ADRC Study Visit to the affected areas by Kumamoto Earthquakes

19-20 December 2016, Kumamoto, Japan

On 19 and 20 December 2016, ADRC together with Cabinet office, Japan organized a study visit to the affected areas by the Kumamoto Earthquakes and visited Mashiki town, Aso bridge area and Kumamoto castle, thanks particularly to Kumamoto prefecture, Kumamoto City, Mashiki town and Kyushu Regional Development Bureau, MLIT.

Background

In April, Kumamoto prefecture with a population of more than 1.7 million, located in southern Japan was hit by earthquakes measuring a magnitude seven, the highest level, on the seismic intensity scale of the Japan Meteorological Agency (JMA). More than 100 people lost their lives in Kumamoto prefecture, and around 8,000 houses were totally destroyed in Kumamoto prefecture and Oita prefecture.

ADRC organizes study visits after some major natural disasters affecting member countries, including those for the Gujarat earthquake in 2001 and the Indian Ocean Earthquake and Tsunami in 2004. The study visit to Kumamoto was organized to facilitate exchange of views among member countries by: learning from the damages and the status of recovery from the earthquakes; sharing of experiences; and discussing the best mix of policies and measures towards build back better (BBB). Among the participants, 23 ADRC member countries were represented together with other delegations from the academia, the private sector, and the relevant local governments.

Day 1: Opening and Session1

Opening remarks: ADRC Chairman, Prof. Masanori Hamada, in his opening remarks mentioned three distinct challenges encountered in the context of Kumamoto earthquakes:

- *Reliability of Earthquake Prediction*: In the case Kumamoto, the first strong shock felt on 14 April was learned to be a foreshock which was followed by the main shock of 16 April.
- *Disaster Management in the midst of continuous aftershocks:* The earthquakes in Kumamoto pose huge challenges in response and recovery efforts due to continuous aftershocks.
- *Recovery of Cultural Heritage*: The Kumamoto Castle, which was severely impacted, has become the symbol of recovery efforts.

Ms. S. Saya, Director, Cabinet Office, Government of Japan, Chair of ADRC Steering Committee, shared some of the key messages drawn from the report published by the Cabinet Office to improve disaster risk reduction (DRR) policies, strategies, and actions by learning from the case of the Kumamoto Earthquakes:

- *Need for "Push-type support" to relief and emergency efforts*: Usually, the national government waits for the "request for aid" from the affected local governments. However, lessons from Kumamoto found that most local governments were impaired to make the request. Hence, without waiting for request, the national government pursued a "push mode" approach by immediately sending relief to impacted municipalities.
- *Need for "collaborative efforts" to support impacted local governments:* The report also tackled issues how impacted local governments can accept support. In view of this, collaborative options like facilitating the role of Japan Volunteer Organization or similar platform, the role of NGOs, and the role of private sector to collaborate in local response and recovery efforts can be explored.
- *Need for "preparedness to recover":* Developing the recovery plan after the disaster might be too late. In this regard, it is important to plan ahead how to build back better in case of disaster, mitigate existing weak infrastructures, invest in resilient housing, and communicate the importance to prepare to build back better.

Keynote Speech: **Japan facing mega disasters : Steps towards overcoming the challenges**

One of the main messages from the keynote speech, delivered by **Prof. Makoto Iokibe, Chair, Reconstruction Design Council in Response to the Great East Japan Earthquake** is to apply relevant lessons from past experiences to further improve DRR policies and programs. Scientific and evidence-based analyses of historical information provide bases for actions to address the limitations of existing DRM systems. The lessons from the Great Hanshin-Awaji Earthquake of 1995, the Great East Japan Earthquake of 2011, and the Kumamoto Earthquakes of 2016, all indicate the inevitability of stronger shocks in the next 20-30 years. Based on historical information and experiences, the following actions may be promoted to limit the impacts of strong earthquake and/or tsunami in the future.

First, *enhance social awareness and the capacity to overcome potential impacts*. Preparation can limit the impact of future disasters. So communities need to assess their state of preparation and move from "less prepared" to "better prepared" in order to handle the impacts of strong shocks in the future. Prior to the Great East Japan Earthquake, regular tsunami drills were conducted in the schools of Kamaishi City, which saved the lives of students and teachers from tsunami. A different scenario happened in Okawa town that cost about 500 lives due to long discussions whether to evacuate or not.

Second, *promote quick warning systems*. The use of modern technologies can facilitate quick warning of eminent disaster. In Japan, quick warning is immediately sent to mobile phones in case of typhoons, earthquakes, and tsunamis. A more advanced warning system is instituted for the bullet trains to stop in case of earthquakes.

Third, *apply relevant lessons in managing response and recovery efforts*. Learning from past experiences improves how to organize response and recovery efforts. The following experiences illustrate the importance of applying lessons learned.

- In **rescue** operations, "mutual-help" is important within 24 hours. This was demonstrated in the Kobe earthquake, where most of the victims were rescued by family and neighbors from collapsed houses and buildings.
- In **relief** operations, the "push approach" can be adopted, as suggested by the Cabinet Office.
- In **reconstruction** efforts, "creative recovery" or "build back better" needs to be promoted.

Photo: Mongolia raising the question of insurance system and school and hospital damages.

Session 1: Status of the affected areas: Briefings chaired by: Ms. S. Saya, Cabinet Office

Efforts by the Kumamoto prefecture: Mr. K. Honda, Director General on Crisis Management, Office of the Governor, Kumamoto Prefecture briefly provided an overview of the Earthquakes and measures taken by the prefecture including those for recovery and reconstruction. The case of Kumamoto is characterized by: two earthquakes of level seven within 28 hours; continued aftershocks; affected 83 % of the population; and the maximum share of evacuees was 10.3 % of the total population. The prefecture observed that collaboration with relevant parties and provision of temporary housing units by reflecting the evacuees' opinion was successful. Further efforts will however be necessary regarding key DRR facilities including DRR centers, trunk roads and lifelines that had been affected. In addition, awareness raising targeting residents should have been strengthened, as lack of which led to poor preparedness against natural disasters among residents.

Infrastructure recovery: Mr. S. Nomura, Deputy Head, Sand control group, Kumamoto Branch Office, Kyushu Regional Development Bureau of MLIT reported the recovery status of the slopes that significantly collapsed at the Aso Bridge area. On 16th April, due to the main shock, large volume of sand eroded extending 700 m length and 200 m width. The Aso Bridge collapsed, impacting the Japan Railway line and the National road no.57. Since Aso Bridge directly supports people's daily lives and widely used by tourists, its immediate recovery is imperative. In order to avoid secondary disaster from the slopes, unmanned method (applied at the occasion of the Mount Unzen volcano eruption) was adopted for removing sands left on the slopes. Participants visited this area in the afternoon of Day1.

Extensive support to Kumamoto by Union of Kansai Governments and Hyogo Prefecture:

Mr. H. Okubo, Superintendent of Emergency Management, Hyogo Prefecture and Director General, Region-wide Disaster Preparedness Office, Union of Kansai presented the support they extended to Kumamoto. The Union of Kansai Governments dispatched three persons 90 minutes after the first earthquake, and after the main shock (the second earthquake), its on-site headquarters was opened in the Kumamoto Prefecture office. The headquarters started coordinating with Kyushu regional 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 as well as support staff. Hyogo prefecture 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 from their assistance for Kumamoto.

Many questions were raised including those from Iran on the procedure of support provided by national government, from Bangladesh on temporary house provision, from Vietnam on recovery and build back better, from Armenia on Insurance, from Philippines on the support for household damage, from Cambodia on support provided by the private sector, and from Malaysia on housing reconstruction.

Study visit to the affected areas 1-1: Mashiki Town

In afternoon of Day1, participants first visited Mashiki Town, a suburban residential area of Kumamoto City and home to 34,600 population as of February 2017. It was impacted by the two earthquakes of level seven on 14th and 16th April. Reports indicated 27 deaths, 2,768 totally destroyed houses, and 3,033 partially destroyed houses. The number of evacuees reached 16,050, and accommodated into 10 evacuation centers. As of 14 June, 1,562 evacuees moved to temporary housing in 18 areas. Each temporary housing site has community centers so as to avoid isolation of the residents.

On 6 July, the "Basic Principles of Mashiki Town Recovery" was adopted. And from 7th July, the town started dismantling and removing the houses assessed as "half-damaged" or more "severely damaged" by the disaster certificate.

In Mashiki town, the participants had seen affected housing area, where removal of debris is underway and may take another two or three years to complete. The team then visited a community center of the largest temporary housing complex, "Techno area" and discussed the challenges in supporting the affected people with the town officials.

Study visit to the affected areas 1-2: Aso-bridge, briefing by Kumamoto branch office, MLIT

The second destination of the Day 1 was the Aso Bridge area. Landslide occurred in this area, and the unstable earth and sand remain dangerous since a heavy rainfall can accelerate further collapse. Participants had an on-site briefing about the ongoing operations such as the removal of unstable sand by using unmanned machine. They also visited a small temporary office where technicians remotely operate the machines. Kumamoto branch office also presented the plan for recovery including building of a new bridge.

Day 2:

Session 2 : Lessons learnt from member countries to support Kumamoto

Sub-session 2-1: Damage to cultural heritages and participatory process for recovery through encouraging tourism

The morning of Day 2 was divided into four sub-sessions, in which participants exchanged their experiences.

The first sub-session focusing on Kumamoto Castle was moderated by Secretary **Mr. Lokdarshan Regmi, Ministry of Home Affairs, Nepal**.

Mr. K. Mishima, General Manager of Tourism and Exchange Department, City of Kumamoto summarized 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, and city will strive to accelerate the 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 particular GLOF in Bhutan, followed by **Ms. Sang Khov, Deputy Secretary General, National Committee for Disaster Management, Cambodia** who talked about the damages on cultural heritage, in particular, Angkor Wat due to climate change and vandalism. She highlighted policies to prevent the damages by controlling the number of tourists, training security guards, and awareness raising targeting tourists to limit the damages.

Sub-session 2-2: Enhancing the Effectiveness of Emergency Response

Commissioner Mr. Wee Teck Eric Yap, Singapore Civil Defense Force moderated the sub-session by first stressing that Asian region is most prone to disasters, and therefore, it is critical to be prepared in order to respond effectively.

The first input was from **Mr. Rodolfo Demosthenes Centeno Santillan, Assistant Secretary, Office of Civil Defense, Philippines**. He presented the emergency relief measures against Typhoon Haiyan which impacted three regions in which existing plan or preparedness measures did not work due to the scale of the disaster, and in particular, “storm surge”. The country reviewed the relevant laws and enhanced the response plan as well as the Incident Command System (ICS). In addition, the Local Government Units (LGUs) were encouraged to develop their respective recovery plans, including “adopt a neighbor municipality”, wherein a high-income local government can support a low-income disaster-impacted local government.

The second input was provided from **Ms. Nilar Htun, Ministry of Social Welfare, Relief and Resettlement, Myanma**r. She reported about DRR system in the country including the Focal Ministry in charge of emergency operations, and the Disaster Management Law.

Thirdly, **Dr. Raditya Jati, BNPB, Indonesia** on the earthquake that hit Aceh on 17 December 2016. He stressed that the availability of risk map contributed to the rapid response when the earthquake happened and raised the challenges of assessing the damages on infrastructure, rescue works, and referred to Sentinel Asia support in providing satellite images that were provided through LAPAN- BNPB coordination. He also stressed the importance of coordination with other relevant line ministries to have a comprehensive analysis towards BBB of Pidie-Aceh. With this comprehensive collaboration, the cycle of disaster management had been put into one stimulus timeframe that works more efficiently and faster. The damaged infrastructure had been comprehensively identified, which facilitated preparation of the temporary schools and hospitals as priorities. AHA center had also contributed to the coordination on emergency response and relief.

Sub-session 2-3: Evacuation and Rehabilitation: Facing societal changes and increasing diversity

Sub-session 2-3 moderated by **Mr. Badral Tuvshin, Chief, National Emergency Management Agency of Mongolia** started with a presentation by **Ms. T. 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, the Centre so collected and provided information to non-Japanese people in English and other languages. Throughout the study undertaken after the Earthquakes, they have learned that daily contact with non Japanese people is a key to effective emergency operation. In response to the question by Ms. Saya, Ms. Katsuya stressed the importance of staying connected with each other on daily basis.

Mr. Md. Zakir Hossain Akanda, Ministry of Disaster Management and Relief, Bangladesh compared his impression of Mashiki town with the experiences of his country. In Bangladesh, NGO will react more quickly than the government and no temporary housing is provided. He also proposed to share the technology for unmanned operation. Finally, he stated that "an earthquake will not destroy a country rather, it strengthens the communities."

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 assessment for all the houses after a disaster, which has three categories, namely: dangerous, caution, and checked. He pointed out several problems for smooth issuance of disaster certificate as well as requesting payment of earthquake insurance. Finally, **Associate Professor Akira Takagi, University of Kumamoto**, who, together with his students, opened a volunteer-based Café called "Ohisama" in the Techno temporary housing area in Mashiki Town, presented their activities. The café was opened to encourage social activities among evacuees and support children by providing specific space for children. The activities have been supported by students' voluntary activities based on donation and subvention. However, the café changed its policy and started charging a user fee in order to continue the activities that require funding.

Sub-session 2-4: Recovery, Reconstruction, and Build Back Better

Mr. S. Srinath Miyanawala, Permanent Secretary to the Ministry, Sri Lanka moderated the sub-session and started by stressing the importance of integrating DRR in recovery. He also mentioned Sri Lanka's recent disaster and the plan to transfer the government insurance scheme for disasters (where almost all citizens are covered) to the private sector.

The first input was provided by **Mr. Suporn Ratananakin, Disaster Management Specialist of Department of Disaster Prevention and Mitigation, Ministry of Interior, Thailand** who reported how the floods of 2011 damaged the heritage of Ayutthaya. Surrounded by the three rivers, Ayutthaya was left flooded for three months and impacted by erosion and salt water. More than 100 historical monuments were affected, which raised significant concern among 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, Armenia** briefly explained about the damages caused by the Spitak earthquake in 1988. He highlighted the absence of construction standards and poor architectural methods as leading factors contributing to damages. During the discussions, Indonesia inquired about the indirect damages to the communities located in Ayutthaya and how they can build back better. Mr. Ratananakin replied that the plan is to relocate the communities outside Ayutthaya. In addition to the plan, raising awareness about the value of Ayutthaya and provision of job opportunities will be carried out. At the end, Ms. Saya of the Cabinet Office who asked the member countries about the gaps between expectation and reality based on their experiences in recovery operations. Sri Lanka reported about lack of land and budget, and absence of insurance system while Korea commented that residents would protest against the government if recovery is delayed. Cabinet Office shared the reconstruction experience from the Great East Japan Earthquake, where discussion with local residents was given importance to make the efforts more inclusive. In particular, the Reconstruction

Agency provided relevant information to residents by publishing monthly progress report. In regard to support for non-Japanese residents, Korea inquired about funding assistance. Ms. Katsuya, Kumamoto International Foundation, explained that the international association was authorized by Ministry of Home Affairs. Each prefecture in Japan has an international association with an agreement to take the role of supporting non-Japanese in case of disasters. Based on this agreement, the affected local governments in Kumamoto were supported by other local governments, and the cost for multi-lingual support managers necessary for this assistance was financed by the Ministry. She also mentioned that under the Japanese system, the cost for managing evacuation centres is from national government, while other costs are born by the local governments.

Study visit to the affected areas 2: Kumamoto Castle

Afternoon of Day 2 was dedicated to visiting Kumamoto Castle site that was closed after the disaster, thanks particularly to the city of Kumamoto. In this castle, the wooden turrets of Udo, the Higashijuhakken, and the Fukai gate are among those designated as "national important cultural properties". The Kumamoto castle site, including the ramparts, is designated as "National Special Historic Site". The Earthquakes affected 13 "national important cultural monuments" leading to significant damages including collapse of building and walls. In order to accelerate recovery works, which may take more than 20 years, a long term plan will be adopted. 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, supported only by one pillar that survived from the earthquakes, and sustained by a heavy operational vehicle.

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