake and tsunami, and the procedures for assessment
- Ongoing recovery efforts, and its challenges

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

Route on 14 March 2024 (Thu)

Route on 15 March 2024 (Fri)

Figure 2.16 Areas visited by the team on 14 -15 March 2024

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

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

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

2.5 Japan Visit to the ACE-LEDMP Middle Level

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

Figure 2.18 Participants of the ACE-LEMP Middle-Level

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

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

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

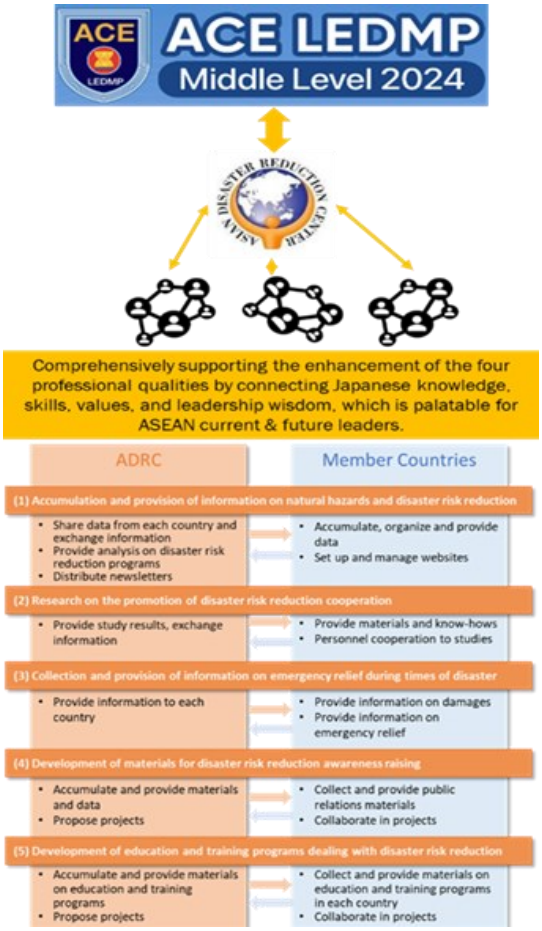

Figure 2.19 ADRC's Approach to the ACE-LEDMP Study Visit to Japan

A total of 20 middle level managers from nine ASEAN member states (AMS), each with more than five year of experience working in disaster management organizations in their country, participated in the Study Visit of this time along with 4 staff members from the AHA Centre. They received lectures from the Cabinet Office of the Government of Japan, Hyogo Prefecture, Sumida City Office in Tokyo, the International Recovery Platform (IRP) and ADRC. They also visited Koshigaya Lake Town and the Disaster Reduction and Human Renovation Institution (DRI) to deepen their understanding of Japan's disaster management policies. During the concluding session of the visit, the participants discussed the future promotion of further disaster reduction measures in the ASEAN region, drawing insights from the lessons learned in Japan. The Study Visit to Japan offered valuable hands-on learning experiences, fostering cultural exposure, networking opportunities, team collaboration, enhancing the appreciation of the subject matter, creating a holistic and enriching approach to disaster risk management.