Asian Disaster Reduction Center
2016 ANNUAL REPORT

Foreword

Many valuable lives were lost and people‘s livelihoods were affected by earthquakes, floods, landslides, and other disasters in fiscal 2016. On 15 May, for example, a severe tropical storm hit Sri Lanka and caused floods and landslides, killing at least 99 people and leaving 104 people missing. More focus should be placed on disasters resulted from the global climate change in DRR policy making, and awareness and efforts at community level have become increasingly important to explore DRR measures adapted to individual regions.

In order to learn directly from the realities facing disaster hit areas, ADRC has organized research teams and joined study visits and projects soon after major natural disasters including those for the Gujarat Earthquake in 2001, the Indian Ocean Earthquake and Tsunami in 2004, the Great East Japan Earthquake in 2011, the Nepal Earthquake in 2015, and so on. In December, 2016, ADRC organized a study visit to the affected areas by Kumamoto Earthquakes in April, 2016, together with 23 member countries. It was thanks to prefecture of Kumamoto, city of Kumamoto and many other collaborators working for the affected areas. ADRC will continue to explore diverse possibilities of participative recovery and reconstruction through the lessons learnt from natural disasters in the past.

In addition to locally based efforts, global views and cross border collaboration is becoming more and more important considering risks of mega disasters such as the Indian Ocean Tsunami that directly hit more than 10 countries. At the same time, a small scale disaster could indirectly affect livelihood in neighboring countries, as our economic activities are closely connected with each other today through production and supply chain worldwide. ADRC thus needs to collaborate with colleagues in many countries, and would like to contribute further to networking in the world.

ADRC was established in Kobe in July 1998, and in 2018, will thus celebrate the 20th anniversary. As ADRC chairman, I sincerely appreciate your cooperation and would like to invite you to join us in discussing the future of DRR in Asia, together, to build a more resilient society for another 20 years.

March 2017

Masanori Hamada, Chairman

Asian Disaster Reduction Center

Contents

1. Asian Disaster Reduction Center

1-1. History of the Establishment of ADRC

Asian Disaster Reduction Center (ADRC) opened its office in Kobe, Japan, on July 30, 1998. The major steps leading up to formation of ADRC are described below.

(1) International Decade for Natural Disaster Reduction (IDNDR)

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

(2) 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. Disaster reduction activities have since been promoted throughout the world based on this strategy.

(3) 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.

(4) Asian Natural Disaster Reduction Experts Meeting

The government of Japan and the IDNDR Secretariat jointly organized an expert meeting in October 1996 to hash 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" to serve as a secretariat for promoting activities under the proposed system.

(5) Asian Disaster Reduction Cooperation Promotion Meeting

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

(6) Establishment of ADRC

With momentum gathering from this 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, the Asian Disaster Reduction Center was officially established in Kobe on July 30, 1998.

1-2. Composition

ADRC was established in Kobe, Hyogo prefecture, in 1998, with mission to enhance disaster resilience of the member countries, to build safe communities, and to create a society where sustainable development is possible. ADRC works to build disaster resilient communities and to establish networks among countries through many programs including personnel exchanges in this field.

The Center addresses this issue from a global perspective in cooperation with a variety of UN agencies and international organizations/initiatives, such as the United Nations Secretariat for International Strategy for Disaster Reduction (UNISDR), the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP).

At the outset, ADRC was comprised of 22 member countries, four advisor countries, and an observer organization. Armenia joined later, in August 2000, followed by the Kyrgyz Republic in July 2002, Pakistan in July 2005, and Yemen and Bhutan in December 2007, Azerbaijan in 2009, Maldives in 2010, and the Republic of Iran in 2012 bringing the number of member countries to 30. In March 2004, the US joined as the fifth advisor country to ADRC.

30 Member Countries: Armenia, Azerbaijan, Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Islamic Republic of Iran, Japan, Kazakhstan, Republic of Korea, Kyrgyz, Lao PDR, Malaysia Maldives, Mongolia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Russian Federation, Singapore, Sri Lanka, Tajikistan, Thailand, Uzbekistan, Viet Nam, Yemen **5 Advisor Countries:** Australia, France, New Zealand, Switzerland, United States of America **Observer:** Asian Disaster Preparedness Center (ADPC)

Table 1-2-1 Counterpart List of member countries

country	organization
Armenia	National Survey for Seismic Protection (NSSP)
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 Agency for Disaster Management (BNPB)
Iran	National Disaster Management Organization (NDMO)
Japan	Cabinet Office
Kazakhstan	Ministry of Internal Affairs
Rep. of Korea	Ministry of Public Safety and Security
Kyrgyz	Ministry of Emergency Situations
Laos	National Disaster Management Office (NDMO)
Malaysia	National Security Council, Prime Minister's Department
Maldives	National Disaster Management Center
Mongolia	National Emergency Management Agency
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	Department of National Defense
Russia	Ministry of Russian Federation for Civil Defense, Emergencies and Elimination of Consequences of Natural Disasters
Singapore	Singapore Civil Defence Force
Sri Lanka	Ministry of Disaster Management
Tajikistan	Committee of Emergency Situations and Civil Defense
Thailand	Ministry of Interior
Uzbekistan	Ministry of Emergency Situations
Viet Nam	Ministry of Agriculture and Rural Development
Yemen	Ministry of Water & Environment

Fig. 1-2-1 Member Countries

1-3. Main Activities

ADRC engages in the following basic activities:

(1) Information Sharing

- Provision of disaster information
- Sentinel Asia – A space-based disaster management support system in the Asia-Pacific region
- Promotion of the GLobal unique disaster IDEntifier (GLIDE) system
- Organization of international meetings

(2) Human Resource Development

- Organizing conference, workshops, and trainings on disaster risk reduction
- Program for inviting visiting researchers from member countries

(3) Building Community Capabilities

- Development and dissemination of tools for encouraging community involvement
- Development of Public and Private Partnership and Business Continuity Plan (BCP) for small and medium-sized enterprises
- Assistance with the activities to further strengthen all stakeholder coordination mechanisms

2. Highlights of 2016/2017

2-1. ADRC study visit to the affected areas by Kumamoto Earthquakes

2-1-1. Overview

On 14 and 16 April 2016, earthquakes occurred in the middle of Kyushu Island, in southwestern Japan, measuring a magnitude 7 (the highest level) on the seismic intensity scale of the Japan Meteorological Agency (JMA). The quakes caused 161 deaths in Kumamoto prefecture and 8,369 houses were totally destroyed in Kumamoto and Oita Prefectures (as of 14 December 2016, Emergency Disaster Response Headquarters). The direct economic losses are estimated at ¥2.4–4.6 trillion (Kumamoto Prefecture estimated \3.8 trillion).

ADRC has made maximum efforts to visit the affected areas in member countries by natural disasters. So far, study visits together with ADRC member countries include the case after the Gujarati earthquake in India in January 2001, and the case for the Indian Ocean Tsunami in 2004.

At the time of the Kumamoto Earthquakes, an ADRC survey team visited the affected site from 18-21 May 2016, two month after the occurrence of the events, in cooperation with relevant organizations. ADRC compiled the overview of the earthquakes and damage based on the basic information provided by relevant authorities and also shared the report among member countries.

Furthermore, Cabinet office, together with ADRC organized a study visit targeting for DRR officials from ADRC member countries in December 2016 based on the previous surveys.

2-1-2. ADRC Steering Committee meeting in Kumamoto

Prior to the ADRC study visit to the affected areas by the Kumamoto earthquakes, on December 19th in Kumamoto City, an ADRC Steering Committee meeting took place. The SC meeting, attended by 23 ADRC member countries focused on future of ADRC and DRR priorities for its member countries and actively exchanged views towards its 20th anniversary in 2018.

Fig. 2-1-1 ADRC steering committee meeting in Kumamoto

2-1-3. Study visit to the affected areas by the Kumamoto

ADRC study visit to the affected areas of the Kumamoto Earthquakes was organized on 19 to 20 December, 2016 and attended by 29 participants from 23 countries, and many academics and participants from the private sector in Japan.

During the two days' study visit, a briefing session was organized in the morning, followed by the

relevant visits in the afternoon on both 1st and 2nd day. Day1 started with a key note lecture by Professor Makoto Iokibe, chairman of the Advisory Committee for Recovery and Reconstruction of Kumamoto, followed by a briefing by Kumamoto prefecture and that by Kyushu Regional Development Bureau, Ministry of Land, Infrastructure, Transport and Tourism, MLIT. In the afternoon, participants visited Mashiki Town that was one of those damaged most severely, and the collapsed Aso bridge area under unmanned operation there.

Fig. 2-1-2 Group photo the participants of the study visit

Day 2 focused on Kumamoto castle, on which Kumamoto city first provided a introductory briefing on the damages on the cultural heritages, and three sub session took place on emergency relief, evacuation and challenges facing evacuees, and on recovery, reconstruction and BBB. Member countries reported about their experiences and discussed actively the four themes.

Day 1 morning : Status of the affected areas and DRR effort

Day one, 19th, December started with an opening remark by Professor Masanori Hamada, by representing ADRC. Chairman of ADRC highlighted three key aspects of the Kumamoto earthquakes. First, the previous strong quake followed by the main shock, secondly rescue and recovery activities facing continuous aftershocks, and damages on cultural heritages. Ms.Setsuko Saya, Director of Cabinet Office, Japan, then gave another opening speech and a presentation on the government efforts facing the Kumamoto earthquakes by summarizing the report by Cabinet office titled “Emergency relief and assistance for the life of the affected by learning from the Kumamoto Earthquakes (December 20th 2016,).

1 Keynote speech : Professor Makoto Iokibe, “Japan facing mega disasters: Steps towards overcoming the challenges”.

Professor Makoto Iokibe, chair of the Reconstruction Design Council in Response to the Great East Japan Earthquake, Chancellor, Prefectural University of Kumamoto, and President of Hyogo Earthquake Memorial 21st Century Research Institute who made efforts for recovery and reconstruction of Hyogo, made a key note speech titled “Japan facing mega disasters : Steps towards overcoming the challenges”. Professor Iokibe has been working as the chair of the Advisory Committee for Recovery and Reconstruction of Kumamoto, as well.

Professor Iokibe, after talking about the experiences of Great Hanshin Awaji Earthquake and the Great East Japan Earthquake, stressed the importance of learning from the lessons learnt from the disasters in the past. As Japan saw many mega disasters in its history, evidence based studies on disasters in the past will constitute the basis of DRR system, facing recent growing threat of water related disasters. Considering the occurrence of the Great Hansin Awaji earthquake and the

Great East Japan Earthquake in these decades, more intense earthquakes could happen in these 20 to 30 years. Impacts of earthquakes and tsunami in the future could however be reduced by taking well into consideration of the following three points:

1) Getting better prepared against natural disasters by raising awareness and building capacity to overcome natural disasters
2) Building early alert system by using mobile phone and so on
3) Learning from history and experiences in the past including those of "mutual help", "push mode assistance", "creative recovery" or "Build back better".

2 Presentations

1) Kumamoto Prefecture

Kumamoto prefecture then presented the overview of the Earthquakes and measures taken by the prefecture including those for recovery and reconstruction. Mr. Honda, Director General on Crisis management, Office of governor, first reported the nature and characteristics of the Earthquakes compared to those of Great Hanshin Awaji, or the Great East Japan. The case of Kumamoto is characterized by the two quakes of level seven in 28 hours, many aftershocks, large share of the affected population amounting to 83 %, and the maximum share of evacuees amounting to 10.3 % of the total population.

The prefecture gave positive evaluation regarding collaboration with relevant parties and provision of temporary housing units by reflecting the evacuees' opinion, while they find that further efforts will be necessary regarding key DRR facilities including DRR centers, truck roads and lifelines that had been affected. In addition, awareness rising targeting residents should have been more strengthened, lack of which has led to poor preparedness against natural disasters among residents. Finally, Mr. Honda made a presentation on their efforts of recovery and reconstruction including their vision for reconstruction.

2) Kyushu Regional Development Bureau, MLIT "Relief and restoration effort of the Aso Ohashi district landslide"

Kumamoto Earthquake Counter plan Office, Kyushu Regional Development Bureau, MLIT reported about the status of recovery of the slopes significantly collapsed at the Aso Bridge area. On 16th April, due to the main shock, large volume of sand extending 700 m length and 200 m width collapsed, and Aso Bridge together with Japan railway line and National road no.57. Aso Bridge directly supporting people's life, widely used by tourists, should get recovered immediately . In order to avoid secondary disaster; however, unmanned method applied at the occasion of the Mount Unzen volcano eruption is used for removing sands left on the slopes. Participants visited this area in the afternoon of Day1.

3) Extensive support to Kumamoto by Union of Kansai Governments

Mr. Hiroaki Okubo, Superintendent of Emergency Management, Hyogo Prefecture and Director General, Region-wide Disaster Preparedness Office, Union of Kansai briefed about the

support for Kumamoto made by the Union of Kansai. The Union of Kansai dispatched three persons 90 minutes after the first quake already, opened soon after the main shock on-site headquarters in the Kumamoto Prefecture office, and started coordinating with Kyushu region governors association regarding the recipients. By 19th July, they dispatched in total 6,948 officials except policemen, firemen, and medical staff, to the affected areas and provided relief supplies and support staff.

They organized support teams including emergency and rescue team comprised of public school faculty and staff known as "EARTH", assistance for evacuation centres, medical support, and waste treatment and sanitation. In addition, human resources were sent for housing damage assessment, helpdesk services for citizens, and so on. He then raised the necessity of sharing of know-how, standardization of the activities, and collaboration with private sector based on the lessons throughout the assistance for Kumamoto.

Day 1 afternoon : Study visits

1. Mashiki Town

Mashiki town, developed as a residential area of the city of Kumamoto and home to 34,600 population as of February,2017, was affected by the two quakes of level 7. Death toll including those relevant amounted to 27 and 2,768 houses were totally destroyed, 3,033 partially destroyed.

Evacuees increased to reach 16,050 accommodated into 10 evacuation centers. From June 14th they started to move to temporary housing amounting to 1,562 in 18 areas. There located also community centers so as to avoid isolation of the residents.

From July 7th, the town started dismantling and removing the houses assessed as half-damaged or more severely damaged by the disaster certificate, and adopted a "Basic principles of Mashiki town recovery" on the 6th July to present basic idea. During the visit, participants visited the affected town hall, had a brief walk in the most severely affected areas, and visited the largest temporary housing area "Techono area" and a community center, where they had a briefing and discussion.

Fig. 2-1-3 Emergency Temporary House (Techno Area Temporary multi-unit apartments "Minna no Ie")

2. Collapsed Aso bridge area

Participants visited the collapsed Aso Bridge area. They had an on-site briefing on the operation to remove unstable sand by using unmanned machine, and visited also a small temporary office where they were remotely operating the unmanned machines. Kumamoto branch office also presented the plan for recovery including

Fig. 2-1-4 Landslides in Aso Bridge

building of a new bridge.

Day 2 morning : Lessons learnt from member countries to support Kumamoto

1. Subsession 1 : Damage to cultural heritages and participatory process for recovery through encouraging tourism

After a brief introduction by the delegate from Ministry of Home Affairs, Nepal, Mr. K. Mishima, General Manager of Tourism and Exchange Department, City of Kumamoto reported about the damage to Kumamoto castle and challenges for its recovery.

The castle, visited annually by 1.7million visitors is one of the most important tourist destinations in Kumamoto, composed of various important cultural heritages. He summarized by using photos the damages by the Earthquakes and challenges towards recovery. The Earthquakes affected the stone walls, turrets , gates and tiles including those designated as the important cultural heritages. The keys for recovery of the castle include: 1) Promoting recovery works by focusing on safety as well as protection of cultural heritage and tourism, 2) Reinforcing the stone walls and other walls by using both traditional methods and cutting edge technologies, and 3) Developing routing well considering safety of tourists, designating evacuation passages and installing facilities for DRR. He says “It may take more than 20 years for perfect recovery, we will thus accelerate delivery of measures so as to use the Castle as a resource for tourism.

Mr. Yang Dorji,Chief Programme Officer, Ministry of Home & Cultural Affairs, Bhutan, then made a presentation on the damages on cultural heritage by natural disasters in Bhutan, followed by Ms. Sang Khov, Deputy Secretary General, National Committee for Disaster Management Council Minister, who talked about protection of cultural heritage, in particular, Angkor Wat, from natural disasters by controlling the number of tourists, training security guards, and awareness raising targeting tourists, in order to limit the damages caused by natural disasters.

2. Subsession 2 : Effective emergency response

Commissioner Mr. Wee Teck Eric Yap, Singapore Civil Defense Force moderated the subsession and Philippines, Myanmar and Indonesia contributed to the session by provided recent cases of disasters. First, assistant Secretary Rodolfo Demosthenes Centeno Santillan, Office of Civil Defense, Philippines, presented the emergency relief measures against Typhoon Haiyan in which existing plan or preparedness measures did not work due to the scale of the disaster. Ms. Nilar Htun, Ministry of Social Welfare, Relief and Resettlement, Myanmar briefed about the DRR system in the country, followed by a report by Dr. Raditya Jati, BNPB, Indonesia on the earthquake in Aceh on 17th December, 2016. He stressed that the availability of risk map contributed to immediate response when the earthquake happened and that assistance by AHA centre was available for coordination. At the end of this subsession, Ms. Setsuko Saya, Cabinet Office asked the Philippines the organisations issuing evacuation order and the Philippines replied that it would be governors. Vietnam asked whether emergency plans are prepared against

all the scales of typhoon. Philippines answered that plan is made for all types of typhoon regardless of the scale.

3. Subsession 3 : Evacuation and rehabilitation : Facing societal changes and increasing diversity

This session moderated by Mr. Badral Tuvshin, Chief, National Emergency Management Agency of Mongolia, started with a presentation by Ms. Tomomi Katsuya, Deputy Secretary-General, Kumamoto International Foundation on "Support for non-Japanese residents and tourists throughout evacuation and recovery phases". After the earthquakes, 200 non-Japanese people came to the international centre in Kumamoto City seeking for information on transport measures to leave Kumamoto. Information disseminated after the disaster was largely in Japanese, Centre thus replied in many other languages and collected and provided information to non-Japanese people in need of information. Throughout the study undertaken after the Earthquakes, they have learned that daily contacts with non Japanese people is a key for effective emergency operation.

Mr. Md. Zakir Hossain Akanda, Ministry of Disaster Management and Relief, Bangladesh compared his impression in Mashiki town and the experiences in his country. Dr. Yujiro Ogawa, Representative of Bosai International and former ED of ADRC followed up the study visit of Day 1 to Mashiki town. He drew attention to emergency housing damage assessments for all the houses after a disaster, which has three grades of dangerous, caution and checked. He pointed out several problems for smooth issuance of disaster certificate, requesting payment of earthquake insurance, and so on.

Finally, Associate Professor Akira Takagi, University of Kumamoto, who had opened together with his students a volunteer based Café "Ohisama" in the Techno temporary housing area, in Mashiki Town, briefed about his activities . The café was opened for the purpose of encouraging activities by themselves, and supporting evacuating children by providing the space for children. The activities have been supported by students' voluntary activities and based on donation and subvention. They changed however their policy and start charging the fee from the users of the café in order to continue the activities that require funding.

4. Theme 4 : Recovery, reconstruction and Build Back Better

Mr. Sena Srinath Miyanawala, Permanent Secretary to the Ministry, Sri Lanka, opened the subsession as moderator, and Mr. Suporn Ratananakin, Disaster Management Specialist of Department of Disaster Prevention and Mitigation, Ministry of Interior, Thailand reported about the flood in 2011 damaged also the worked heritage of Ayutthaya. Ayutthaya, surrounded by the three rivers, left flooded for three months, was damaged by erosion and salt damage. More than 100 historical monuments were affected, which raised significant concerns among the experts.

The second speaker, Mr. Vigen Harutyunyan, Head of Department, Data Acquisition Processing and Analysis, Center of Seismic Hazard Assessment, Western Survey for Seismic Protection, Ministry of Emergency Situation briefly explained about the damages caused by the

Spitak earthquake in 1988 including the major factor bringing about the damages, which includes absence of construction standard, leading to poor architectural method.

During the discussion, Indonesia asked Thailand about the indirect damages over the communities located in Ayutthaya and build back better. Mr. Ratananakin, Thailand replied that they have a plan to relocate the communities outside Ayutthaya, as well as the importance of awareness raising about the value of Ayutthaya and provision of job opportunities. At the end, participants shared the situation in member countries regarding the gaps between the reality and expectation due to the time necessary for recovery.

Day 2 afternoon : Status of Kumamoto Castle after the Earthquakes

Afternoon of Day 2 was dedicated to the visit of the Kumamoto castle site that was closed after the disaster, thanks particularly to the city of Kumamoto. Regarding Kumamoto Castle, amongst all, wooden turrets of Udo and Higashijuhakken, Fukai gate and so on are designated as "national important cultural properties", and the Kumamoto castle site including ramparts designated as national "Special historic site. The Earthquakes affected 13 "national important cultural "monuments" leading to significant damages including collapse of the building and walls. In order to accelerate recovery works that may last more than 20 years, a long term plan will be adopted in the coming fiscal year. The visit provided precious opportunities for the participants to enter the site of the affected cultural properties, where they saw, for example, the Iidamaru-gokai turret located on a collapsed stone wall, dependant on the only one pillar surviving the Quakes, and sustained by a heavy operational vehicle.

Fig. 2-1-5 Observation on Kumamoto Castle

Towards the future

During the visit, one of the focuses was longer term participative recovery by involving tourists from abroad as well as from Japan, regarding recovery of Kumamoto. Good practices of participative recovery through tourism and wide participation by citizen include, amongst all, the case of DRI after the Hanshin Awaji Earthquake, Sanriku railroad after the Great East Japan Earthquake in Japan, while cases of abroad include New Orleans after *the* Hurricane Katrina, *and th*e case of Mt. Pinatubo. It will be important to explore further various possibilities of participative recovery. Themes that should be studied further, based on the outcome of the study visit include:

- ✓ Sharing disaster experiences and disaster education
- ✓ Evacuation friendly to vulnerable people and challenges
- ✓ Possibility of disaster tourism for the reconstruction of affected areas
- ✓ Impact on the supply chain of Kumamoto, Kyushu, and the Asian region

- ✓ BCP targeting local governments and small and medium-sized enterprises
- ✓ Strengthening of local DRR information infrastructure by using cutting-edge technology such as satellite imagery and ICT equipments.

2-2. Promotion of World tsunami awareness day

2-2-1. Background of ADRC Tsunami DRR workshops

Based on the UN Resolution designating November 5th as the World Tsunami Awareness Day, a new series of awareness raising activities have been initiated by UNISDR, government of Japan, and many other relevant countries and international organizations. ADRC, together with Cabinet Office had long been undertaken Tsunami DRR since the Indian Ocean Tsunami in 2004 by dispatching teams to investigate the damages in collaborating with ADRC counterparts and published awareness raising material of “Inamurano-hi” in more than 10 languages.

In order to further promote tsunami DRR and the World Tsunami Awareness Day, in the fiscal year 2016, two workshops on tsunami DRR were held, one in Lima, Peru and another in Krabi, Thailand for the purpose of sharing lessons learnt from tsunami in the past and discussing future challenges towards effective tsunami disaster risk reduction through multi-sectoral and inter-disciplinary efforts.The former highlighted effects of tsunami on economy and supply chain as well as tsunami DRR policies, while the latter addressed the challenges at local and community level facing tsunami.

2-2-2. Workshop focusing on tsunami DRR policies at national level Tsunami Disaster Risk Reduction in APEC economies

The workshop was organized by ADRC in collaboration with INDECI, Peru and Cabinet Office, Japan, back to back APEC emergency preparedness working grope, EPWG meeting during August 15-16, in Lima.The purpose of the workshop included:

1) Identifying the status of anti-tsunami policies and measures
2) Discussing major challenges
3) Strengthening partnership with private sector in promoting anti-tsunami measures.

It was attended by USA, Vietnam, Chile, Philippines, Chinese Taipei, Thailand as well as Peru and Japan. Participants discussed a wide range of tsunami DRR policies, challenges and trans border effects through supply chain. Private sector in Peru and JICA also provided inputs on their tsunami DRR efforts.

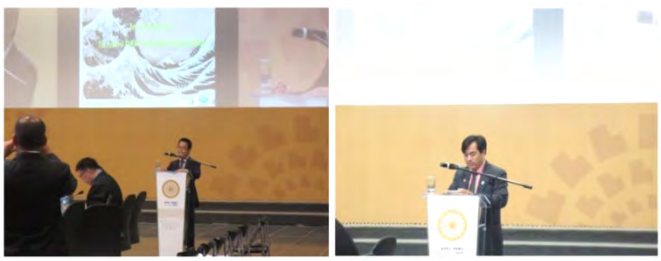


Fig. 2-2-1 Photo on Conference

Session 1: Anti-Tsunami measures by APEC region: Sharing experiences

The first Session, chaired by Mr. Salonga, Office of Civil Defence, Philippines explored tsunami DRR policies including those of Peru, Thailand, Chile, as well as Japan. From Peru, major anti-tsunami measures focusing on non-structural measures taken in Peru were reported by Ms. Gomez Bolivar, INDECI, followed by a presentation on the National Tsunami Warning System in Peru, including Tsunami numerical modelling software and automated software for dissemination by Mr. Vásquez Gianella, Direction of Hydrography and Navigation, DHN.

Mr. Pinta, DDPM, Thailand then shared with the participants the lessons learnt from the Indian Ocean Tsunami, 2004 and tsunami warning system and policy measures established after the disaster. DDPM announced also about another tsunami workshop scheduled in Krabi in September (See 2-2-2.).

Ms. S. Bustos, ONEMI, Chile first summarized the emergency Actions and responsibilities of National Seismological Centre (CSN) and Hydrographic and Oceanographic Service of the Chilean Navy (SHOA) as well as ONEMI and explained about its Integrated System of Forecast and Tsunami Warnings (SIPAT) Developed between 2012- 2015 by Universidad Técnica Federico Santa María and SHOA, which can provide Tsunami estimation based in pre–modelled events in a very short time. The national territory of Chile is divided according its threat level. She also referred to the National Policy for DRM and a guidance framework to develop an integrated DRM across sectoral policies.

ADRC then reported Anti-Tsunami measures defined after the severe experiences of the Great East Japan Earthquake covering both structural and non-structural measures for prevention, preparedness, emergency response, recovery and BBB. At the end of the 1st session, Ms. Morikawa, JICA Perú Office presented anti-Tsunami measures in Asian Pacific region undertaken by JICA.

Fig. 2-2-2 Photo on Conference

Session 2: Collaboration with private sector facing Tsunami Disaster Reduction

The second session was moderated by Dr. Li Weisen, Secretary General, National Science& Technology Center for Disaster Reduction and discussed public-private collaboration based first on the presentation on the NOAA Tsunami Warning System made by Ms. Fischer, Principal APEC Coordinator & Economic Policy Advisor. She briefed also about NOAA tsunami programme including outreach and Education to improve community awareness.

Mrs. R. Grijalba, National Society of Industries, SNI, Perú then talked about SNI activities of the Working group of business support for disaster including works with National Fisheries Association and the efforts in favour of the communities near the coast. Mr. Ninanya, Head of IT Strategy and Mr. Rebolledo, Responsible for the Administration and SST from Toyota, Peru commented on it from the viewpoint of the private sector located in Peru from their experiences.

Major comments and opinion

A roundtable followed by the presentations discussed priorities of anti-tsunami measures raised throughout two sessions. A mega tsunami may bring about significant impacts on Asia Pacific region directly and through supply chain that could affect world economy as well. In order to face mega tsunami, local participation is a key. In Peru, it was pointed out that many people remain living in disaster prone areas unaware of the risks of tsunami. A whole of community approach is important facing tsunami disasters including both local people and non-residents, visitors towards tsunami awareness. Early warning system is another point of discussion that cannot work if people do not respond to the alert. Tsunami DRR is a challenge facing Asia-Pacific region and multi-lateral cooperation is essential to build up efficient early warning systems and to get prepared against mega tsunami which may involve world economy through global value chain.

2-2-3. Community level tsunami DRR "Lessons learnt from the Indian Ocean Tsunami and way forward"

Thailand had never experienced tsunami disaster before the Indian Ocean Tsunami in 2004 that damaged broad areas of Indonesia, India, Sri Lanka, Myanmar, Malaysia, Maldives and so on, as well as Thailand. Many tourists from other countries also lost their lives as well. One hour after the quake, five southern provinces of Thailand including Phuket were hit by the tsunami, which killed more than 5,300 people and more than 3,000 remain missing in Thailand. DDPM, Thailand has made great efforts to establish a comprehensive tsunami warning system in close collaboration with local governments and communities. One day workshop was organized thanks to DDPM, and provinces which were affected by the Indian Ocean Tsunami, aiming at identifying tsunami related policies and challenges at community level emerging after the Indian Ocean Tsunami.

The focus of the workshop was placed on locally based DRR by using new technologies and through collaboration at local level. Effective anti-tsunami measures at local level require close collaboration among diverse local actors including local governments, local commerce and industries and local NGOs as well as national DRR authorities. Inter-regional collaboration among neighbouring provinces and towns is another key.

In the areas favored by tourists from all over the world, DRR policies need to take into consideration of visitors and tourists of multicultural backgrounds. Tsunami disasters may affect vulnerable groups in need of assistance for evacuation. In addition, it relates to all the phases of DRR including prevention, preparedness, early warning, evacuation and other emergency operation, and recovery, rehabilitation and reconstruction. With the above understanding, the main objectives of this workshop was defined to:

1) Identify major challenges facing diverse sectors including local governments, local commerce and diverse industries and NGOs working at community level,
2) Share lessons learnt from previous tsunami disasters
3) Develop new tools that will facilitate tsunami DRR at community level

Outcome of the workshop

The workshop was opened by an inaugural speech delivered by Mr. Supakit Phophapaphan, Deputy Director General, DDPM, Thailand, host country. ADRC made then introductory remarks and continued to present Tsunami DRR in Asia and Japan.

Fig.2-2-3 Tsunami DRR Workshop participants in Krabi

Session 1 : Tsunami DRR Efforts made in Thailand after the Indian Ocean Tsunami

In the first session chaired by Mr. A. Pinta, DDPM, Rear Admiral Song Ekmahachai presented Tsunami Disaster Warning System and Policy in Thailand and Sub-Lieutenant Pongsatorn Sirisakorn, made a presentation on National Tsunami Response Plan & Implementation, representing DDPM.

DDPM Provincial Offices then reported their tsunami response plan & warning system at provincial level. Five provincial offices presented their tsunami DRR policies in individual provinces including Phuket, Phang Nga, Ra Nong and Trang as well as Krabi. From civil society, Thai Red Cross joined the workshop, while Thai Southern Hotel Association reported about the experiences at the Indian Ocean Tsunami and its efforts to hand down the lessons learnt to young generations.

Session 2 : Various efforts against Tsunami from international experiences

The second session first explored policies and countermeasures in Japan and Indonesia. Dr. Natt Leelawat, Tohoku University reported about evaluation of Post-Great East Japan Earthquake tsunami DRR measures in Japan focusing on the activities targeting communities, followed by Dr. Harkunti Rahayu, Institute of Technology, Bandung, ITB , who made a presentation on the evaluation of tsunami DRR policy in Indonesia after Indian Ocean Tsunami. From the private sector, possibilities of using advanced technologies such as mobile phone facilitating integration of DRR information easily, adapted to local tsunami DRR efforts were presented by the participants from Kawada Industries, Inc. and Kawada Techino system co., ltd., Japan

Demonstration and group training of Disaster Imagination Game, DIG

Last session was facilitated by Professor T. Komura, Tokoha University, who made first a presentation on Disaster Imagination Game, DIG, followed by group discussion and training on DIG. By using a map of Krabi area, participants actively discussed community based tsunami DRR measures, in particular, evacuation routes adapted to the area by developing a map together.

Major comments and opinion

A wide range of lessons could be drawn and shared with from the discussion of the one day workshop attended by locally based governmental sector, private sector, and civil sector in tsunami vulnerable areas.Amongst all, experiences as famous coastal resort areas affected by a mega disaster are useful for and to be applied to many other tourist destination areas.

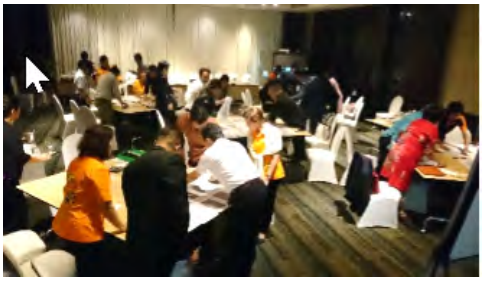


Fig.2-2-4 DIG Activity

Thailand experienced another tsunami on 11 April 2012 after the hardship of 2004. Evacuation from the Tsunami in 2012 was however chaotic despite the policies taken after 2004, due mainly to insufficient information for evacuation targeting tourists, and lack of experiences. Only 50 large hotels took responsibility of evacuation for their guests. Hotel branding in regard to evacuation measures can be an effective measure. In tourist destination areas, training with wide participation of tourists is indispensable as well as those just targeting local residents.

Regarding recovery and reconstruction, it should be noted that in 2004 more than 20% rooms of 900 hotels in Krabi were damaged, although most of the small & middle sized hotels had not been insured.

Another challenge for the affected areas include maintenance of tsunami tower and buoy: How to maintain awareness and continue financing DRR measures against a mega disaster that could happen after an interval of decades or a century.

Finally, it should be noted that in Thailand, those experienced 2004 tsunami have been retired and young generation does not share the hard experiences. Lessons learnt from the past experiences will help us elaborate anti tsunami measures well adapted to individual areas, and high tech today will facilitate upgrading DRR measures.

3. Collection and Dissemination of Disaster Information

ADRC has been disseminating a wide range of information related to disaster risk reduction on its website (http://www.adrc.asia) aiming at ensuring appropriate disaster response, mitigation, and preparedness activities

3-1. DRR Activities of Member Countries

With assistance from its 30 member countries, ADRC has been collecting information on systems, plans, and specific measures of each country's disaster risk reduction as well as the situation of natural disasters. ADRC has also been collecting information from related materials, various countries/organizations and through Visiting Researchers from the ADRC member countries and UNOCHA Office in Kobe.

ADRC will continue collecting and sharing information on the following items mainly:

1) Disaster management systems (legal frameworks, organizations, basic plans, and disaster management manuals),
2) Experiences of disaster response, and 3) Information on natural disasters (descriptions of natural disasters such as earthquakes, floods, cyclones, etc., and resulting damages).

3-1-1. Information Collection from Member Countries

In fiscal year 2016, as in the previous year, ADRC collected disaster risk reduction-related information on member countries through the following methods.

(1) Information provided from ADRC Member Countries

Besides the voluntary provision from the member countries, ADRC collected the information on systems, plans, and specific measures of each country's disaster reduction as well as situations of ongoing natural disasters through Visiting Researchers (VR).

(2) Collecting Information through Participation in International Conferences

ADRC collected relevant information regarding progress of Sendai Framework for Action (SFA) implementation and the latest DRR activities by participating in international conferences such as AMCDRR held in November 2016, IAP meetings, and so on

(3) Utilization of Internet

Taking advantage of internet, ADRC has been collecting disaster related information efficiently. Internet will be more important to facilitate technical support and construct disaster information databases. Internet also helps ADRC to collect related information provided by academic research institutions and international organizations. Recently, ADRC has using Facebook as one of major social network services for providing latest activities of Visiting Researchers.

In fiscal year 2015, ADRC continued gathering information on disaster risk reduction systems of member countries through requesting information, field surveys, international conferences, and internet. Furthermore, ADRC updated country reports in cooperation with Visiting Researchers.

Table 3-1-1 lists the reports provided by counterparts in member countries. All these reports are made available on ADRC website. Over recent years, disaster risk management organizations in many countries have been actively promoting information dissemination on the internet. ADRC website developed direct links to these websites which offer access to the latest information.

Table 3-1-1 List of reports from ADRC member countries

Country	Year prepared
Armenia	2001, 2002, 2003, 2005, 2006, 2010, 2012, 2015, 2016
Azerbaijan	2011, 2014
Bangladesh	1998, 1999, 2001, 2003, 2005, 2006, 2010, 2011, 2013
Bhutan	2008, 2013, 2014
Cambodia	1998, 1999, 2002, 2003, 2005, 2006, 2013
China	1998, 1999, 2005, 2006, 2012
India	1998, 1999, 2002, 2005, 2006, 2008, 2012, 2015
Indonesia	1998, 1999, 2002, 2003, 2004, 2005, 2006, 2012, 2016
Iran	2013
Japan	1998, 1999, 2002, 2005, 2006, 2012
Kazakhstan	1998, 1999, 2002, 2005, 2006
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
Maldives	2013, 2014, 2015
Mongolia	1998, 1999, 2002, 2005, 2010, 2011, 2013
Myanmar	2002, 2005, 2006, 2013
Nepal	1998, 1999, 2005, 2006, 2009, 2010, 2011, 2014
Pakistan	2005, 2006, 2009, 2015, 2016
Papua New Guinea	1998, 1999, 2005, 2006
Philippines	1998, 1999, 2002, 2003, 2005, 2006, 2009, 2010, 2011, 2012, 2014, 2016
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
Tajikistan	1998, 1999, 2003, 2005, 2006
Thailand	1998, 1999, 2003, 2004, 2005, 2006, 2008, 2010, 2011, 2012, 2016
Uzbekistan	1998, 1999, 2005, 2006, 2013, 2015
Vietnam	1998, 1999, 2005, 2006
Yemen	2009, 2012, 2014

Country Reports includes the following topics provided by each member country.

I. Natural Hazards in the Country
   1.1 Natural Hazards Likely to Affect the Country village
   1.2 Recent Major Disasters
   (Basic data of disasters, damage situation, response and recovery information)

II. Disaster Management System
   2.1 Administration System
   2.2 Legal System and Framework
   2.3 Structure of Disaster Management
   2.4 Priorities on Disaster Risk Management

III. Disaster Management Strategy, Policy and Plan

IV. Budget Size on National Level

V. Progress of the Implementation of Hyogo Framework for Action (HFA)

VI. Recent Major Projects on Disaster Risk Reduction

VII. Counterparts of ADRC

3-1-2. Natural Disaster Data Book

(1) Background

Past disaster records are critical data in policy making, review, survey and analysis of disaster management plan. ADRC concluded MOU on disaster data utilization with the Centre for Research on the Epidemiology of Disasters (CRED) and has conducted analyses on disaster impacts based on the database, EM-DAT maintained by CRED. For instance, 20th Century Data Book on Asian Natural Disasters, and its revision released in 2000 and 2002 respectively featured disasters which hit its member countries while annual Natural Disaster Data Book covers disaster characteristics in the world.

ADRC continues to provide basic data on natural disasters and making efforts to facilitate use of data.

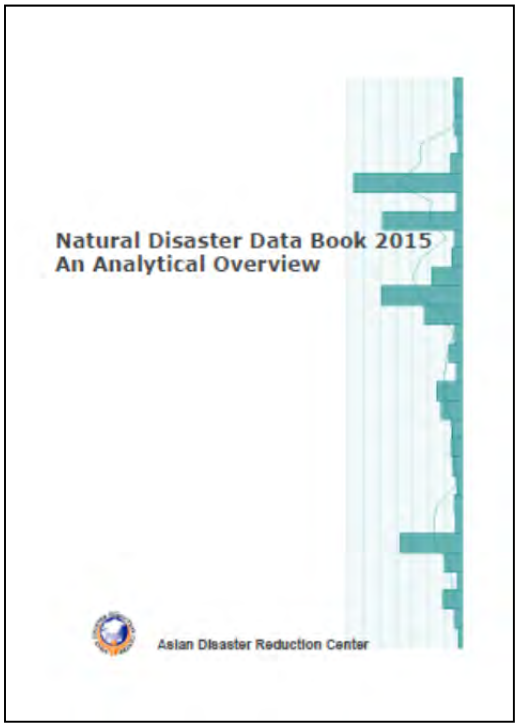
(2) Natural Disaster Data Book 2015

This section presents a summary of Natural Disaster Data Book 2015, which covers regional and disaster-specific issues of the year and long term.

The following Figures 3-1-2 and Tables 3-1-3 depict the results of analyses of national disaster and impacts in 2012 and in the long term.

According to EM-DAT recorded in 2015, 394 disaster events occurred, 23,834 people were killed, more than 110 million people were affected and economic damage reached over 72.7 billion USD.

In year 2015, nearly 9,000 people were killed by the earthquakes that hit Nepal in April and May. In Asia, followed by the above-mentioned earthquakes, heat waves left 2,248 people killed in India and 1,229 people in Pakistan. Also, in France, 3,275 people were killed by heat wave.



By region, Asia had the largest shares in disaster occurrence (44.9 %), killed people (68,7%), affected people (61.4%) and the amount of damages (47.4%) in 2015 as seen in Figure 3-1-2 and Table3-1-1.

By disaster type, different disasters had the highest shared in each index. As for occurrence, flood topped by 40.6% while in the number of people killed, earthquake by 40.1%, the number of affected people, drought by 50.1%, and economic damage, storm by 45.3% (Figure 3-1-2 and Table3-1-1).

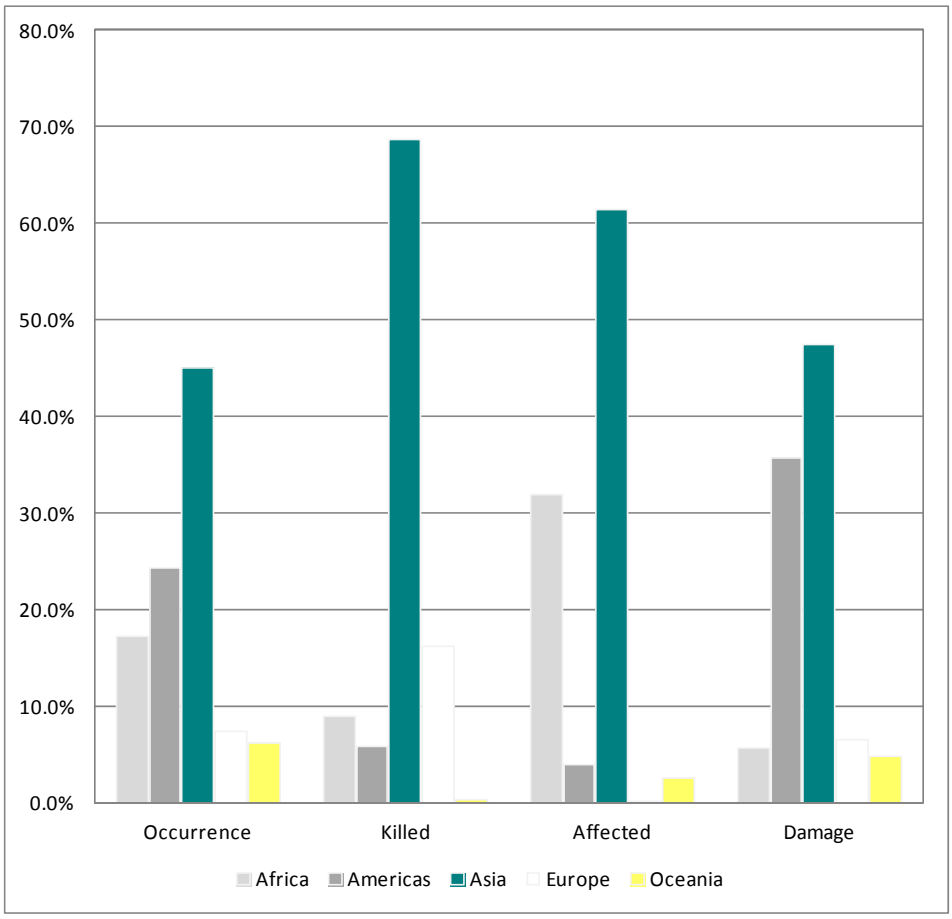


Fig. 3-1-2 Impacts of Natural Disasters by Region 2015

Table 3-1-3 Impacts of Natural Disasters by Region 2015

Region	*Impact*							
	Occurrence (share in %)		Killed (share in %)		Affected (share in %)		Damage (million US$) (share in %)	
Africa	68	(17.3%)	2,132	(8.9%)	35,271,645	(31.8%)	4,062	(5.6%)
Americas	96	(24.4%)	1,407	(5.9%)	4,365,047	(3.9%)	25,984	(35.7%)
Asia	177	(44.9%)	16,373	(68.7%)	68,141,474	(61.4%)	34,493	(47.4%)
Europe	29	(7.4%)	3,856	(16.2%)	224,274	(0.2%)	4,697	(6.5%)
Oceania	24	(6.1%)	66	(0.3%)	2,899,323	(2.6%)	3,523	(4.8%)
Total	394	(100.0%)	23,834	(100.0%)	110,901,763	(100.0%)	72,759	(100.0%)

3-1-3. Disaster Information Sharing Using GLIDE Numbers

GLIDE is the acronym for the GLobal unique disaster IDEntifier system, in which commonly formatted but unique numbers are assigned to disasters all over the world. The GLIDE system was first proposed by ADRC and has been adopted and used by more than 20 international organizations and research institutes.

There are many organizations around the world that design and develop their own disaster databases freely accessible online. When a disaster occurs, information is distributed over the Internet not only by organizations in the affected countries but also by organizations and the mass media in other countries. Whenever a disaster occurs in any part of the world, ADRC collects information from websites of relevant organizations and worldwide news agencies, or by sending e-mails to contact persons in the affected area. Over the course of its experience, ADRC came up against several problems in collecting disaster information using these methods, including the following.

① It requires considerable manpower to search Internet for websites of relevant individual organizations every time a disaster occurs.
② There is no standardized naming protocol for disasters. As many different names are given to a certain single disaster by various organizations, even search engines such as Google or Yahoo sometimes return no results.
③ Website links may be lost, once the structure of particular organization's database or website is modified.

The GLIDE system offers a solution to these problems. It will significantly improve the efficiency with which information on historical and ongoing disasters can be retrieved from databases and websites.

At the Global Disaster Information Network (GDIN) Conference held in Canberra, Australia in March 2001, ADRC proposed to develop a standardized coding system for managing information on disasters around the world. This proposal was accepted and implemented as a pilot project by the GDIN. In 2004, glidenumber.net was jointly developed by ADRC and OCHA ReliefWeb, with technical assistance provided by LaRED. It is designed to issue new GLIDE numbers to disasters immediately after they occur. Moreover, ADRC, the CRED, IRI/Columbia University, the USAID/OFDA, the WMO, IFRC, UNDP, and ISDR Secretariat have agreed to use the GLIDE number format as the standard for assigning disaster identification numbers.

GLIDE numbers issued between 2001 to 2016 amounted to approximately 5200 GLIDE including 180 in 2015 and 140 in 2016.

3-2. Database on DRR

3-2-1. Latest Disaster Information

When a natural disaster occurs, information on the damage situation of the affected area, emergency response and relief is collected and disseminated through media, national and local governments, international organizations, research institutions and civil societies in the affected countries and throughout the world. Such information was once provided largely individually, it took time to get all the necessary information, whch prevented from immediate data collection activities in case of emergency.

Since its inception in 1998, ADRC has developed a database of the latest disaster information obtained from various sources. Summarized information with direct links to the sources enables rapid search and retrieval of information. In particular, the database provides a summary of disasters (dates, locations, and overviews), damage situations, relevant links categorized as reports/articles, geographic data, emergency relief information, urgent reports from ADRC member countries and graphic information. Such information is continually updated on its website.

Figure 3-2-1 to Figure 3-2-4 shows information flow of ADRC website starting from the top page to related information. The earthquake that hit Indonesia in December 2016 is shown as example. In the top page, the disaster appears as the latest disaster, linked to detailed information (Figure 3-2-1). The detailed information has links to the corresponding GLIDE number, space imagery obtained in Sentinel Asia framework, and national disaster management organization of the country, when it is ADRC's member country (Figure 3-2-2 to 3-2-4).

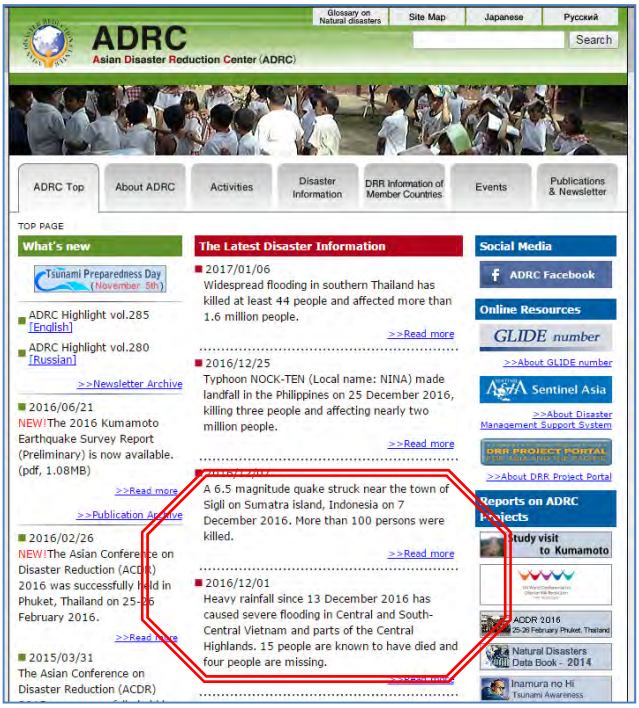


Figure 3-2-1 ADRC website

The information originates mainly from announcements of disaster relevant organizations including those in ADRC member countries, situation reports from the UNOCHA ReliefWeb, International Federation of Red Cross and Red Crescent Societies (IFRC), and media reports. The Latest Disaster Information site is interlinked with the disaster management information of ADRC website, serving as a portal to various kinds of information.

In addition, the database connected to the link to the other site “JAXA DMSS” to enhance the value to ADRC’s web site using the satellite image data taken at the affected site after the natural disasters when the emergency satellite observation was conducted. The database provides information of more than 2,166 disasters in the world as of 27 January 2017.

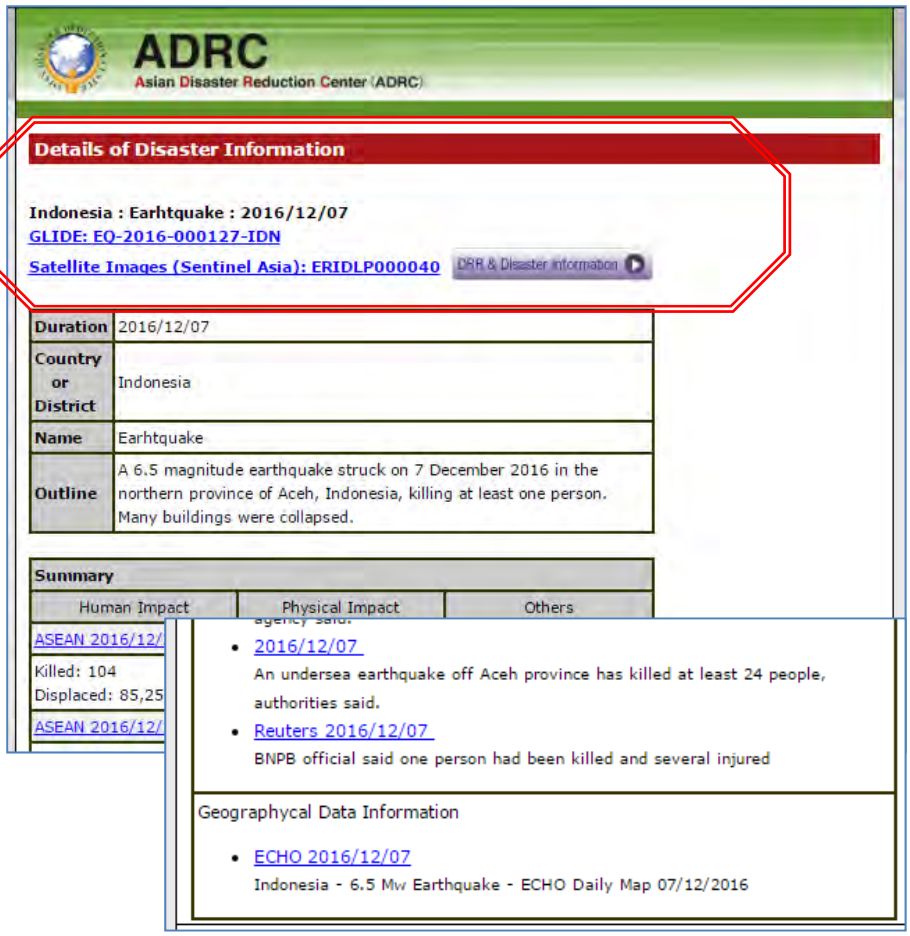


Figure 3-2-2 Latest Disaster Information on the earthquake in Indonesia

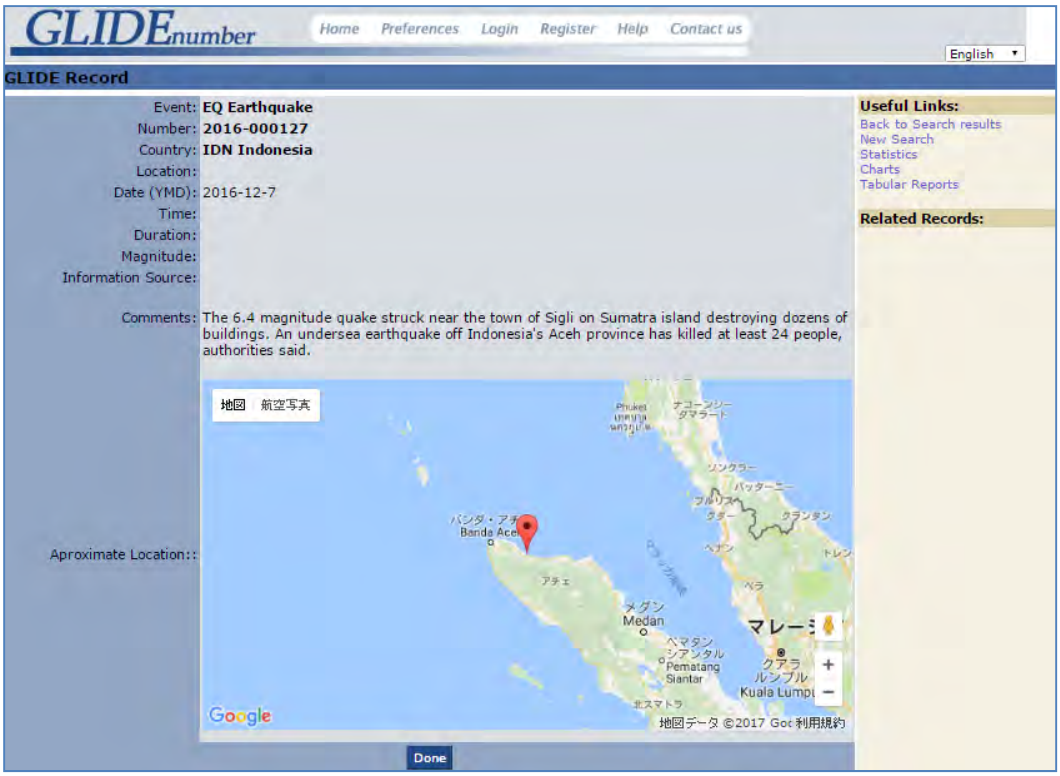


Figure 3-2-3 GLIDE Number of the disaster

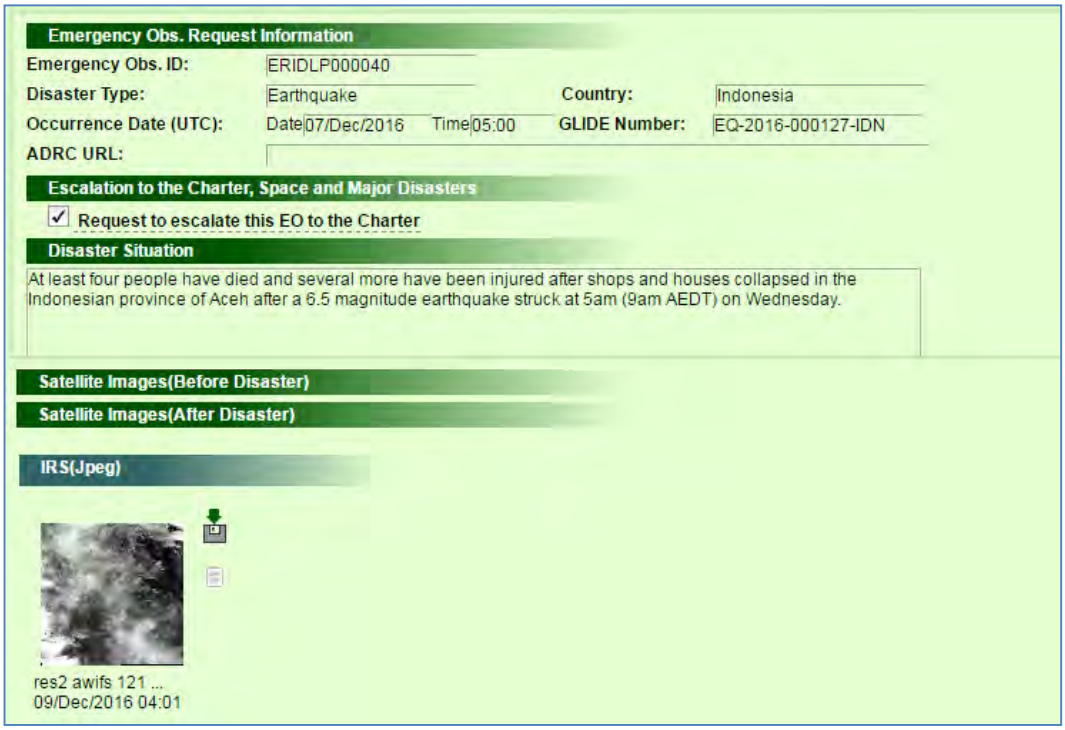


Figure 3-2-4 Satellite imageries of the disaster in Sentinel Asia

3-2-2. Asian Disaster Reduction Center Newsletter : ADRC Highlights

ADRC has been using the Internet and e-mail to share information with its counterparts in the member countries, and other relevant parties. As one of its important tools for information dissemination, ADRC has been issuing the newsletter “ADRC Highlights” since 1 June 1999. It had been issued twice a month until FY 2007, and has been issued once a month since the renewal of its design in FY 2008.

Fig. 3-2-5 ADRC Highlights
(May 2016: Japanese edition, English edition, Russian edition)

The newsletter is made available on the website. It is also e-mailed in English, Russian and Japanese to ADRC counterparts and former visiting researchers, former GLobal IDEntifier number (GLIDE) visiting researchers, participants in the past ADRC annual meetings, visitors to ADRC, trainees in JICA's training courses which ADRC were involved in, and participants in international conferences ADRC took part in to strengthen relations with. Also ADRC registers e-mail addresses of those who wish to subscribe the newsletter upon the receipt of request e-mail. The numbers of subscribers in English, Russian and Japanese, are 2,168, 223 and 903 respectively as of January 2017.

The contents include articles on the latest ADRC activities, reports on international conferences, and other events which ADRC staff attended and gave presentations in, as well as national reports by ADRC visiting researchers from member countries.

Table 3-2-6 Headlines from ADRC Highlights (FY2016)

Vol.	Main Articles
277	✓ Policy Peer Review 2015 for the Nationwide Promotion of the SFDRR in the Philippines
278	✓ ADRC and IRP Participate in Emergency Management and Disaster Recovery Panel in the US ✓ IRP Participates in Pre-Conference Forum of the 2016 ASPA Conference
279	✓ ADRC Participates in the 11th Meeting of the Typhoon Committee Working Group on Disaster Risk Reduction ✓ ADRC Participates in 3rd Earthquake Technology Expo in OSAKA
280	✓ 7th UN-SPIDER Regional Support Offices (RSO) Meeting
281	✓ JICA's Knowledge Co-Creation Program on Comprehensive Disaster ✓ Risk Reduction for Central Asia and the Caucasus 2016
282	✓ Workshops on tsunami disaster risk reduction 1: APEC Workshop on ✓ Tsunami DRR Held August 16 in Lima, Peru
283	✓ ADRC Visiting Researcher Report -Ms. Lorene Sia-Catedral (Philippines) ✓ ADRC Visiting Researcher Report -Ms. Susilastuti (Indonesia) ✓ ADRC Visiting Researcher Report -Ms. Syuzanna Kakoyan (Armenia) ✓ Report from ADRC Internship -Mr. Ataru Nakajima
284	✓ The 6th Annual UN-SPIDER Conference
285	✓ Japan-Singapore Partnership Program for the 21st Century "Disaster Risk Reduction and Management" ✓ 23rd Session of the Asia-Pacific Regional Space Agency Forum (APRSAF-23)
286	✓ Visit by Thailand Vice Minister of Interior ✓ ADRC Visiting Researcher Report -Mr. Akbar Bacha (Pakistan) ✓ ADRC Visiting Researcher Report -Mr. J.M.A.R. Jayarathne (Sri Lanka) ✓ ADRC Visiting Researcher Report -Mr. Sarote Thiprut (Thailand)
287	✓ ADRC Steering Committee meeting in Kumamoto
288	✓ Participation in the 2nd Steering Committee Meeting of Sentinel Asia

3-3. Applying Space-Based Technology and Information and Communication Technology to Strengthen Disaster Resilience

3-3-1. Sentinel Asia

(1) Objective

ADRC continues to participate in the Sentinel Asia project. The project was launched in 2006 with an objective of establishing a disaster risk management system by making the use of satellite images in Asia. ADRC serves as the focal point to receive emergency observation requests from DRR organizations in the framework of the Sentinel Asia. ADRC then examine whether the request is appropriate or not and whether the emergency observation should be implemented mainly for the assessment of damages and casualties or not, and forward the requests to five space agencies, namely, the ISRO (India), the JAXA (Japan), the GISTDA (Thailand), the KARI (Korea), NARL (Taiwan), CRISP (Singapore) participating in the Sentinel Asia Project.

In accordance with the Cooperation Agreement between the United Nations Office for Outer Space Affairs (UNOOSA) and ADRC signed on 4 June 2009 on the establishment of ADRC UN-SPIDER Regional Support Office, ADRC UN-SPIDER Regional Support Office has been established within ADRC premises and operated by ADRC staff members as coordinators of ADRC UN-SPIDER RSO.

ADRC, as a UN-SPIDER RSO, should thus work toward ensuring the successful completion of the UN-SPIDER Work Plan thereby facilitating countries in Asia to have access to and develop the capacity to use space-based information to support the full disaster management cycle.

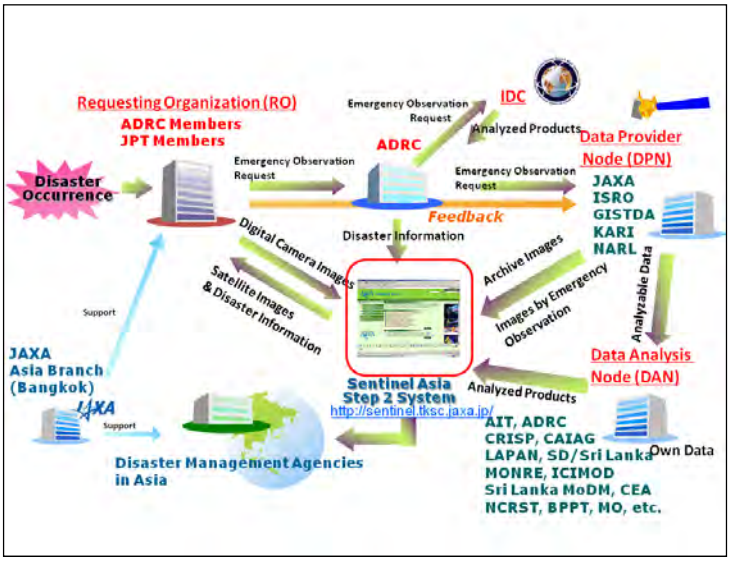


Fig. 3-3-1 Flow of emergency observation

(2) Implementation of Sentinel Asia Step3

A step-by-step approach for the implementation of Sentinel Asia was adopted as follows:

Step1: Implementation of the backbone Sentinel Asia data dissemination system

Step2: Expansion of the dissemination backbone with new satellite communication systems

Step3: Establishment of a comprehensive disaster management support system

At APRSAF-19 (Asia-Pacific Regional Space Agency Forum, APRSAF) held in Kuala Lumpur in December 2012, successful completion of Sentinel Asia Step2 was declared. Sentinel Asia Step3 has the following concept, based on experiences in Step2 and user requirements.

- A basic continuation of Step2 activities
- Expansion from response (in Step1 and Step2) to cover the mitigation/preparedness and recovery phases in the disaster management cycle (Fig. 3-3-1)
- Participation of various satellites: earth observation satellites, communication satellites, and navigation satellites
- Further collaboration for operation
- Further utilization of human networking through capacity building and outreach

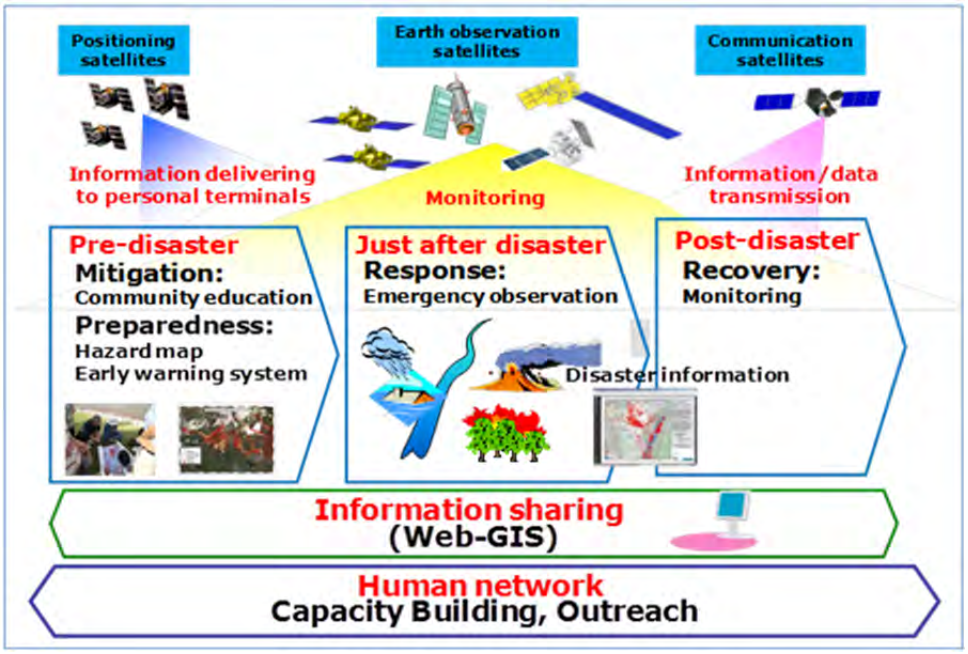


Fig. 3-3-2 Concept of Sentinel Asia Step3

(3) Emergency Observation Activities for this year

Despite the year to year changes in the number of requests, the ratio of activated numbers remains stable at around 80%. After a peak of 2010-2011, however, the number of requests reduced after ALOS, a laser sensor had stopped in May 2011, which might had affected the number of requests. From January to December 2015, twenty-five emergency observations were requested, twenty-four of which were undertaken, after the operation of ALOS-2, the succeeding satellite of ALOS had started from November, 2014.

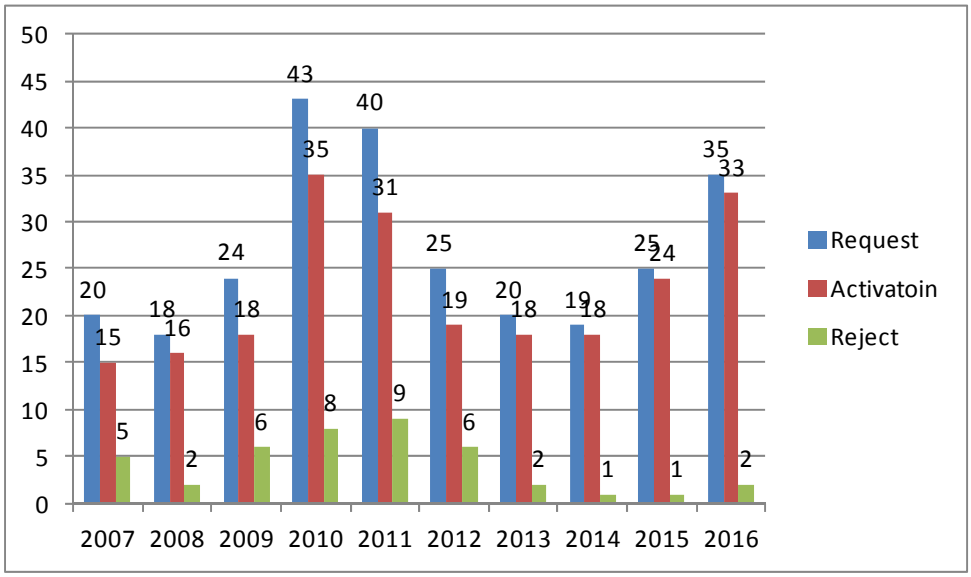


Fig. 3-3-3 Changes in the number of emergency observation 2007-2016

Looking at the breakdown of type of disaster in 2016, the ratio of flood occupies for more than one third of the total (Fig. 3-3-).

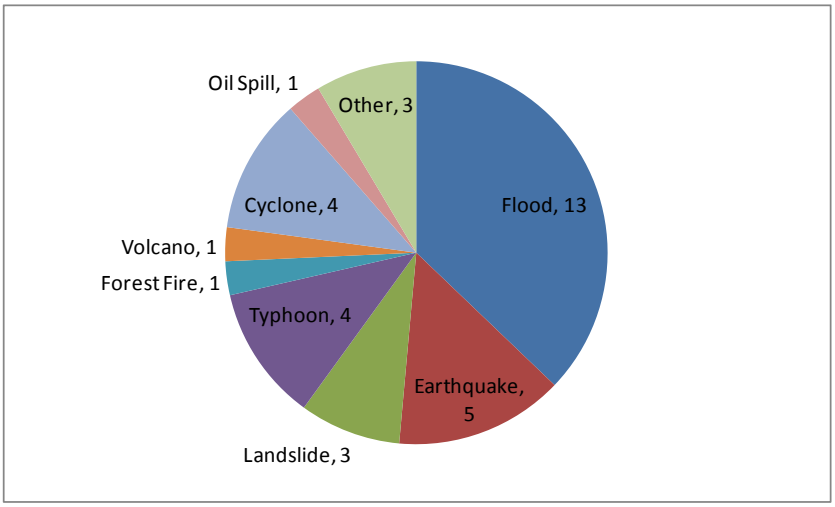


Fig. 3-3-4 Breakdown by type of disaster (2016)

3-3-2. Sentinel Asia activities for DRR

(1) Sentinel Asia Step 3 and ADRC

Sentinel Asia STEP 3 has started since 2013 based on expanding human networks and joint operation coordinated by Joint Project Team of SA, and been employing a wide variety of satellites including earth observation satellites, communication satellites and navigation satellites. The activities have covered all phases of disaster management cycle including not just emergency response but pre-disaster prevention and preparedness phases as well as post-disaster recovery and reconstruction phases.

ADRC has got support from JAXA and carried out the following tasks to lead SA STEP3 evolution, supporting of establishment and management of steering committee and working groups, emphasizing utilization of satellite images for the disaster management organizations participating in SA.

(2) Contents

Major activities performed by ADRC for Sentinel Asia STEP3 include:

1. Collaboration for establishing the Steering Committee for work as the secretariat for SC together with JAXA
   - 1.1 Preparatory coordination for establishing SC
   - 1.2 Support for day to day organization of SC as the secretariat
   - 1.3 Document and report preparation for the meetings
2. Collaboration for promotion of SA step 3
   - 2.1 Coordination for intensifying cooperation with the disaster management organization
   - 2.2 Support for WG organization of such as disaster classification WG
3. Report in the meetings

(3) Progress

ADRC has supported steering committee and WG meetings for SA, mainly hosted by JAXA. About supporting promotion of SA STEP3, ADRC undertook a questionnaire survey and hearing survey targeting disaster management organizations on the following issue.

- ✓ Organizational structure of disaster management organizations in the governments of member countries
- ✓ Department/division requiring satellite images including contact details
- ✓ Working Groups of their interest
- ✓ Contact points in case of disasters, including those of local offices, if any

The outcome of this survey has been made accessible on the web of JAXA.

3-3-3. Applying Space-Based Technology and Information and Communication Technology to Strengthen Disaster Resilience

(1) Background and Objectives

Asian Development Bank (ADB) has initiated a regional capacity development technical assistance on Application of Satellite Based Technology (SBT) and Internet and Communication Technology (ICT) at local government and community levels in a more cost-effective manner. This project aims to support Armenia, Bangladesh, Fiji and the Philippines by improving local capacity to collect reliable and timely disaster-related data facilitating post-disaster response, recovery and reconstruction efforts, leading to strengthening disaster resilience of the target country/region. ADRC has joined this project as CBDRM Specialist.

(2) Overall methodology

Community based hazard map on paper provides diverse local information, which can be easily shared by digitalization. Electric map facilitates also sharing micro-regional information rapidly in case of disaster. In addition, by overlaying the satellite imagery, disaster history in the area and overall disaster images can be easily shared with, facilitating rapid and effective disaster response.

The overall approach and methodology (See Figure 3-3-5) includes:

i) community-based OSM base map development;

ii) community based hazard/risk and evacuation routes mapping;

iii) crisis mapping;

iv) utilization of satellite -based damage assessment;

v) data management using GIS at local governments; and

vi) utilization of data at the community level for disaster risk reduction, response and recovery.

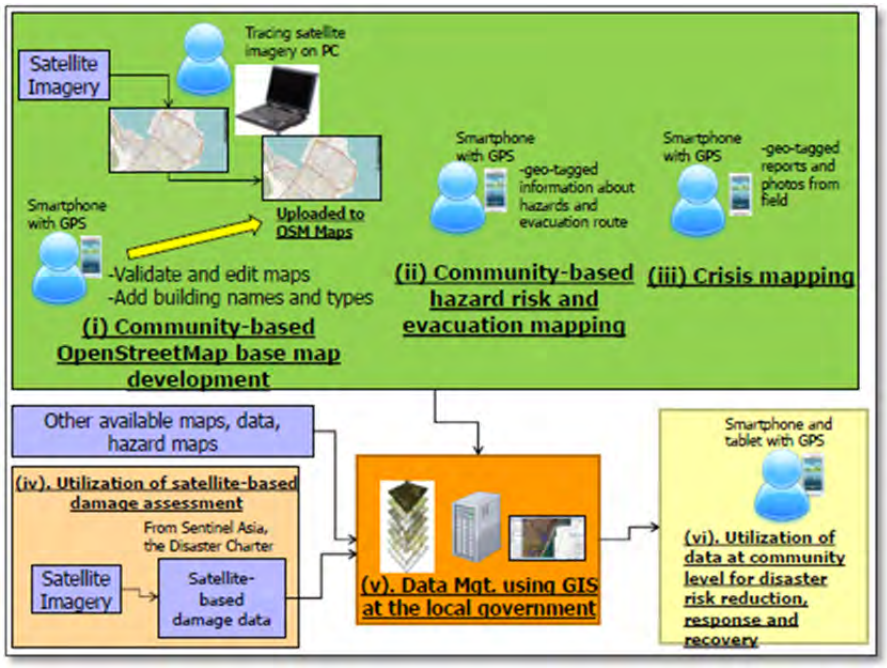


Fig. 3-3-5. Overall methodology

(3) Project period

The project period is from October 2015 to July 2017.

In December 2015,the regional kick-off meeting with the governmental officials of four pilot project countries (Armenia, Bangladesh, Fiji, and Philippines) was held at AIT, Thailand. Throughout 2016, map data and other relevant data were prepared and town-watching training were organized in each country. The software that was developed also during 2016, has been used for the town-watching and drill from the beginning of 2017. The applications will be completed by the end of May 2017, and made available for the relevant local authorities so that they will be able to get prepared to face future disasters.

(4) Activities at regional and in four pilot project countries

1) Regional kick off meetings

The regional kick off meeting in AIT stated with a side event, the OSM (Open Street Map) workshop to inform the participants the OSM concept, how to use the application, and good practices. International and national consultants participated in it.

Delegates from pilot project countries also participated in the regional kick-off meeting. After the briefing of the project by ADB, collaborators contributing the project including AIT, ADRC, RESTEC, PASCO, GeoThings reported the status of each pilot project countries as well as the project targets.

2) Kick-off Meeting and other activities in the pilot project countries

Each pilot project country conducted the kick-off meeting, OSM mapping workshop, Town-Watching workshop, Evacuation drill, Policy making meeting, and the Final meeting.

Additional workshops are scheduled during April to July 2017 in each pilot project country.

(5) Further Contribution to member countries

The application developed as an outcome of this project could be applied to other member countries in the future and expected to contribute to strengthen DRR at the community level in each member country.

4. Human Resource Development

4-1. Human Resource Development and Information Networking on Visiting Researcher (VR)

4-1-1. Background

ADRC has been receiving Visiting Researchers (VR) from member countries since 1999. To date, 96 officials from 26 member countries took part in this program.

Every visiting researcher has learnt about Japan's advanced knowledge and technology on disaster risk reduction and international cooperation made by Japan during his/her stay in ADRC.

The Visiting Researchers are expected not only to contribute to strengthen capacity on disaster risk reduction in their countries, but also to further promote cooperation between their countries and ADRC. After finishing the program, they are expected to contribute to developing and improving the capacity on DRR in their countries.

4-1-2. Objective

The objectives are as follows:

- To evaluate the capacity of ADRC member countries under the Sendai Framework for Disaster Risk Reduction by accumulating the latest data on the organizations, the national budget, the national plans, disaster event database, and the relevant laws, act, and regulations for disaster risk management.
- To examine the policies through collecting and analyzing disaster risk reduction measures of member countries.
- To improve the Visiting Researcher program based on their advice such as usefulness of sharing information and exchange opinions among the visiting researchers who stayed in the same period.

4-1-3. Activities of Visiting Researchers in FY2016

In FY 2016, the following six researchers joined the program; three researchers in the first half year from Armenia, Indonesia and the Philippines; and three researchers in the latter half year from Pakistan, Sri Lanka and Thailand.

4-1-3-1. Armenia

Name: Ms. Syuzanna Kakoyan

Job Title at the time of visit: Leading Specialist of Department of Sociology and Psychology, Western Survey for Seismic Protection, Ministry of Emergency Situation

She had the intention to research on disaster education and human resource development. She gathered information on disaster education at school and awareness to analyze comparative study between Armenia and Japan and made recommendation to Armenia.

4-1-3-2. Indonesia

Name: Ms. Susilastuti

Job Title at the time of visit: Disaster Management Facilitator in Directorate of Preparedness, National Disaster Management Authority (BNPB)

She had the intention to study on lesson learned of psychosocial issues and disaster preparedness of earthquake and tsunami. She took lectures on research on psychosocial studies in Japan which widely started after the Great Hanshin Awaji Earthquake. Through taking lectures and visits by experts at national level and Hyogo prefecture, she considered applicability to her country.

4-1-3-3. Philippines

Name: Ms. Lorene Sia Catedral

Job Title at the time of visit : Civil Defense Officer III, Office of Civil Defense Caraga Regional Office (OCD)

She had the intention to study about factors contributing to the high resiliency and adaptive capacity of Japan to natural disasters. Through lectures and visits at central and local governments and lectures to conduct comparative study in Philippines and Japan and she consider applicability of effective system and cases to Philippines.

4-1-3-4. Pakistan

Name: Mr. Akbar Bacha

Job Title at the time of visit: Assistant Director, National Disaster Management Authority (NDMA)

He has the intention to research about role and needs for education and awareness in disaster risk management in Pakistan. He is taking lectures from relevant DRR organizations, local governments, and educational facilities to examine the situation of disaster education and roles of different stakeholders and to make recommendation to Pakistan.

4-1-3-5. Sri Lanka

Name: Mr. Jayarathne Jeewandara Mudiyanselage Aruna Ravindra

Job Title at the time of visit: Assistant Director (Early Warning), Disaster Management Center, Ministry of Disaster Management

He has the intention to analyze the effectiveness of Early Warning to tsunamis in Galle District-Sri Lanka. By taking lectures from Japan Meteorological Agency, local governments and research institutes and visits to monitoring sites, he will gain understanding of Early Warning system in Japan and consider applicability to Sri Lanka.

4-1-3-6. Thailand

Name: Mr. Sarote Thiprut

Job Title at the time of visit: Civil Engineer, Practitioner Level, Department of Disaster Prevention and Mitigation (DDPM), Ministry of Interior

He plans to conduct a comparative study on the prevention and reduction of risks of disasters in Japan and Thailand. For this, he will take lectures at DRR organizations, local governments and academia to conduct comparative survey on various approaches in disaster management.

Scenes from presentations and visit of VRs, Visit to an elementary school in Hiroshima Prefecture to learn disaster education by local government and school, Cabinet Office, final research presentation and participation in DRR events targeting communities in order to learn various methods for awareness-raising (clockwise from left above)

4-2. Seminars and Training Course

4-2-1. JICA Knowledge Co-Creation Program: “Comprehensive Disaster Risk Reduction for Central Asia and Caucasus”

ADRC conducted a Training Course, “the Knowledge Co-Creation Program for Disaster Management Officials from Central Asia and the Caucasus” from 27 June to 29 July 2016. This event was organised in cooperation with the Japan International Cooperation Agency (JICA) Kansai International Center. Central Asia and the Caucasus frequently experience disasters such as earthquakes and landslides, as well as flash floods and other floods caused by spring snow melts in the mountains. In addition, some of these natural disasters extend across several countries. Promoting regional cooperation on disaster risk reduction in these regions is therefore a significant challenge.

Fig. 4-2-1 Explanation about landslides of Chuetsu Earthquake.

This course aims to convey basic knowledge and experience related to natural disaster management in the participants’ countries. Participants were asked to identify a major problem in their own country and to formulate an action plan for addressing it.

The course was conducted in Russian for 14 central and local government officials representing six countries: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan in Central Asia, and Armenia in the Caucasus. Participants attended lectures and visited central and local government agencies, research institutes, private companies, a meteorological organization, and NGOs in order to comprehensively enhance their understanding of disaster management.

Following in the footsteps of last year’s participants, they visited the city of Hiroshima and learned about the importance of passing down lessons learned from major disasters to future generations. In addition, they learned about the experience and lessons from the 2014 Hiroshima landslide and visited the construction site of an erosion control dam being built as one of the structural countermeasures.

Further, during their Tohoku study tour, they learned about the complex disaster caused by Tsunami and Nuclear accident under the Great East Japan Earthquake. They learned about the disaster, evacuation, and reconstruction while visiting Kawauchi village in Fukushima prefecture.

During their Niigata study tour, they visited the area affected by the Chuetsu Earthquake and learned about earthquake recovery and the landslide and erosion control countermeasures being implemented. In addition, thanks to the cooperation of the Niigata prefectural government and the Snow and Ice Research Center of the National Research Institute for Earth Science and Disaster Prevention, they learned about countermeasures implemented by the Niigata prefectural government for heavy snow regions, and learned a great deal about snow and ice disasters.

It is hoped that the participants will make good use of the knowledge, tools, and methods they

learned during this training course to implement various projects and help strengthen the disaster management systems in their home countries. ADRC would like to express its sincerest gratitude to all the organizations that contributed to the success of this course.

4-2-2. JICA Knowledge Co-Creation Program: "Comprehensive Disaster Risk Management"

4-2-2-1. Comprehensive Disaster Risk Management (A)

From 10 January to 24 February 2017, ADRC, in collaboration with JICA, conducted the JICA Comprehensive Disaster Risk Reduction (A) course for 14 countries, namely Afghanistan, Argentina, Bhutan, Colombia, Indonesia, Liberia, Macedonia, Malaysia, Mongolia, Myanmar, Nepal, Pakistan, Sri Lanka, and Vietnam.

15 participants were mostly government officials in charge of DRR, including academic researchers, geographical engineers and rescue staffs. Those who have various backgrounds and expertise took part in the 7-week training course.

This course aimed to contribute to formulate and further develop disaster management activities and plans in participating countries by enhancing their understanding of Japanese disaster management systems and countermeasures of central/local government and multi-stakeholders.

Fig. 4-2-2 Community-based hazard mapping

The training provides a various contents, for instance, the lectures of Japanese disaster management policy, activities implemented by communities or private sectors, and case studies of past disasters in Japan. Therefore, participants comprehensively understood DRR efforts of Japan.

Furthermore, we introduced some practical workshops for DRR to make a community-based hazard map, and conducted observatory tours to the affected area of big earthquakes, volcanic eruptions and water induced disasters.

4-2-2-2. Comprehensive Disaster Risk Management (C)

Comprehensive Disaster Risk Management (C) course was conducted in collaboration with JICA, for 7 central and local government officials of Brazil in Portuguese language, from 2 October to 5 November 2016.

Natural disasters especially flood and land slide frequently occur in Brazil claiming human lives and huge economic loss.

Fig. 4-2-3 Lecture at Hyogo Disaster Management Center

This course shared the knowledge and

experiences in Japan including prompt actions against flood and landslide, at different levels: from central/local government to the community. Participants had a lot of lectures on current situations in Japan, especially on the good practice of the coordination between the Local Meteorological Office and the Prefectural Government for the effective early warning and evacuation.

They were strongly impressed with DRR efforts in Japan and learnt through exchange their perspectives among the participants. These implications were adapted into their action plan, and it is hoped that they will make good use of what they experienced during this course to develop and strengthen DRR capacity in their home country.

4-2-3. JICA Knowledge Co-Creation Program: "Raising Awareness of Disaster Reduction"

This program was conducted for 18 disaster reduction personnel from the following 17 countries, Armenia, Antigua and Barbuda, India, Egypt, Sri Lanka, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Saint Lucia, Solomon Islands, Chile, Vanuatu, Vietnam, Honduras, Marshall Islands, Malaysia, Myanmar, Mongolia by English from 9 January to 11 February 2017.

Particularly, they joined to the opinion exchange meeting with the residents of Nobiru area affected by the Great East Japan Earthquake and tsunami in 2011 at Oku-Matsushima Hostel in Miyagi Prefecture. They were able to listen about serious experiences of evacuation and rescue by the tsunami at that time. Since most of participants were from archipelagos, this meeting became a good opportunity to re-recognize the fear of Tsunami. Further all of them highly appreciated this meeting because the efforts and ingenuities of residents in Nobiru district on group relocation for disaster prevention and substitute of residential land was one of the good examples of "Build Back Better" .

Fig. 4-2-4 Lecture in Higashimatsushima City Government

The participants were very interested in the efforts of disaster reduction in Japan and eagerly participated every lecture and observation and finally made presentation of action plan for own country. ADRC would like to express its sincerest gratitude to all the organizations that contributed to the success of this course.

4-2-4. Japan-Singapore Partnership Program for the 21st Century "Disaster Risk Reduction and Management"

ADRC conducted the Japan-Singapore Partnership Program for the 21st Century "Disaster Risk Reduction and Management" for disaster management officials in ASEAN countries from 27 November to 9 December 2016. This event was conducted in cooperation with the JICA and the Ministry of Foreign Affairs of Singapore.

The Japan-Singapore Partnership Programme for the 21st Century (JSPP21) was established in May 1997 to signify a widening of the scope of technical cooperation between Singapore and Japan with the intention of enhancing ASEAN integration and sharing the two countries' experience in their areas of expertise. Priority is placed on training and capacity building for officials who are in charge of disaster management. This year marked the first time for the training course to be held in Japan. The course was conducted for 16 central and local government officials representing seven countries: Cambodia, Fiji, Indonesia, Lao PDR, Myanmar, Philippines, and Vietnam.

Participants attended lectures and visited central and local government agencies, research institutes, and NGOs to comprehensively enhance their understanding of disaster management. For instance, staff members of the Singapore Civil Defence Force had a two-day lesson on disaster management in urban areas. This lesson focused on emergency response, firefighting activities, and training for capacity building. In addition, participants also visited Minami Sankiru town, one of the areas devastated by the Great East Japan Earthquake. There they learned about "Recovery in Industry" from the Tourist Agency of Minami-Sanriku Town.

Fig. 4-2-5 Lecture by Singapore Civil Defence Force

It is hoped that the participants will make good use of the knowledge, tools, and methods they learned during this training course to implement various projects and help strengthen the disaster management systems in their home countries. ADRC would like to express its sincerest gratitude to all the organizations that contributed to the success of this course.

4-3. Short-term Training and visitors

ADRC has been conducting a short-term training for the disaster risk reduction. targeting mainly government officials and students overseas. The training courses are focused on the current status of disaster in Asia, activities of ADRC and the disaster prevention measures in Japan, and so on. The training activity is a good opportunity to deepen their understanding of the efforts and awareness about the significance of disaster prevention activities, to improve the disaster prevention capability in Asian countries.In recent year, participants were particularly interested in town-watching program.

The following table is the list of visitors from abroad who attended lectures in FY 2016 and high level delegation.

Table 4-3-1 Short-term Training in FY 2016

	Date	Affiliation	Number	Country
1	17 April 2016	Survey Department in Sri Lanka	15	Sri Lanka
2	19 April 2016	Building Research Institute	4	Ecuador, Nicaragua, Philippine
3	25 October 2016	JICA Training (Brazil)	2	Brazil
4	29 November 2016	Delegation from Jiangsu Province, China	7	China
5	25 January 2017	Delegation from Thailand	7	Thailand
	13-14 March 2017	Delegation from MARD, Vietnam	4	Vietnam
	Total		39	

5. Promoting Cooperation with Member Countries, International Organizations and NGOs

5-1. Urban Search and Rescue Training in Singapore

Asia is one of the most disaster-prone regions in the world. Natural disasters that have occurred in Asia in recent years have been the most severe, prolonged and widespread ever experienced in the region. Moreover, the regional vulnerability tends to increase due to the rapid urbanization, the insufficient speed in building an infrastructure capable of coping with urbanization, the coupling of independent risk sources (interaction of natural hazards with chemical, technological, lifestyle, and social risks), and the insufficient management capacity.

The Singaporean government holds an annual training course for search and rescue officers, and over the past nine years. The course was attended also by oversea participants outside Singapore. The Course provids diverse training to improve search-and-rescue expertise required to face urban disaster situations. The training facility complex of the Civil Defence Academy (CDA) of the Singapore Civil Defence Force (SCDF) is one of the most advanced facilities in Asia. In an effort to utilize their expertise and facilities,

ADRC has invited fire fighters and rescuers from member countries to participate in this training course since FY 2001. Following table is the list of participants in past. The number of participants reached 54 in total.

Table 5-1-1 List of Participants

Fiscal Year	Countries of past participants	Number of participants
2001	Philippines, Myanmar, and Korea	3
2002	Cambodia, Laos, Mongolia, Philippines, and Vietnam	5
2003	Cambodia, Malaysia(2), Myanmar, Sri Lanka, Thailand(2), and Philippines(2)	9
2004	Armenia, China, Nepal, Philippines	4
2005	Korea, Pakistan, Papua New Guinea, Russia	4
2006	Laos, Malaysia(2), Pakistan, Philippines(2), Papua New Guinea, and Vietnam	8
2007	Bangladesh, Korea, Nepal, Philippines	4
2008	Bhutan, Thailand, Kazakhstan, Mongolia	4
2009	Armenia, Sri Lanka	2
2010	Bhutan, Mongolia, Maldives	3
2011	Bangladesh, Russia	2
2012	Thailand, Mongolia	2
2013 (2014)	Maldives, Bhutan	2
2015	Azerbaijan	1
2016	Mongolia	1
Total		54

5-2. Capacity Building in Member Countries

5-2-1. Technical Cooperation Project in Nepal

5-2-1-1. Background of the Project

Nepal is located in the area of collision between the Indian plate and the Eurasian plate, which has been hit by earthquakes frequently. Kathmandu Valley, where the capital city of Nepal is located , has experienced several disastrous earthquakes, including the Bihar-Nepal earthquake of magnitude 8.4 which occurred in 1934, leading to collapse of approximately 20% of all buildings in Kathmandu Valley and 9,040 fatalities.

Despite the high risk of a future earthquake in Kathmandu Valley, countermeasures such as retrofitting of buildings for seismic resistance, land use control and application of the National Building Code have not been sufficiently promoted so far . Further, due to the rapid increase of population of Kathmandu Valley, increasing number of population could face the risks caused by extensions work on existing buildings and non-engineered buildings that constructed without the participation of knowledgeable and skilled architects and engineers.

With this background, it has become an urgent need to update the risk assessment for the future development plans and raise policies concern on the disaster risk management. Under the request from the government of Nepal, JICA formulated the “Project for Assessment of Earthquake Disaster Risk for the Kathmandu Valley” and decided to start the project activities from the end of April 2015 and ADRC contributed to it.

On April 25, 2015, just before the commencement of the project, the Gorkha earthquake of Mw7.8 (USGS) occurred at the boundary of the Indian Plate and the Eurasian Plate with its epicenter approximately 76km west of Kathmandu. This earthquake brought heavy damages in a wide range of area; more than 8,600 people were killed and approximately 500,000 buildings were totally destroyed(See 5-2-2-1). Through a series of discussions with counterparts, the project component was partly modified in order to adapt to the post-earthquake situation and respond to the rehabilitation and recovery needs.

5-2-1-2. Outline of the Project

The outline of the project is as shown in the below table.

【Project Period】	April 2015 – October 2016 (Term 1) October 2016 – April 2018 (Term 2) (Total 3 years)
【Project Goal】	To implement the earthquake risk assessment for future scenario earthquakes with considering the earthquake environment after the Gorkha Earthquake, and to develop the DM plan for concrete and effective promotion on disaster risk management for future earthquakes.
【Project Target Areas】	Kathmandu Valley
【Expected Outputs】	[Output 1]: To conduct seismic hazard analysis based on scenario earthquakes utilizing the latest knowledge and create detailed ground model for Kathmandu Valley. [Output 2]: To conduct seismic risk assessment based on the results of seismic hazard analysis (Output1), and summarize as damage estimation by considering several occurrence scenes (time, date, season, etc.) [Output 3]: To enhance skills for updating risk assessment results in accordance with the social environment change in the future. [Output 4]: To formulate BBB recovery and reconstruction plan utilizing the results of hazard analysis, and disaster management plan based on the results of seismic risk assessment for the pilot municipalities.

In the fiscal year 2016, as one of the activities on "Standard Operation Procedure (SOP) Planning", the existing SOPs in Nepal were reviewed. Then, using the result of the chronological survey on the emergency response activities of the disaster management organizations at national level and in the pilot municipalities in the case of the Gorkha Earthquake, the first version of the SOP for municipality level was drafted. Also, as the activities on the "Community Based Disaster Risk Management(CBDRRM)", a 3-day CBDRRM training for the municipality officers in pilot areas was organized. After the training, pilot activities for the CBDRRM in the pilot communities were discussed and coordinated among the stakeholders.

Fig. 5-2-1 First Version of the SOP for Municipalities

Fig. 5-2-2 CBDRRM Training for Municipality Officers

(Source: JICA Project for Assessment of Earthquake Disaster Risk for the Kathmandu Valley in Nepal)

5-2-2. Project on Rehabilitation and Recovery from Nepal Earthquake

5-2-2-1. Background of the Project

On 25th April 2015, a magnitude 7.8 earthquake occurred and its epicenter was in the Gorkha District which is approximately 77km northwest of Kathmandu, the capital city of Nepal. Due to several aftershocks, devastating damage was recorded. The total number of deaths was 8,631, the number of injuries was 16,808; there were 500,000 totally collapsed houses and approximately 270,000 partially collapsed houses. The Nepali government estimated the total economic damage caused by the earthquake was approximately 10 billion dollars (GDP of Nepal in 2012-2013 was 19.2 billion dollars). In addition, the Asian Development Bank (ADB) estimated the real GDP growth of Nepal in 2014-2-15 would be 3.8 % which was underestimated by 0.8 % as a result of the earthquake. It is expected the earthquake has caused a serious negative impact to the economy of Nepal.

According to the assessments by the United Nations (UN) and the Nepali government, fourteen Districts which were designated as heavily affected areas consisted of 20% of the population of Nepal. Meanwhile, deceased and injured persons and heavily affected public facilities and individual housing consisted of more than 90% of the total population and buildings. Moreover, approximately more than 3,300 landslides occurred including those on the Tibet side, and the landslide damaged a large number of roads and bridges, which is a hindrance of rehabilitation and reconstruction.

Under these conditions, JICA dispatched a fact finding mission to Nepal from 26th of April to conduct a needs assessment related to rehabilitation and reconstruction and to develop the contents of urgent projects. On 25th of May, the Nepal government and JICA jointly conducted a seminar in Kathmandu to introduce the Japanese experience of reconstructions from earthquakes, formulation of reconstruction plans, and examples of reconstruction projects. In this seminar, JICA emphasized the importance of formulating more disaster-resilient national reconstruction plans which reflected the concept of Build Back Better. This concept indicated that the timing before the rehabilitation and reconstruction phase is the opportunity to develop a more resilient society than the pre-disaster phase, which was based on “Sendai Framework for Disaster Risk Reduction 2015-2030” adopted by the Third United Nations World Conference on Disaster Risk Reduction held in Sendai in March 2015, and “Sendai Cooperation Initiative for Disaster Risk Reduction” stated by the Japanese government. Many participants from the Nepal side appreciated the ideas.

5-2-2-2. Outline of the Project

The outline of the survey is as shown in the below table.

【Survey Period】	July 2015 – March 2019
【Survey Goal】	To comprehensively support the process of early rehabilitation and reconstruction of the affected areas and the formulation of a disaster resilient nation and society by referring to the experience and lessons learnt of the disasters and reconstruction in Japan.
【Target Areas】	Damaged area: Gorkha, Sindhupalchok Capital: Kathmandu area
【Basic Policy of the Survey】	1) Formulation of national level and district level plans 2) Promotion and dissemination of seismic resistant buildings and structures 3) Formulation of prioritized reconstruction project (Program grant aid) 4) Formulation and implementation of Quick Impact Projects (QIPs)

ADRC has dispatched the experts on "Community Based Disaster Risk Management(CBDRM)" to conduct the CBDRM workshops for Disaster Risk Reduction (DRR) awareness and establishment of Early Warning Systems (EWS) at areas of high risk of landslide. Followings are example of activities at local.

Landslides are one of the most familiar natural disaster in Nepal, because many Nepali live at slope areas with terraced field. It means Nepali people are living with risk of landslides. However, there are no Landslide EWS in Nepal. Therefore, to protect lives at high risk communities, community awareness and community based disaster risk reduction are necessary. JICA project team held a DRR seminar at Kerabari village, Syaule, Sindhupalchok in collaboration with Department of Water Induced Disaster Prevention: DWIDP, with participation of more than 50 villagers including the village leader and school teacher. Kerabari villagers have lost some friends and families caused by a big landslide at the Nepal earthquake on 25th April 2015.

Fig. 5-2-3.DRR workshop at local community

After that, a settlement affected by the landslide moved to safer places within the village by their own judgment. And the landslides experts from Japan highly recommended establishing EWS including monitoring systems at the top of the hill to catch the signal of future landslides. Participants learnt the basic knowledge of landslides, and set a simplified rain gauge, an angle meter, and an extension meter. Participants deepened their understanding of self-evacuation and alerting the local government in case of abnormal value based on self-monitoring. It was a pilot case of the DRR education at community level, therefore JICA project team hopes that the seminar and contents will be revised and formulated as a sustainable activity in Nepal in collaboration with landslide experts and other related organizations of EWS.

5-2-3. Data Collection Survey of Disaster Protection and Prevention in Mongolia

5-2-3-1. Background of the Survey

In Mongolia, especially in the western part, occurrence of the several large-scale earthquakes of magnitude 8.0 or the similar scale has been recorded in the earthquake chronology. Recently three active faults were discovered in the suburbs of Ulaanbaatar (UB) city, capital of Mongolia, and also the number of both unfelt and felt earthquakes in UB city has increased. These situations raise concerns about the increased risk of earthquake in Mongolia.

Under such circumstance, JICA extended the cooperation for the Emergency Management Department of the Capital City (EMDC) through "The Project for Strengthening the Capacity of Seismic Disaster Risk Management in Ulaanbaatar City" from February 2012 to October 2013 and provided the following support: 1) drawing up the comprehensive earthquake risk map, 2) reviewing the Earthquake Disaster Prevention Plan and giving a proposal for its revision, 3) Drawing up the Guidelines for Seismic Resistance of Mid-to-high-rise Buildings, and 4) cultivation of human resources for DRR.

In the light of the consequence of the technical cooperation, in 2013, the National Emergency Management Agency (NEMA) of the central government of Mongolia requested to the Government of Japan to provide aid for the following technical cooperation project. Since the contents of the request were wide-ranging, JICA conducted a field survey in February 2014. The survey concluded need for the improvement of legal system, human resource development, public awareness and information sharing for quality control of building construction as issues of priority in the field of improvement of seismic resistant construction.

While more than two years passed since the above request was made by the NEMA, the government of Mongolia accelerated various their-own efforts for disaster risk reduction. Also, in March 2015, the third UN World Conference on DRR was organized and the Sendai Framework for DRR 2015-2030 was adopted in the Conference. Consequently, it was needed to reconsider the support strategy to Mongolia in line with the global movement based on the Sendai Framework and by reviewing the requests not only on seismic resistant construction measures, but also on overall earthquake DRR measures. Against this background, "Data Collection Survey of Disaster Protection and Prevention in Mongolia" was conducted for reviewing and analyzing the latest information on DRR measures and efforts.

5-2-3-2. Outline of the Survey

The outline of the survey is as shown in the below table.

【Survey Period】	February – November 2016
【Survey Goal】	To review current situation and issues for earthquake disaster risk reduction measures in Mongolia. To reexamine the request from the government of Mongolia and propose support strategy by JICA for serving the consideration of the next project.
【Target Areas】	Whole of Mongolia (Research Base: UB city)
【Basic Policy of the Survey】	1) To analyze issues and challenges for earthquake DRR measures from the comprehensive perspective 2) To consider contents for technical cooperation for demonstrating and maximum utilizing leading technology in Japan 3) To propose support contents in line with the Sendai Framework for DRR and based on the current situation of Mongolia
【Items of the Field Survey】	• Past earthquake history and damage situation • Earthquake occurrence probability and damage estimation • Earthquake observation and early warning • Earthquake risk map • Law, regulation, policy, DRR plan • Disaster management system and social capitals • Disaster information • Emergency response system • Information collection on the situation of mainstreaming of DRR • Seismic protection construction standards and construction administration • DRR education • Project related to Urban Master Plan in UB city • On-going and past DRR-related projects of other donors, possibility of collaboration, duplication with the requested activities

ADRC dispatched the expert on “DRR Education” in this survey to review and analyze current situation and issues to be addressed in the field of DRR education in Mongolia. Also, based on the survey result, priority activities to be conducted in the next project were proposed.

Fig. 5-2-4 Observation Visit to the Public DRR Training Center under Construction

Fig. 5-2-5 Interview Survey in Emergency Management Department in UB City (EMDC)

(Source: JICA Data Collection Survey of Disaster Protection and Prevention in Mongolia)

5-2-4. Technical Cooperation Project in Mongolia

5-2-4-1. Background of the Project

In 2013, the National Emergency Management Agency（NEMA）of the central government of Mongolia requested the Government of Japan to provide aid for the technical cooperation project aiming to promote disaster management abilities related to earthquakes in Mongolia. JICA conducted the Data Collection Survey of Disaster Protection and Prevention in Mongolia (refer to the section 5-2-3) from February 2016, and collected relevant information. Through the survey, JICA coordinated opinions with the Mongolian government and modified the contents of the request above to the ones focusing on strengthening the ability of NEMA. Then, in May 2016, the modified request was finally adopted by the government of Japan. Subsequently, JICA dispatched the Detailed Planning Study Team, and according to the result of the study, JICA and NEMA agreed on the details of the Project named "The Project for Strengthening the National Capacity of Earthquake Disaster Protection and Prevention in Mongolia", and started the project activities from November 2016.

5-2-4-2. Outline of the Project

【Project Period】	November 2016 – January 2020 (3 years)
【Project Goal】	The capacity of the National Emergency Management Agency will be enhanced through the activities for strengthening the countermeasures for seismic risk.
【Expected Outputs】	Output 1: Capacity for data collection on disaster risk reduction and coordination among related organizations will be enhanced. Output 2: Capacity of public administration officer related to the seismic assessment and seismic strengthening of buildings will be enhanced. Output 3: Implementing a plan on disaster risk reduction education and awareness raising activities will be developed and realized.

ADRC dispatched the expert for taking the leadership of the overall activities to achieve above mentioned "Output 3" in this project. Also, the following activities related to the School DRR are the main responsibilities of the ADRC;

- Development of Guideline for DRR Education in Pre-School, Elementary School, And Junior High School,
- Development of Educational Materials for DRR Education in Pre-School, Primary School, and Junior High School,
- Implementation of Training Program for Teacher Instructors, and
- Indirect Support for Implementation of Training Program for Teachers and School Staff Members

In the fiscal year 2016, as an initial activity, Japanese School DRR Education guideline was introduced, and the survey on current situation of DRR contents in the school education in

Mongolia was initiated. Further, the training program for the project counterpart persons was organized in Japan in March 2017 for learning Japan's DRR efforts, including School DRR education.

Fig. 5-2-6 Introduction of DRR-related Contents in Japanese School Texts

Fig. 5-2-7 Training in Japan: Field Visit to Disaster Reduction and Human Renovation Institute (DRI)

(Source: Project for Strengthening the National Capacity of Earthquake Disaster Protection and Prevention in Mongolia)

5-3. Promoting Cooperation with Member Countries, International Organizations and NGOs

ADRC places high priority on the development of institutional and human networks to share disaster information in Asia. Developing networks between professionals and their counterparts in member countries, adviser countries, and observer organizations is vital to promoting cooperation on disaster reduction efforts in Asia. Therefore, ADRC invites high level and management level officials, including deputy directors, directors, and managers, to its annual ADRC International meeting to encourage interpersonal exchanges.

(1) Pre-Disaster Recovery Planning Orientation Workshop

Upon request of the Manila Observatory, and in collaboration with the SM Prime Property Company and the Philippine Disaster Resilience Foundation (PDRF), the International Recovery Platform/Asian Disaster Reduction Center (IRP/ADRC) facilitated an orientation workshop on pre-disaster recovery planning (PDRP), 29 April 2016 at the Asian Institute of Management, Makati City, Philippines. The event gathered about 90 recovery decision-makers, planners, and implementers from public and private sectors, including civil society, scientific community, academe, media, and representatives of local communities to learn the essence of pre-disaster recovery planning. The composition of participants was diverse to effectively simulate the PDRP exercise and to facilitate complementarity of recovery support functions.

The workshop explored various approaches of formulating a PDRP based on existing tools and experiences, including strategies, actions, and case studies from global experiences and highlighting Japan's pre-disaster recovery agreements as observed during the recovery from the Great Hanshin-Awaji Earthquake 1995, the Great East Japan Earthquake 2011, and the Kumamoto Earthquake 2016. The importance of the PDRP was emphasized by prominent speakers, namely: Ms. Antonia Loyzaga of the Manila Observatory, Ms. Liza Silerio of the SM Prime, Mr. Guillermo Luz of the PDRF, Gen. Alexander Pama of the Office of Civil Defense, and Ms. Remedios Endencia of the National Economic Development Authority (NEDA). The speakers generally recognized that PDRP is essential because all governments and communities face similar organizational and policy issues in a disaster recovery (e.g. governance, financial management, effective operations, redevelopment standards, infrastructure, transportation, health, and livelihoods), so it pays to plan in advance. Firstly, it increases the "speed" of recovery when all stakeholders (i.e. multi-sectoral, multi-disciplinary, and inter-ministerial/departmental) plan in advance. It facilitates coordinated planning and implementation that minimizes uncertainties, overlaps, and bottlenecks. Secondly, it builds stronger relationship among all stakeholders that limits poor decision taken under post-disaster stress. It prepares stakeholders' full participation in recovery - making it easy to engage and reach a risk-informed decision. Finally, it establishes beforehand the modalities for financing recovery process, including pre-agreements and contracting services.

Using the Metro Manila earthquake scenario shared by Dr. Renato Solidum of the Philippine

Institute of Volcanology and Seismology (Phivolcs), the workshop came up with two main outputs. One was a Checklist for Pre-Disaster Recovery Planning and the other was a Template on Pre-Agreement for Disaster Recovery. As way forward, the participants agreed to scale up discussions on PDRP with National Disaster Risk Reduction Management Council (NDRRMC) and explore the options for pre-agreements in disaster recovery, rehabilitation, and reconstruction.

Fig. 5-3-1 Workshop

(2) Build-Back-Better through Pre-Disaster Recovery Planning: An Orientation Workshop

The academic network comprising the Universiti Utara Malaysia (UUM), the Universiti Teknologi Malaysia (UTM), the Universiti Teknologi Mara (UiTM), the Universiti Tenaga Nasional (UNITEN), the Universiti Sains Malaysia (USM), and the Universiti Sains Islam Malaysia (USIM) requested the orientation-workshop to: (i) gain greater understanding of build-back-better through pre-disaster recovery planning for flood as well as the possibility of integrating this concept in the academic courses; (ii) enhance the capacities of faculty members to train other lecturers, students, and practitioners on build back better through pre-disaster recovery planning, and (iii) explore the application of PDRP to achieve a more effective flood management.

About 35 academic professors, lecturers, and officials from the National Government participated the workshop - including representation from all members of the academic network, the Malaysia Civil Defence Department (JPAM), the Ministry of Education (KPM), Fire and Rescue Department (JBP), District of Kemaman, and Mercy Malaysia. Two keynote speeches were delivered to set the tone of the workshop. The first speech was delivered by Mr. Rosman Roslan, District of Officer of Kemaman, Terengganu, highlighting the district's initiative on pre-disaster recovery planning for flood. In particular, the district officer described how Kemaman facilitated the pre-arrangements with hotels and hospitals in case of floods. The second speech was delivered by Mr. Saiful Effendi of the Ministry of Education, where he described the proposed guidelines on disaster risk reduction for public schools. The group exercises of participants came up with two outputs. One was a checklist for pre-disaster recovery planning for Malaysia and the other was a set of strategies and actions for livelihoods recovery.

As for the next steps, the participants agreed to continue the discussions, either physically or virtually. Among the recommended follow-up actions were: (i) documentation of Kemaman flood recovery case and share the report to IRP/ADRC; (ii) review the IRP/ADRC materials on pre-disaster recovery planning and proposed possible module/syllabus for inclusion in academic

course; and (iii) production of knowledge products on disaster recovery for flood, including handbooks designed for practitioners and policymakers. The academic network for flood management research in Malaysia is closely working with the Majlis Keselamatan Negara (National Security Council), the Meteorological Department and Department of Irrigation and Drainage (DID), the Kemaman Land and District Office, and the Ministry of Higher Education.

(3) The 11th Meeting of Typhoon Committee Working Group on Disaster Risk Reduction

ADRC participated in the 11th Meeting of Typhoon Committee (TC) Working Group on Disaster Risk Reduction (WGDRR) which was jointly organized by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), the World Meteorological Organization (WMO) TC Secretariat and the National Disaster Management Research Institute (NDMI) of the Republic of Korea in Ulsan on 24-27 May 2016.

The meeting was attended by 40 persons including representatives of China, Malaysia, Vietnam, Laos, Hong Kong and Macao Special Administrative Regions of China, as well as advisors of the Working Group of Meteorology (WGM) and the Working Group of Hydrology(WGH); and was held four days as follows;

First day: 24th May

Keynote presentations were delivered by the TC secretariat and the experts from WMO and UNESCAP, who have served as advisors for many years on the ongoing implementation (SSOP-II) of Synergized Standard Operating Procedure (SSOP) for Coastal Multi-Hazard Early Warning System and the Strategic Plans of TC, followed by discussion.

Second day: 25th May

Two parallel meetings took place; a country report meeting by the member countries of TC, and another meeting of Advisory Working Group (AWG) by advisors of WMO, UNESCAP, WGM and WGH. In the country report meeting, participant countries presented the reports on recent disasters that occurred in each country, and the initiatives to build disaster information system that facilitates information collection, reporting and provision. ADRC made a presentation about recent disasters in Japan by focusing on the efforts in Hyogo prefecture on the evacuation warning of sediment disaster caused by typhoon and heavy rain. ADRC reported also about the Asian Conference on Disaster Reduction 2016, and basic information of the Kumamoto Earthquake that had occurred in April 2016.

Third day: 26th May

In the morning, Chair, NDMI first briefed about reconsideration of 7 Key Result Areas (KRAs), and explained the future Annual Operating Plans (AOPs) and its budget in WGDRR based on the recognition that DRR is the Cross-Cutting Issue, followed by discussion. In the afternoon, a site visit was organized and conference participants visited a shipyard and an automobile manufacturing plant of the Hyundai Group based in this venue, Ulsan, which is carrying on business worldwide.

Fourth day: 27th May

TC Secretariat summarized this WGDRR and participants agreed to continue discussion intensively on the reconsideration of AOPs, and so on, preparing for the Integrated Workshop, which will be held in the Philippines in October 2016.

(4) The 7th UN-SPIDER Regional Support Offices (RSO) Meeting

In accordance with the cooperation agreement between the United Nations Office for Outer Space Affairs (UNOOSA) and ADRC signed on June 2009 on the establishment of the ADRC UN-SPIDER Regional Support Office (RSO), said RSO has been established on the ADRC premises and is being operated by ADRC staff members as coordinators of the ADRC UN-SPIDER RSO. There are currently 20 regional support offices worldwide.

In its capacity as an RSO, ADRC participated in the 7th UN Platform for Space-based Information for Disaster Management and Emergency Response RSO Meeting, which was held in conjunction with the UN-SPIDER+10 Anniversary Conference. Held from 6 June, the meeting was attended by more than 20 participants from RSOs around the world. During the meeting, the following topics were discussed:

1. Reports on activities of each RSO in 2015
2. Planning activities of each RSO in 2016
3. Discussion of the implementation of TAM recommendations
4. Regional breakout groups: work planning 2016-17
5. Feedback from breakout groups
6. Collaboration for the ongoing implementation of knowledge management

Fig. 5-3-2 Conference

At this meeting, ADRC gave a presentation on its 2015 activities and accomplishments as well as its plans for 2016, and discussed many ideas with the secretariat and other RSOs.

(5) APEC Emergency Preparedness Working Group and other relevant meetings

APEC emergency preparedness working grope meeting was held during August 15-16, in Lima, Peru and ED of ADRC attended it as one of the co-chairs. The second meeting of EPWG of the year 2016 hosted by Peru discussed first, preparation of the upcoming SDMOF meeting scheduled on 8th and 9th October in Iquitos. EPWG elaborated the main theme of SDMOF, which will highlight food security by focusing on emergency meal delivery, public-private collaboration towards increasing resilience, and so on.

EPWG also discussed the draft Action Plan based on the APEC Disaster Reduction Framework endorsed last year by APEC leaders. Many of the economies reported also about

recent disasters and DRR policy development including Indonesia, Vietnam, China, USA, Russia, Chinese Taipei, Philippines, Korea, Thailand, and so on. ADRC briefed about the damages by the earthquakes in Kumamoto in April and the status of recovery.

It also reported about a new proposal of project on infrastructure development at reconstruction and BBB stage in rural area by Vietnam and Japan.

After the Day 2 of EPWG meeting, on August 16th in the afternoon, ADRC in collaboration with INDECI, Peru, organized an APEC workshop on Tsunami Disaster Reduction, supported by Cabinet Office, Japan. USA, Vietnam, Chile, Philippines, Chinese Taipei as well as Peru and Japan joined and discussed a wide range of tsunami DRR policies, challenges and transborder effects through supply chain. Private sector in Peru and JICA also provided inputs on their tsunami DRR efforts. APEC covering majority of tsunami affected areas is one of the best fora to explore tsunami DRR in close collaboration with the private sector, since a huge tsunami could bring about significant indirect damages on the world economy through global value chain, while a tsunami of significant magnitude could physically affect many economies directly, as did the 2004 Indian Ocean Tsunami. Further collaboration bridging both sides of the Pacific should be pursued based on the outcomes.

On 17th and 18th August, FEMA,USA held an APEC workshop on appropriate donation and ADRC attended it on 17th .On 18th and 19th, meetings of APEC Chief Science Advisors and Equivalents, CSAE took place and raised the theme of "Science advice in and around emergencies" on the 1st day. The recommendation by CSAE to APEC leaders and senior officials suggests importance of appropriate scientific advisory input as a core part of economy's disaster preparedness and response systems.

1) The 10TH APEC Senior Disaster Management Officials Forum, held 8-9 October Iquitos, Peru

The 10th APEC Senior Disaster Management Officials Forum (SDMOF) was held in Iquitos, Peru on 8th and 9th, October 2016. As one of the co-chairs of EPWG, ED of ADRC attended the meetings and the APEC Workshop organized by FEMA on Strengthening Public Alert and Early Warning Capacity on 6th and 7th October, prior to the SDMOF.

The 10th SDMOF, hosted by INDIECI Peru was opened by National Institute of Civil Defense, the Honorable Mr. Alberto Manuel Lozada Frias, Head of National Institute of Civil Defense (INDECI), and Mrs. Adela Esmeralda Jimenez, Provincial Municipality of Maynas.

The meeting focused on "Emergency Preparedness for Supply Chain and Emergency Food Security" as the theme and explored the issue of food delivery targeting, in particular, at the poor in emergency, effective public-private collaboration for this purpose, and policy challenges throughout four sessions.

The forum was attended by senior disaster management officials and delegates of Australia, China, Japan, Peru, Philippines, Chinese Taipei, United States and Viet Nam as well as representatives from ABAC（APEC Business Advisory Council） and other relevant organizations.

From Japan, Mr.Yasuyuki Ishii, Policy Advisor, Disaster Management Bureau Cabinet Office, made a presentation on the experience of Kumamoto earthquakes in April 2016 by highlighting the support initiated by the national government targeting at the disaster affected local governments facing difficulties in immediately procuring the necessary supplies by themselves and arranging the transportation.

Participants of SDMOF welcomed the draft Action Plan that EPWG had been discussing, as instructed by APEC Leaders in 2015 as guidance for implementation of the APEC Disaster Risk Reduction Framework (DRRF) .The Action Plan, as a living document, will be discussed and updated as needed.

(6) The 6th Annual UN-SPIDER Conference

The 6th Annual UN-SPIDER Conference, jointly organized by the United Nations Office for Outer Space Affairs (UNOOSA) and the Ministry of Civil Affairs of the People's Republic of China, was held in Beijing on 19-21 September 2016. The event gathered about 130 participants, including representatives of Space Agencies and Disaster Management Organizations from 35 countries, who visited relevant organizations as part of the three-day program.

First Day: 19th September

Mr. Benjie Yin (Deputy Director, General Office of China National Commission on Disaster Reduction) delivered the opening remarks. Ms. Mei Chai (Deputy Director-General, Department of International Cooperation, Ministry of Civil Affairs) served as moderator; and Dr. Shirish Ravan (Secretary-General, UN-SPIDER Beijing Office) provided an overview of sessions to be covered in the three-day program.

The sessions of the first day were "Building on UN-SPIDER 10 Years' Achievements" and "Risk Assessment and Mapping Using Earth Observation Data". There was a presentation prior to each of these topics' discussions. In second session for instance, the value of radar sensing on satellite technology was highly evaluated, and the accuracy of drought prediction was discussed, which needs to be improved through observation and data accumulation.

Second Day: 20th September

The morning sessions of the second day were "Access to Data and Information for Risk Assessment" and "National Spatial Data Infrastructure and Data Framework to Support Disaster Management". These sessions highlighted the contribution of satellite data for flood and drought monitoring and prediction. Hence, the initiatives such as "GAOFEN", with series of high resolution earth observation satellite system in China was introduced, In the afternoon, three breakout sessions were organized, namely: "Monitoring indicators against the global targets of the Sendai Framework", "Procedural guidelines for sharing space-based information during emergency response", and "Crowd-source Mapping for risk assessment

and emergency response". ADRC representative participated in the second breakout session, and reported the importance of proactive participation in learning events and capacity building enhancement in each country to facilitate sharing of space-based information.

Third Day: 21th September

The morning session of the third day was about "Networking and Engagement with the UN-SPIDER Network", where Offices (RSOs) reports from Regional Support, including ADRC, as well as country reports were presented. In the afternoon, two separate site visits were organized - one group visiting the National Disaster Reduction Center of China (NDRCC) and the other group visiting the Yungang Satellite Earth Station.

(7) The 11th Integrated Workshop of Typhoon Committee

ADRC participated in the 11th Integrated Workshop of Typhoon Committee (TC) which was jointly organized by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), World Meteorological Organization (WMO) TC Secretariat in collaboration with the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) and the Local Organizing Committee of Cebu at Waterfront Cebu Hotel on October 24-26, 2016.

ADRC attended the workshop during its Breakout Session on Disaster Risk Reduction in the second day and presented the member's report in the morning and discussed on the progress of the Annual Operation Plan (AOP) by the Working Group on Disaster Risk Reduction (WGDRR) as well as its initiatives and budgets towards the following year.

The member's report covered the disaster overview focusing on typhoons in 2016, the progress of projects related Typhoon Committee and the initiatives on Disaster Reduction by 10 member-countries including the People's Republic of China, the Democratic People's Republic of Korea, the Hong Kong Special Administrative Region of China, Japan, the Lao People's Democratic Republic, Malaysia, the Kingdom of Thailand, the Republic of Korea, the United States of America and the Socialist Republic of Vietnam.

ADRC explained the characteristics of typhoons that landed Japan this year and reported on the enormous damage these had brought to areas that have not frequently been hit by typhoon such as Kanto, Tohoku regions and Hokkaido from the Pacific side. Further, the need to accumulate the contents of these disasters' characteristics and damages as the analyzable dataset was suggested.

During the consultation about the AOP in the afternoon, a useful report was made regarding the 4th project of the year 2016 entitled, "Benefit Evaluation of Typhoon Disaster Prevention and Preparedness" of which China has become the implementing country. In the report, a Chinese Representative stressed that reducing typhoon track forecast error could lead to a reduction of considerable economic losses.

Although the stay was quite brief, the flow of the activities was unbelievably smooth and the travel was comfortable thanks to the support by the Local Organizing Committee. Finally,

ADRC would like to express its sincere appreciation for everyone's effort which contributed to the success of this conference.

(8) Thematic event on "Partnerships and Innovations for improving Disaster Loss Accounting" and a session on "Build Back Better"during the Asian Ministerial Conference on Disaster Risk Reduction" at the 7th AMCDRR

ADRC participated in AMCDRR held in Delhi during November 3-5th and the pre-conference held on 2nd Nov. The Conference was opened by the Prime Minister Modi, India and attended by almost 60 countries.

1) Thematic event on "Partnerships and Innovations for improving Disaster Loss Accounting"

ADRC co-organised a thematic event “Partnerships and Innovations for improving Disaster Loss Accounting”. Mr. S. Jegillos, Senior Advisor, UNDP Bangkok Regional Hub made an opening remark on the purpose of the event, and Professor Yuichi Ono, Tohoku University reported first about the Global Centre for Disaster Statistics, followed by a presentation on the use of drone for DRR by Ms. C. Briggert, Head of Stakeholder Relations, DJI, a report on innovation regarding DRR by the government of Maldives, and a presentation on disaster losses estimation focusing on that of private sector by Mr. A. Perwaiz, Head, Disaster Risk Management Systems, Asian Disaster Preparedness Centre (ADPC).

Fig. 5-3-3 Thematic event“Partnerships and Innovations for improving Disaster Loss Accounting”

ADRC contributed to the event by the presentation titled “GLIDE, GLobal unique disaster IDEntifier number to Support Evidence Based Disaster Reduction Strategy at National & Local Levels -A Simple but Innovative Tool for Effective Disaster Information Sharing-“,delivered by Dr.S. Nishikawa, former Executive Director of ADRC. Mr. Nishikawa raised the extensive potential u contribution of GLIDE as basic tool to facilitate disaster information sharing at national and sub-national DRR organizations towards upgrading DRR activities including those against mega disasters beyond national borders. Many questions on the use of GLIDE were raised from the floor and after the event. In addition to the useful comments on GLIDE, AMCDRR provided us throughout the Conference period diverse opportunities of exchange with our counterparts from ADRC member countries, which has facilitated us reshaping GLIDE and redefining other activities more adapted to the future needs of Asia.

*As the outcome of the AMCDRR, the New Delhi Declaration was endorsed, and an “*Asia

Regional Plan for Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030"s was agreed as one of the main outcome documents. Prior to AMCDRR, a Special Session dedicated to the tsunami DRR was organized by UNISDR, while a commemoration event of the World Tsunami Awareness Day took place on 5th November at the Closing Ceremony. During the special session, many speakers referred to the good practices of Inamurano-hi, on which ADRC published brochures in more than 10 languages.
(http://www.adrc.asia/publications/inamura/top.html)

2) Thematic session on "Build Back Better"

The International Recovery Platform, where ADRC is pioneering member, coordinated a thematic session at the Asian Ministerial Conference on Disaster Risk Reduction, 3-5 November 2016 in New Delhi, India. The session was entitled "Strategies and Actions on Build Back Better" held on 4 November 2016, 13:00-14:30. Six high-level speakers of the session shared their respective experiences and lessons relative to: (i) policies and strategies, (ii) institutional arrangements, (iii) financing mechanisms, and (iv) implementation arrangements and recovery management - the key elements relevant to build back better. About 150 individuals participated in the session, where each speaker outlined key strategies and actions for build back better ranging from the areas of governance, gender, pre-investment, social inclusion, and sustainable development.

After active discussions, Mr. Stefan Kohler of UNOPS and chair of the session offered the summary. First, recovery phase is an opportunity to build back better, which is essential to reduce vulnerability and make the development gains more sustainable. It can be more successful of done with inclusion of the weak and marginalized. Second, pre-investment is an important element for build back better to ensure development continuity, such as promoting risk-informed land use planning. Third, awareness, knowledge, and capacity such as in reference to gender and marginalized groups are essential in facilitating effective preparation to build back better in recovery, rehabilitation, and reconstruction Finally, build back better in recovery is a large-scale institutional and technical effort, which requires all the stakeholders--government, civil societies, and private sector --to collaborate and work together such as the whole-of-government approach of the Philippines.

(9) The Regional Forum on Post-Disaster Recovery

During the "Regional Knowledge Forum on Risk-informed Land Use Planning in the Context of Post-Disaster Recovery", which was organized by the Asian Development Bank (ADB) on 17-18 November 2016 in Manila, the IRP Secretariat was invited to send one recovery expert to share global experiences. The forum was attended by over 100 decision-makers and specialists with expertise in land use management, disaster risk management, and post-disaster recovery. The key speakers were from Canada, Indonesia, Japan, Myanmar, New Zealand, the Philippines, and Thailand who discussed how disaster risk related issues can be addressed through land use/spatial planning in the context of post-disaster

recovery.

The forum recognized that large-scale disasters often result in changing spatial structures due to corresponding large-scale reconstruction activities. Hence, the recovery process that follows provide opportunities to address both the pre-existing spatial development related challenges as well as the new ones. Some actions that may be introduced to address the issues associated with land use and housing in the post-disaster phase, may include: (i) introducing new land use strategies; (ii) regulating and providing incentives to rebuild away from hazard-prone areas; (iii) proposing new spatial growth models that factor in changing hazard patterns; (iv) addressing issues related to land title and rights; (v) adopting participatory approaches towards rebuilding thereby improving social cohesion; and (vi) undertaking a combination of structural and nonstructural investments to manage future disaster risk.

The forum covered three thematic sessions, where key messages and recommended actions were presented. The first session dealt with recovery policies, wherein policy actions may be focused on addressing the challenges related to the availability of land, risk information, local capacity, finances, and in meeting the speed required to implement activities on the ground. The second session dealt with the horizontal and vertical coordination issues, especially between national and local governments. The suggestion that came up from this session was to revisit and address the underlying causes of disaster risk. Adoption of a system-wide approach (such as focusing on watersheds) and design recovery measures that strengthens vertical and horizontal linkages may help contribute in addressing the issue. The final session dealt with good practices and innovative tools. It is in this session that IRP shared some of the international experiences. The recommendations from IRP included: reviewing past disaster experiences by specifically performing "failure analysis" and "build back better"; selecting from "menu of options" of strategies and actions from global experiences to address recovery issues and challenges - including land use and housing issues; and conducting pre-disaster recovery planning (pre-event research, pre-agreements) to help hasten the effectiveness of land use planning in post-disaster context (i.e. strengthening institutional arrangements, policies, laws, and programs).

(10) The 23rd Session of the Asia-Pacific Regional Space Agency Forum (APRSAF-23)

The 23rd Session of the Asia-Pacific Regional Space Agency Forum (APRSAF) was held from 15 to 18 November in Manila, Philippine. It was co-organized by the Philippine Council for Industry, Energy and Emerging Technology Research and Development - Department of Science and Technology of the Philippines (DOST-PCIEERD), Ministry of Education, Culture, Sports, Science and Technology (MEXT) and Japan Aerospace Exploration Agency (JAXA).

The APRSAF was established in 1993 to enhance space activities in the Asia-Pacific region. Attended by space agencies, governments, and international organizations such as the United Nations as well as companies, universities and research institutes, this Forum is the largest space-related conference in the Asia-Pacific region. Now APRSAF has 4 Working Groups;

Space Applications Working Group (SAWG), Space Technology Working Group (STWG), Space Environment Utilization Working Group (SEUWG) and Space Education Working Group (SEWG). The participants of APRSAF share information about their activities and the future plans for their countries and regions in each working group APRSAF also supports international projects designed to find solutions to common issues such as disaster management and environmental protection.

ADRC joined Space Applications Working Group (SAWG) and reported activity of Sentinel Asia. The Sentinel Asia initiative is one such activity, and involves the use of space-based information in the form of satellite images for disaster management in the Asia-Pacific region. ADRC has been tasked with the responsibility of receiving emergency observation requests from ADRC member countries and Joint Project Team (JPT) members

Sentinel Asia marks 10 years anniversary in 2016. ADRC reported a trend of Emergency Observation Request in the past decade. It was highlighted that the number of EOR is increasing in the recent year. Also ADRC introduced two good practices in Vietnam and in Myanmar. Provided satellite images and product were utilized for DRR activity in both country. However it remains some points to be discussed such as data sharing in each country.

(11) The 2nd Steering Committee Meeting of Sentinel Asia and Joint Project Team Meeting

1) The 2nd Steering Committee Meeting of Sentinel Asia

ADRC attended the 2nd meeting of Sentinel Asia Steering Committee held in Bangkok, Thailand, on 19th and 20th January, 2017.

The meeting was attended by JAXA as the secretariat of Joint Project Team, Sentinel Asia, Space agencies in Asia working as Data Provider Node, DPN, Universities and research organizations as Data Analysis Node, DAN and ADRC representing DRR organisations in Asia.

Day 1 started with the opening remarks by the two co-chairs of SC, Dr. Lar, AIT and Mr.K. Suzuki, Executive Director, NIED, followed by a briefing by JAXA on Steering Committee Mandate and status and lessons learnt from emergency observation so far. ADRC then reported advantages of earth observation satellite imagery at diverse phases of DRR and challenges of Sentinel Asia operation from the viewpoint of DRR organisations. As a start of discussion, ADRC pointed out some emergency situations in which satellite imagery could deliver useful information facilitating DRR operation including mega disasters affecting extensive geographical coverage beyond borders or flood affecting remotely located areas difficult to access lasting weeks, volcano eruptions hindering the use of airplanes, and so on to identify the strength of Satellite imagery for DRR purposes.

Space agencies and research organization reported about the DAN activities. The day 2 focused first on basic idea to discuss the strategic plan after the 10th anniversary, which will be discussed throughout this year towards the APRSAF scheduled in autumn 2017.The

agenda of the 10th anniversary event scheduled in March was also discussed and approved.

2) Joint Project Team Meeting in Vietnam (March 2017)

The Sentinel Asia Joint Project Team Meeting (JPTM2017) was held from 8 to 9 March 2017 in Hanoi, Vietnam. It was co-organized by the Vietnam Academy of Science and Technology (VAST), Ministry of Agriculture and Rural Development (MARD) and Japan Aerospace Exploration Agency (JAXA).

The Sentinel Asia initiative is one such activity, and involves the use of space-based information in the form of satellite images for disaster management in the Asia-Pacific region. ADRC has been tasked with the responsibility of receiving emergency observation requests from ADRC member countries and Joint Project Team (JPT) members.

ADRC reported a trend of Emergency Observation Request in the past decade. It was highlighted that the number of EOR is increasing in the recent year, and also the changes of necessary days from occurrence of disaster to distribution of data. Furthermore, ADRC reported the procedure of the Emergency Observation Request (EOR) making and activation of the Sentinel Asia, and present challenges of EOR.

One day before the JPTM2017, the memorial event of 10th Anniversary of the Sentinel Asia was held at the same venue on 7 March 2017. The organizaions of DMO, DPN, DAN and the personal which contributed to the Sentinel Asia in the past decade were celebrated. ADRC, awarded as DMO with MARD, introduced a Booklet of “Good Practice of the Sentinel Asia”, and committed further contribution to make more and more good practices in the future with JPT and ADRC members.

6. International Recovery Platform (IRP): History and Current Activities

6-1. The Establishment of IRP

While the capacity of the UN system for disaster response and humanitarian assistance are widely recognized, there is currently a vacuum in terms of the UN's capacity and system-wide mechanisms for post-disaster recovery efforts, particularly those with a risk reduction focus.

Experience increasingly affirms that the post-disaster recovery phase provides a critical opportunity to shift the focus from saving lives to restoring livelihoods, and is an important time for introducing measures to reduce future disaster risk. Effective recovery can help close the gap between relief and development, and can transform disasters into opportunities for sustainable development. This occurs when efforts are made to support local and national recovery processes at an early stage, when risk reduction considerations are factored into all recovery activities, and when the synergies between development, humanitarian, and other actors involved in the response phases are properly channeled. A successful recovery effort, then, is predicated on having advance agreements and mechanisms in place so that the recovery process is effectively conceived and managed, and is initiated in a timely manner. This includes such measures as appropriate assessment methodologies, pre-established resource mobilization mechanisms, surge capacity to support UN Country Teams, and standing coordination mechanisms.

Shared concerns related to the UN approach and processes for post-disaster recovery have resulted in the formulation of a joint initiative, the International Recovery Platform (IRP), by the UN system, ADRC, and other partners, with the encouragement and support of Japan as well as other donors and key program countries. This initiative was discussed at the 2005 UN World Conference on Disaster Reduction (WCDR) during session 4.9 on Post Disaster Recovery. Representatives from the ADRC, UNDP, UN-HABITAT, ILO, and other concerned UN agencies expressed their respective agency commitments and support for the proposed international platform for recovery. The meeting resulted in a recommendation for the establishment of the International Recovery Platform (IRP).

In four months after the WCDR, the International Seminar on Post Disaster Recovery, in support of IRP, was held at Hyogo House on 11-13 May 2005. IRP was officially established in Kobe.

6-2. The Governance Structure of IRP

IRP consists of 16 governments, UN agencies, and international organizations including ADRC (as of March 31 2017).* IRP focuses on the following three priority activities for recovery: (a) Knowledge Management and Advocacy, (b) Training and Capacity Building and (c) Enhancing Recovery Operations.

As described in IRP Strategic Framework 2015-2020, IRP Secretariat is located in Kobe and

responsible for convening IRP Steering Committee meetings and disseminating information on IRP activities and knowledge products.

* IRP members: Asian Development Bank (ADB), Asian Disaster Reduction Center (ADRC), Cabinet Office of Japan, Centro de Coordinación para la Prevención de los Desastres Naturales en América Central (CEPREDENAC), Hyogo Prefectural Government, International Labour Organization (ILO), Ministry of Foreign Affairs of Italy, Swiss Agency for Development and Coordination (SDC), the World Bank, United Nations Centre for Regional Development (UNCRD), United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), United Nations Human Settlements Programme (UN-HABITAT), United Nations International Strategy for Disaster Reduction (UNISDR), United Nations Office for Project Services (UNOPS), World Health Organization (WHO).

6-3. IRP Activities in FY 2016

6-3-1. "International Recovery Forum 2017"

"International Recovery Forum 2017 ~ Build Back Better Towards Resilient and Healthy Communities ~" was organized on 24 January 2017 at Hotel Okura in Kobe, Japan. It gathered over 140 participants from 33 countries, including government officials, practitioners, experts, policymakers, and students.

Background

Health is recognized in the Sendai Framework for Disaster Risk Reduction 2015-2030, in the 2030 Agenda for Sustainable Development, and in many other landmark international frameworks and agreements – indicating the urgency of addressing the complex challenges and gaps along this area. Mandated to act as an international mechanism for sharing of experiences and learning on build back better among countries and all relevant stakeholders, IRP adopted "Build Back Better Towards Resilient and Healthy Communities" as the overarching theme of the International Recovery Forum 2017.

Objectives

The main objectives of the Forum are:

- Explore how "Build Back Better" in recovery, rehabilitation, and reconstruction can be addressed in the 2030 Agenda for Sustainable Development; and
- Explore knowledge and understanding of "Build Back Better" in recovery, rehabilitation, and reconstruction through sharing of country experiences; and
- Explore strategies and actions on health in the context of "Build Back Better" through sharing experiences on integration health agenda into disaster recovery, including consulting on the updated edition of Guidance Note on Recovery for Health.

Summary

The Forum was commenced by three opening remarks. Mr. Stefan Kohler, Chair of the IRP Steering Committee, noted the significance of the topics covered in the Forum by referring to one of the Sustainable Development Goals, Goal 3 “Ensure healthy lives and promote well-being for all at all ages”. Mr. Shigeki Habuka, Vice Minister for Policy Coordination of Cabinet Office, Government of Japan, shared his reflection on recovery experiences in Japan. The last remark was delivered by Mr. Toshizo Ido, the Governor of Hyogo Prefecture, who emphasized the importance of passing on the knowledge and lessons from the recovery process to next generations and how Hyogo sought to achieve a ‘creative recovery’ from the Great Hanshin Awaji Earthquake in 1995.

The Forum 2017 comprised of keynote speeches, panel discussions, and a presentation of IRP knowledge product. Two keynote speeches were delivered to highlight recovery challenges from recent disasters, specifically the case of Southern Thailand Floods in January 2017 and the case of Kumamoto Earthquake in April 2016. To understand what it takes to promote resilient and healthy communities in the context of recovery, two panel discussions were organized, namely “Build Back Better for Resilient Community” and “Integrating Health in Recovery”.

The Forum was also an opportunity to present the consultative edition of the Updated Guidance Notes on Recovery for Health (coordinated by the IRP Secretariat) to elicit further inputs and feedback.

Fig. 6-3-1 International Recovery Forum 2017

Keynote speeches highlighted challenges from recent disasters

In his keynote speech, Police Lt. Gen. Nadhapit Sanidvong (who spoke on behalf of the Minister of the Interior, Kingdom of Thailand) highlighted three key challenges brought by the floods, namely: restoring livelihoods, rebuilding infrastructures, and managing the overall recovery plan. Actions to address these challenges included land use readjustments, strict enforcement of King’s guidelines for flood prevention (e.g. monkey cheek and spillway), and allocation of budget for DRR anchored to the concept of build back better.

In the second keynote speech, Prof. Yoshiaki Kawata (DRI, Japan) pointed out a unique challenge for recovery in Kumamoto due to persistent earthquake aftershocks – where over 4,000 aftershocks higher than magnitude 1 had so far been recorded. Restoring livelihoods and facilitating immediate logistical support to impacted communities were the challenges faced. Actions to address these challenges included the creation of a "Working Group on Emergency Response and Livelihood Support Measures" to facilitate deeper investigation and recommend solutions. One of the recommendations mentioned was to adopt a "push mode" approach, where the national government is expected to immediately send emergency support to impacted communities without waiting for a formal request from the local governments.

Panel 1 on "Build Back Better for Resilient Communities"

This panel discussion focused on how to prepare to build back better in recovery, rehabilitation, and reconstruction as recognized in landmark agreements like the Sendai Framework and the 2030 Agenda for Sustainable Development. The panelists included Prof. Yoshiaki Kawata (DRI, Japan), Mr. Jack Radisch (OECD, France), and Ms. Gerilee Bennett (FEMA, USA). This session was moderated by Stefan Kohler (UNOPS).

Following insights were introduced:

- Paying attention to logistical details. It is recommended to explore logistical details (e.g. goods and materials transportation, daily operations, managing temporary housing, and sanitation) to build back better.
- Good governance as the key to good recovery and promoting transparency in implementing recovery programs. Corruption, or certain political and business interests can compromise build back better. OECD emphasized the need for regularly monitoring recovery process and funds. Transparency through resource tracking mechanisms can help address it. Good governance and transparency in recovery is also critical for the Goal 16 of the Sustainable Development Goals.
- Understand the socio-cultural dynamics and adapt to the situation. While existing policies and legal frameworks facilitate local decision-making, social dynamics and cultural conditions may hinder recovery process. FEMA presented community-based disaster recovery in the U.S. by introducing how flood-affected communities' recovery through community empowerment, emphasizing the importance of community inclusiveness and pre-disaster planning.
- Explore viable financing options with private sector. Financing is among common challenges for recovery. The audience suggested exploring mechanisms for recovery programs involving private sector further.
- Adopt socially inclusive policies. The audience raised the importance of inclusiveness (ensuring "no one is left behind") in recovery and reconstruction efforts to achieve build back better.

Panel 2 "Integrating Health in Recovery"

This panel discussion put emphasis on whether and how health considerations were taken into account in the recovery process. The panelists included Mr. James Newman (GFDRR, The World Bank), Dr. Hari Parajuli (Nepal Reconstruction Authority, Nepal), Mr. Shuichi Kasai (Japan Pharmaceutical Association) and Dr. Ryoma Kayano (WHO Kobe Center). This session was moderated by Ms. Setsuko Saya (Cabinet Office, Government of Japan), who raised two key questions to the panel: Why is it difficult for the health sector to recover? How can the health sector contribute to the entire recovery outcome?

Following points were discussed:

- Integrating health into disaster recovery programs for countries. WB highlighted it, suggesting using tools such as PDNA.
- Formally engage the private sector in recovery. Following the recovery from earthquake in 1995, Kobe's reputation as a "medical city" for its leading pharmaceutical industries contributed to the reconstruction of Kansai region's economy as a part of national government's initiative. Importance of engaging private sector in investing in recovery, including expanding collaboration between public and private sectors, was emphasized.
- Seize the support from professionals. JPA presented pharmacists' roles during disasters, and the utility of "okusuritecho" (documented records of prescribed medicines), and "Mobile pharmacy" (pharmaceutical service vehicles that deliver medicines to remote areas with difficulties accessing large health facilities). "Mobile pharmacy" demonstrated many individuals', institutions', and groups' willingness to assist health sector's recovery. Exploring mechanisms promoting and managing volunteerism for health sector's recovery, including preparing for professional volunteer initiatives prior to disasters, was suggested.
- Enhance communication systems. Disasters may overwhelm digital communication systems by damaging infrastructures. Implementing alternative communication systems functional during disasters, increased coverage and accessible to digitally-impaired populations was recommended.
- Encourage wider community participation and collaboration. The urgency and demands for immediate progress can leave some groups behind in recovery, especially socially vulnerable groups. Wider community participation and inclusive recovery planning and implementation can help address it.
- Prepare to and measure the progress of build back better. Pre-disaster actions (pre-agreements and pre-contracts, including with private sector) can address many recovery issues. The question "How do we know we are building back better?" was raised. Using Open-ended Inter-Governmental Expert Working Group on Indicators and Terminology relating to Disaster Risk Reduction as a reference was recommended.
- Need for more research on long term recovery phases. WHO suggested the need for

more research on long term perspective on recovery, including psychosocial effect on disaster survivors.

Closing

In closing, Ms. Setsuko Saya (Cabinet Office of Japan) shared her impression of the Forum. Firstly, she recognized IRP as a unique community, where people of different backgrounds and expertise come together to discuss and explore knowledge on recovery. Secondly, she affirmed the Forum is an avenue where knowledge and expertise on recovery can be drawn, shared, and applied. Finally, she observed that most of participants of the Forum were middle level practitioners that play critical roles in recovery efforts, who also learned about policies and political dynamics shared by top officials like ministers and governors. She encouraged wider participation in the upcoming Forums.

6-3-2. IRP coordinated a session on "Build Back Better" at the 7th AMCDRR

The International Recovery Platform, where ADRC is pioneering member, coordinated a thematic session at the Asian Ministerial Conference on Disaster Risk Reduction, 3-5 November 2016 in New Delhi, India. The session was entitled "Strategies and Actions on Build Back Better" held on 4 November 2016, 13:00-14:30, Hall 6 at Vigyan Bhawan. Six high-level speakers of the session shared their respective experiences and lessons relative to: (i) policies and strategies, (ii) institutional arrangements, (iii) financing mechanisms, and (iv) implementation arrangements and recovery management - the key elements relevant to build back better. About 150 individuals participated in the session, where each speaker outlined key strategies and actions for build back better ranging from the areas of governance, gender, pre-investment, social inclusion, and sustainable development.

Fig. 6-3-2 Session on “Build Back Better” at the 7th AMCDRR

H.E. Vongthep Arthakaivalvatee, Deputy Secretary-General ASEAN Secretariat, reported that ASEAN is setting forward a regional policy on build back better based on the recovery and reconstruction component of the ASEAN Agreement on Disaster Management and Emergency

Response (AADMER). The regional policy sets forth the process and the timeframe for assessment, recovery plan formulation, resource mobilization, coordination, and transition of recovery plan to development plan so that member states are guided. With the AADMER in place, member states are about to improve safer structural and non-structural measures during reconstruction. Other specific examples of regional efforts include Tripartite Core Group partnership in recovery from cyclone Nargis in Myanmar as well as development of guides such as the Recovery Toolbox and the Disaster Recovery Reference Guide.

Mr. Sushil Gyewali, Chief Operating Officer of National Reconstruction Authority of Nepal, shared the key challenges of the Post-Disaster Recovery Framework 2016-2020. In terms of policies, the challenges include managing political interests, community expectations, compliance to build back better principle, and operations of the new National Reconstruction Authority that adopts a new perspective but with old team. In terms of institutional arrangement, the challenges are institution building against the pressure of delivery as well as the capacity to deliver reconstruction that complements national resources with international expertise. In terms of financing mechanism, the challenges include ensuring international commitment, financing, and realistic recovery planning and implementation. In terms of recovery management, a robust and decentralized reconstruction coordination and implementation mechanism was designed and instituted as well as engaging community.

Mr. Austere Panadero, Undersecretary at the Department of the Interior and Local Government of the Philippines, highlighted the key initiatives that help address the gaps in DRR and recovery efforts. In terms of policies, land use plan is the 'mother' of all plans and the basis for 'build back better' at the local/community level. Additionally, hazard-proofing of public investments is advocated through planning-programming-budgeting linkages as well as better DRRM-CCA informed criteria for project development and evaluation. In terms of institutional arrangements, the barangay-level or village-level DRRM-CCA baseline information is being generated locally and communities are strengthened through capacity building activities down to the household levels. In terms of financing mechanisms, initiatives such as Climate Change Expenditure Tagging (CCET) and the Seal of Good Local Governance through disaster preparedness audits are put in place. Finally, in terms of recovery management, a seamlessness of local development plans such as those drawn from Typhoon Haiyan experience in the Visayas and the "whole-of-government" approach under NDRRMC-OCD are among the many examples of tried and tested implementation arrangements.

Prof. Vinod Menon, Senior Advisor Caritas India, pointed that community-centered policies are essential. He introduced the "Community-Centered Risk Management" Framework for build back better, emphasizing inclusive recovery with special attention to the weak and marginalized groups. The framework was presented to be one of the solutions to address existing policy gaps as it facilitates: (i) coherence and convergence of policies relative to DRR, CCA, and SDGs; (ii) inclusion of the weaker sections of society as the hallmark of all recovery strategies; and (iii) support for resilience building of communities affected by ethnic conflicts, atrocities against vulnerable sections, violence and complex emergencies.

Mr. Achyut Luitel, Director of Practical Action Nepal, introduced the South Asian Disaster Report 2016, which outlines 12 recommendations for build back better in Nepal, namely: (1) promote multi-tier, multi-stakeholder policy directions; (2) harmonization and standardization of policy, legislative, and regulatory instruments; (3) ensure institutional demarcation for phase-out planning and implementation; (4) holding institutions accountable for addressing DRR in development interventions; (5) focus on vulnerable within vulnerable; (6) enable the potential and capacity of women as decision-makers; (7) make housing reconstruction owner-driven; (8) make schools safe for children; (9) building on local solutions; (10) move from cash transfer to risk transfer; (11) rebuilding micro and small enterprises; and (12) building disaster risk-informed development for resilience.

Ms. Shaila Shahid, Team Leader Gender and Water Alliance Bangladesh, highlighted two policy actions, namely: (i) inclusion/awareness raising, where in the case of Bangladesh, actions such as participation of women in disaster management councils and local government, volunteerism, and representation in the management bodies are promoted; and (ii) capacity building focusing on understanding gender, identifying social relations between men and women, and how these relationships are socially constructed to encourage leadership role.

After active discussions, Mr. Stefan Kohler of UNOPS and chair of the session offered the summary. First, recovery phase is an opportunity to build back better, which is essential to reduce vulnerability and make the development gains more sustainable. It can be more successful of done with inclusion of the weak and marginalized. Second, pre-investment is an important element for build back better to ensure development continuity, such as promoting risk-informed land use planning. Third, awareness, knowledge, and capacity such as in reference to gender and marginalized groups are essential in facilitating effective preparation to build back better in recovery, rehabilitation, and reconstruction Finally, build back better in recovery is a large-scale institutional and technical effort, which requires all the stakeholders--government, civil societies, and private sector --to collaborate and work together such as the whole-of-government approach of the Philippines.

6-3-3. Pre-Disaster Recovery Planning Orientation Workshop

Upon request of the Manila Observatory, and in collaboration with the SM Prime Property Company and the Philippine Disaster Resilience Foundation (PDRF), the International Recovery Platform/Asian Disaster Reduction Center (IRP/ADRC) facilitated an orientation workshop on pre-disaster recovery planning (PDRP), 29 April 2016 at the Asian Institute of Management, Makati City, Philippines. The event gathered about 90 recovery decision-makers, planners, and implementers from public and private sectors, including civil society, scientific community, academe, media, and representatives of local communities to learn the essence of pre-disaster recovery planning. The composition of participants was diverse to effectively simulate the PDRP exercise and to facilitate complementarity of recovery support functions.

The workshop explored various approaches of formulating a PDRP based on existing tools and experiences, including strategies, actions, and case studies from global experiences and

highlighting Japan's pre-disaster recovery agreements as observed during the recovery from the Great Hanshin-Awaji Earthquake 1995, the Great East Japan Earthquake 2011, and the Kumamoto Earthquake 2016. The importance of the PDRP was emphasized by prominent

Fig. 6-3-3 Pre-Disaster Recovery Planning Orientation Workshop

speakers, namely: Ms. Antonia Loyzaga of the Manila Observatory, Ms. Liza Silerio of the SM Prime, Mr. Guillermo Luz of the PDRF, Gen. Alexander Pama of the Office of Civil Defense, and Ms. Remedios Endencia of the National Economic Development Authority (NEDA). The speakers generally recognized that PDRP is essential because all governments and communities face similar organizational and policy issues in a disaster recovery (e.g. governance, financial management, effective operations, redevelopment standards, infrastructure, transportation, health, and livelihoods), so it pays to plan in advance. Firstly, it increases the "speed" of recovery when all stakeholders (i.e. multi-sectoral, multi-disciplinary, and inter-ministerial/departmental) plan in advance. It facilitates coordinated planning and implementation that minimizes uncertainties, overlaps, and bottlenecks. Secondly, it builds stronger relationship among all stakeholders that limits poor decision taken under post-disaster stress. It prepares stakeholders' full participation in recovery - making it easy to engage and reach a risk-informed decision. Finally, it establishes beforehand the modalities for financing recovery process, including pre-agreements and contracting services.

Using the Metro Manila earthquake scenario shared by Dr. Renato Solidum of the Philippine Institute of Volcanology and Seismology (Phivolcs), the workshop came up with two main outputs. One was a Checklist for Pre-Disaster Recovery Planning and the other was a Template on Pre-Agreement for Disaster Recovery. As way forward, the participants agreed to scale up discussions on PDRP with National Disaster Risk Reduction Management Council (NDRRMC) and explore the options for pre-agreements in disaster recovery, rehabilitation, and reconstruction.

6-3-4. Build-Back-Better through Pre-Disaster Recovery Planning: An Orientation Workshop

The academic network comprising the Universiti Utara Malaysia (UUM), the Universiti Teknologi Malaysia (UTM), the Universiti Teknologi Mara (UiTM), the Universiti Tenaga Nasional (UNITEN), the Universiti Sains Malaysia (USM), and the Universiti Sains Islam Malaysia (USIM) requested the orientation-workshop to: (i) gain greater understanding of build-back-better through pre-disaster recovery planning for flood as well as the possibility of integrating this concept in the academic courses; (ii) enhance the capacities of faculty members to train other lecturers, students, and practitioners on build back better through pre-disaster recovery planning, and (iii) explore the application of PDRP to achieve a more effective flood management.

Fig. 6-3-4 Group Photo of the Orientation Workshop

About 35 academic professors, lecturers, and officials from the National Government participated the workshop - including representation from all members of the academic network, the Malaysia Civil Defence Department (JPAM), the Ministry of Education (KPM), Fire and Rescue Department (JBP), District of Kemaman, and Mercy Malaysia. Two keynote speeches were delivered to set the tone of the workshop. The first speech was delivered by Mr. Rosman Roslan, District of Officer of Kemaman, Terengganu, highlighting the district's initiative on pre-disaster recovery planning for flood. In particular, the district officer described how Kemaman facilitated the pre-arrangements with hotels and hospitals in case of floods. The second speech was delivered by Mr. Saiful Effendi of the Ministry of Education, where he described the proposed guidelines on disaster risk reduction for public schools. The group exercises of participants came up with two outputs. One was a checklist for pre-disaster recovery planning for Malaysia and the other was a set of strategies and actions for livelihoods recovery.

As for the next steps, the participants agreed to continue the discussions, either physically or virtually. Among the recommended follow-up actions were: (i) documentation of Kemaman flood recovery case and share the report to IRP/ADRC; (ii) review the IRP/ADRC materials on pre-disaster recovery planning and proposed possible module/syllabus for inclusion in academic

course; and (iii) production of knowledge products on disaster recovery for flood, including handbooks designed for practitioners and policymakers. The academic network for flood management research in Malaysia is closely working with the Majlis Keselamatan Negara (National Security Council), the Meteorological Department and Department of Irrigation and Drainage (DID), the Kemaman Land and District Office, and the Ministry of Higher Education.

6-3-5. IRP/ADRC at the Regional Forum on Post-Disaster Recovery

During the "Regional Knowledge Forum on Risk-informed Land Use Planning in the Context of Post-Disaster Recovery", which was organized by the Asian Development Bank (ADB) on 17-18 November 2016 in Manila, the IRP Secretariat was invited to send one recovery expert to share global experiences. The forum was attended by over 100 decision-makers and specialists with expertise in land use management, disaster risk management, and post-disaster recovery. The key speakers were from Canada, Indonesia, Japan, Myanmar, New Zealand, the Philippines, and Thailand who discussed how disaster risk related issues can be addressed through land use/spatial planning in the context of post-disaster recovery.

The forum recognized that large-scale disasters often result in changing spatial structures due to corresponding large-scale reconstruction activities. Hence, the recovery process that follows provide opportunities to address both the pre-existing spatial development related challenges as well as the new ones. Some actions that may be introduced to address the issues associated with land use and housing in the post-disaster phase, may include: (i) introducing new land use strategies; (ii) regulating and providing incentives to rebuild away from hazard-prone areas; (iii) proposing new spatial growth models that factor in changing hazard patterns; (iv) addressing issues related to land title and rights; (v) adopting participatory approaches towards rebuilding thereby improving social cohesion; and (vi) undertaking a combination of structural and nonstructural investments to manage future disaster risk.

The forum covered three thematic sessions, where key messages and recommended actions were presented. The first session dealt with recovery policies, wherein policy actions may be focused on addressing the challenges related to the availability of land, risk information, local capacity, finances, and in meeting the speed required to implement activities on the ground. The second session dealt with the horizontal and vertical coordination issues, especially between national and local governments. The suggestion that came up from this session was to revisit and address the underlying causes of disaster risk. Adoption of a system-wide approach (such as focusing on watersheds) and design recovery measures that strengthens vertical and horizontal linkages may help contribute in addressing the issue. The final session dealt with good practices and innovative tools. It is in this session that IRP shared some of the international experiences. The recommendations from IRP included: reviewing past disaster experiences by specifically performing "failure analysis" and "build back better"; selecting from "menu of options" of strategies and actions from global experiences to address recovery issues and challenges - including land use and housing issues; and conducting pre-disaster recovery planning (pre-event

research, pre-agreements) to help hasten the effectiveness of land use planning in post-disaster context (i.e. strengthening institutional arrangements, policies, laws, and programs).

Fig. 6-3-5 Group Photo of the Orientation Workshop

7. Awareness raising by diverse media and conferences

In order to enhance awareness raising by addressing a wider range of audiance,, and thus to contribute further to international efforts for disaster risk reduction, ADRC has been using the mass media, while actively participating in international conferences and events.

7-1. Promotion through Mass Media

ADRC made active efforts to obtain TV, radio, newspapers and media coverage to inform widely its activities not only to disaster reduction practitioners but also to the general public. Major activities and reports throughout the fiscal year 2016 are listed below.

TV/Radio Coverage

Media	Date	TV/Radio Station	Description
TV	Jan. 24, 2017	NHK	International Recovery Forum 2017 (IRF2017) was introduced in “NEWS KOBEHATSU” and “HYOGO NEWS 845”

Newspaper and Magazine Coverage

Date	Name	Features
Sep. 19, 2016	Kobe Shinbun	Ms. Kondo, Executive Director of ADRC presented ADRC activities and Tsunami educational booklets “Inamura no Hi” translated into 10 languages.
Dec. 20, 2016	Kumamoto Nichinichi Shimbun	ADRC Study visit to the affected areas by the Kumamoto earthquake was attended by about 30 officials for Disaster Risk Reduction (DRR) from Asian countries.
Dec. 20, 2016	JIJI Press iJAMP	ADRC Study visit to the affected areas of the Kumamoto Earthquakes was held and about 30 officials for DRR from 23 Asian countries visited Masiki town and Kumamoto castle.
Jan. 24, 2017	NHK NEWS WEB	International Recovery Forum 2017 (IRF2017) was held in Kobe with persons in charge of DRR from 33 countries
Jan. 25, 2017	Kobe Shinbun	International Recovery Forum 2017 (IRF2017) was held in Kobe, Japan with about 120 participants from 33 countries and 16 international organizations.
Jan. 30, 2017	Suido Sangyo Shinbun	Prof. Hamada, ADRC Chairman explained the role of ADRC and its activities including “Program for Inviting Visiting Researchers from Member Countries”.
Mar. 8, 2017	Kobe Shinbun	ADRC introduced its activities in the Sub-Committee on Disaster Prevention of the Association of North East Asia Regional Governments.

7-2. Participation in International Conferences and Contribution to Magazines

In order to develop organic networks with international organizations and NGOs in addition to member countries, ADRC attended the following international conferences and contributed to magazines to increase its presence and to participate in discussions with relevant organizations on international cooperation for disaster risk reduction.

Table 7-2-1 Participationin International Conferences

Conference	Date	Venue	Sponsors	Attendee	Contributions
DRC participated in the 11th Meeting of Typhoon Committee Working Group on Disaster Risk Reduction	May 24-27 2016	Korea (Ulsan)	The United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), the World Meteorological Organization (WMO) TC Secretariat and the National Disaster Management Research Institute(NDMI)	Mr. Ueda	Reported also about the Asian Conference on Disaster Reduction 2016, and basic information of the Kumamoto Earthquake that had occurred in April
ISDR Asia Partnership (IAP) meeting of 2016	June 21-22, 2016	Thailand (Bangkok)	UNISDR Asia Pacific	Ms.Kondo	Provided the initial report on Kumamoto earthquakes published at the end of May
7th UN-SPIDER Regional Support Offices (RSO) Meeting	June 16-20, 2016	Austria (Vienna)	The United Nations Office for Outer Space Affairs (UNOOSA)	Mr. Ikeda	Gave a presentation on its 2015 activities and accomplishments as well as its plans for 2016, and discussed many ideas with the secretariat and other RSOs
APEC Emergency Preparedness Working Group and other relevant meetings	Aug. 15-18, 2016	Peru (Lima)	APEC	Ms.Kondo	Prepared and chaired the EPWG meetings as one of co-chairs,. Attended relevant meetings by representing EPWG and reported about the activities.
6th Annual UN-SPIDER Conference and Visited Relevant Organizations	Sept 19-22, 2016	China (Beijing)	UNOOSA and the Ministry of Civil Affairs of the People's Republic of China	Mr. Ueda	Reported the importance of proactive participation in learning events and capacity building enhancement in each country to facilitate sharing of space-based information.
The 10th APEC Senior Disaster Management Officials Forum	Oct. 8-9, 2016	Peru (Iquitos)	INDECI, Peru	Ms.Kondo	Prepared and attended the meetings as EPWG co-chair and chaired one of the session.
11th Integrated Workshop of Typhoon Committee	Oct 24-26, 2016	Philippines (Cebu City)	UNESCAP, WMO TC Secretariat , Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) and the Local Organizing Committee of Cebu	Mr. Ueda	Explained the characteristics of typhoons that landed Japan this year and reported on the enormous damage these had brought to areas that have not frequently been hit by typhoon such as Kanto, Tohoku regions and Hokkaido from the Pacific side
Asian Ministerial Conference on Disaster Risk Reduction	Nov. 2-5 2016.	India (Delhi)	Government of India	Ms.Kondo	Co-organized a Thematic Event “Partnerships and Innovations for improving Disaster Loss Accounting. And many bilateral exchanges with ADRC member countries and relevant organizations.
23rd Session of the Asia-Pacific Regional Space Agency Forum (APRSAF-23)	Nov. 16-17, 2016	Philippine (Manila)	The Philippine Council for Industry, Energy and Emerging Technology Research and Development - Department of Science and Technology of the Philippines (DOST-PCIEERD), Ministry of Education, Culture, Sports, Science and Technology (MEXT) and Japan Aerospace Exploration Agency (JAXA).	Mr. Ikeda	Reported a trend of Emergency Observation Request in the past decade and introduced two good practices in Vietnam and in Myanmar
The 2nd Steering Committee Meeting of Sentinel Asia	Jan. 19-20, 2017	Thailand (Bangkok)	JAXA	Ms.Kondo	Made a presentation representing DRR organizations and discussed the idea of the strategic plan, and so on.

Table 7-2-2 Academic Conferences and Symposium

Conference	Date	Venue	Sponsors	Attendee	Contributions
Japan Society of Civil Engineers	7 Sep 2016	Tohoku Univ.	Japan Society of Civil Engineers	Mr. Ikeda	Presentation regarding Chile SATREPS Project

Table 7-2-3 Articles

Newspaper/Journal	Date	Author	Title
Kindai Shoubou	Jun. 2016	Mr. Arakida Ms. Kodama Ms. Shiomi	Asian Conference on Disaster Reduction 2016

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