

Final Draft Report :



UN-GGIM-AP QUESTIONNAIRE Roles of National Geospatial Information Authorities (NGIAs) for Disasters

Summary

Based on its workplan established in October 2015 at the UN-GGIM-AP 4th meeting, UN-GGIM-AP WG2 on Disaster Risk Management sent out a questionnaire to member states. The purpose of the questionnaire survey is to investigate the present roles of disaster management authorities and NGIAs, and to find potential areas for extended roles of NGIAs and collaboration with disaster management authorities through the use of geospatial areas.

Of the 56 member countries of UN-GGIM-AP, we received responses from the following 14 countries (as of the end of March).

To the respondent countries, we thank them very much for their cooperation despite their busy schedules. We are extremely grateful, as we were able to collect valuable feedback thanks to their generous support.

Sub Regions	Respondent countries
Central Asia (0)	No Countries answered.
Eastern Asia (5)	China/ Hong Kong, China/ Japan/ Macau, China/ Mongolia.
Northern Asia (0)	No Countries answered.
Southern Asia (2)	Bangladesh/ Sri Lanka.
South-Eastern Asia (5)	Indonesia/ Malaysia/ Philippines/ Singapore/ Viet Nam.
Western Asia (0)	No Countries answered.
Oceania (2)	Australia/ Fiji.

Questionnaire - summary results

Section1

- Regarding the types of major natural disasters, landslides (12 countries) and floods (12 countries) were identified the most, followed by earthquakes (9 countries), storm surges (9 countries) and wind and water hazards by a typhoon etc. (9 countries).
- Of the 14 countries, it was understood that 12 have disaster risk management organizations and 7 maintained laws to govern disaster risk management policies



in their countries. As well, 13 of the 14 countries, much of the information pertaining to disaster risk management organizations and policies is posted on the websites and can easily be accessed.

Section2 (Targeting the 12 respondent countries that their organization engages in practices and services prior to disasters.)

- It was understood that the countries whose NGIAs engage in practices and services in case of disasters (12 countries), engage in various activities prior to, during and post disasters.
- Six countries have national laws and/or bylaws, which lay the foundation of disaster risk reduction activities in their organization.
- Four countries responded that their organization has a section, which is mainly responsible for disaster risk reduction and/or management, and engage in various activities to conduct capacity building for the staff.
- Most of the countries (11 countries/12 countries) that have disaster risk management organizations, suggested in their replies that there is a strong collaboration between NGIAs and the disaster risk management organizations, including in data sharing and joint drills, etc.

Section3 (Targeting the 12 respondent countries that their organization engages in practices and services prior to disasters.)

- Regarding the NGIAs that replied to the questionnaire, it was understood that they have various geospatial information products used in case of disasters.
- Regarding the geospatial information products used in case of disasters, eight countries responded that they also provide paper-based materials to the disaster management organizations, etc., in addition to digital data.
- 83% of the respondents (10 countries/12 countries) said the geospatial information products used in case of disasters are used by disaster management functions in local governments, making up a large ratio like those that said disaster management functions in national governments.

Section4 (Targeting the 12 respondent countries that their organization engages in practices and services prior to disasters.)

- Of the many NGIAs whose responses we received, it was understood that the provision of trustworthy, timely geospatial information is recognized as a challenge in managing geospatial information for disaster risk reduction.
- Proposals of collaborations between related organizations, international cooperation and the structuring of databases were identified as solutions to the challenge.



➤ When asked what roles they think are required for NGIAs, prior to, during, and post disasters, and the approaches they are planning in the future, the respondent countries brought up plans such as the creation of rules to effectively transmit data, the creation of hazard maps, and the utilization of satellite images and UAV (Unmanned Aerial Vehicle).

Section5

➤ 14 best practices were provided by 10 of the countries.

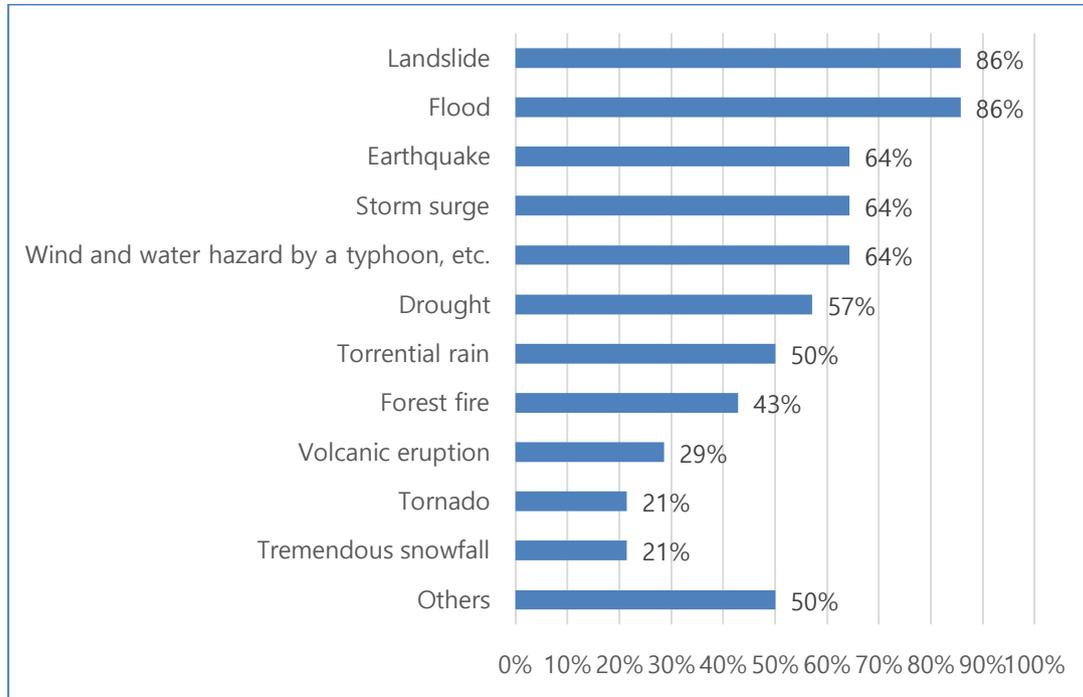
Section6 (Targeting the two respondent countries that said their organization does not engage in practices and services for disasters.)

- NGIAs that are not currently engaged in activities for disaster risk reduction, brought up challenges in engaging in disaster risk management, such as making 3D earth models more minute, and connecting to the NSDI web portal.
- Demands like the sharing of other countries' legal documents containing the types of products/emergency measures provided to manage disaster risk management, and sharing of the best practices were identified as expected activities of UN-GGIM-AP-WG2.



SECTION I. GENERAL ISSUES ON DISASTER RISK REDUCTION

1.1. Total results of each country's major natural disasters



*Percentage of countries checked within responded 13 countries

Regarding what kinds of major natural disasters their country has, landslides (12 countries) and floods (12 countries) were identified the most, followed by earthquakes (9 countries), storm surges (9 countries) and wind and water hazards by a typhoon etc. (9 countries). Among the disasters identified in "Others," were adhoc flash floods (Singapore), peat fires and smog (Malaysia), sea level rise (Viet Nam) and tsunamis (Australia, Indonesia, Japan) etc. As well, it can be conjectured that these disasters reflect the potential needs of geospatial information for disaster countermeasures in the entire Asia-Pacific region.

1.2. When questioned about the installation of disaster prevention organizations, almost all of the respondent countries (12 countries/14 countries) said that they are installed in their country. It is believed that the result shows each country recognizes disaster risk reduction as one of the important policy issues.

1.2.1 When questioned if there are English documents or an English URL regarding disaster prevention organizations, although no countries provided English documents, 13 of the 14 countries responded with a website URL. Almost all the respondent countries recognized the disaster risk reduction URL, and a means to acquire information through the Internet has been established. As well, it was understood that because it is disseminated in not just their native language but English as well, the information is easily attainable by the international society.



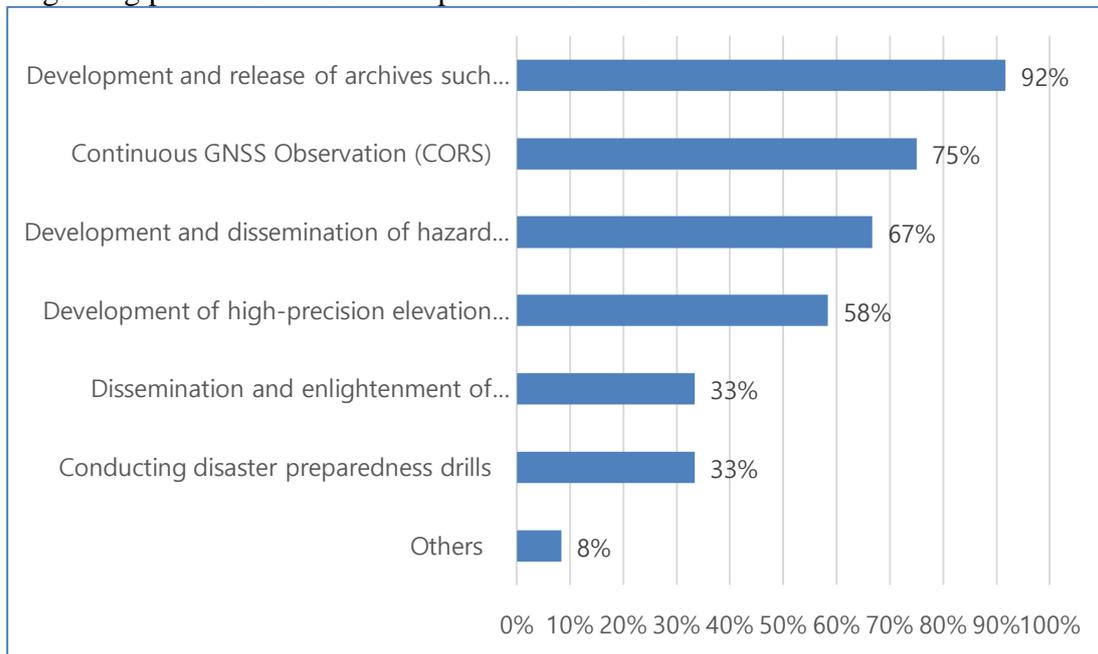
1.3. When asked about the laws governing disaster risk reduction policies in their countries, seven of the 14 countries have laws governing disaster risk reduction policies, with a legal framework regarding disaster management in place. Among the respondent countries, there was also a country (Sri Lanka) that does not have laws, but disaster risk reduction policies governed by disaster management policies. Also, Australia responded to the effect that a legal framework establishing the roles of the government and local government exists.

1.3.1 When asked if there were English documents or an English URL regarding laws governing disaster risk reduction policies, while none of the countries provided English documents, seven of the 14 countries responded with a website URL. It was understood that in most of the countries, English translations were disseminated to the international society through the Internet.

SECTION II. ACTIVITIES OF YOUR ORGANIZATION FOR DISASTER RISK REDUCTION

2. When asked if their organizations engages in practices and services prior to, during, and post disasters, 11 of the 14 countries responded to the effect that they engage in practices and services in case of disasters.

2.1. Regarding practices and services prior to disasters



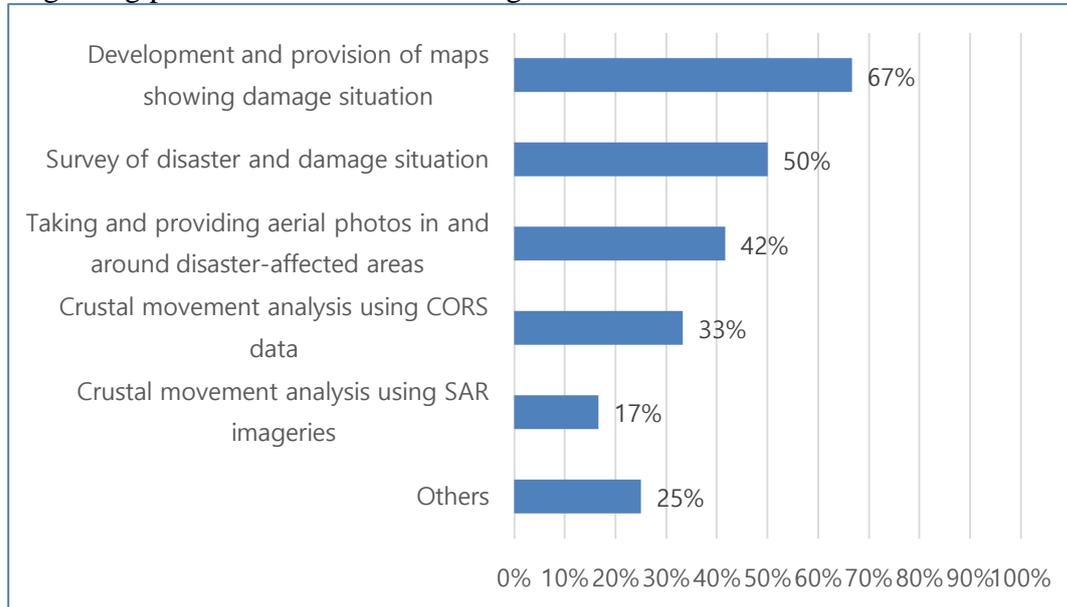
*Percentage of countries checked within responded 11 countries

As pre-disaster initiatives, a high ratio was noted for maintenance of archives such as topographic maps, aerial photos etc. (11 countries/12 countries), conduction of continuous GNSS observations (9 countries/12 countries), and maintenance and dissemination of hazard maps and risk maps (8 countries/12 countries). Among other initiatives, there were also countries (Fiji) that engaged in practices like Media Advocacy and National Disaster Awareness Week. Furthermore, only four countries



implemented disaster risk reduction drills for disaster preparedness. As well, it was understood that disaster risk reduction drills were practiced roughly once a year, and its general content assumed an earthquake strike or tsunami etc.

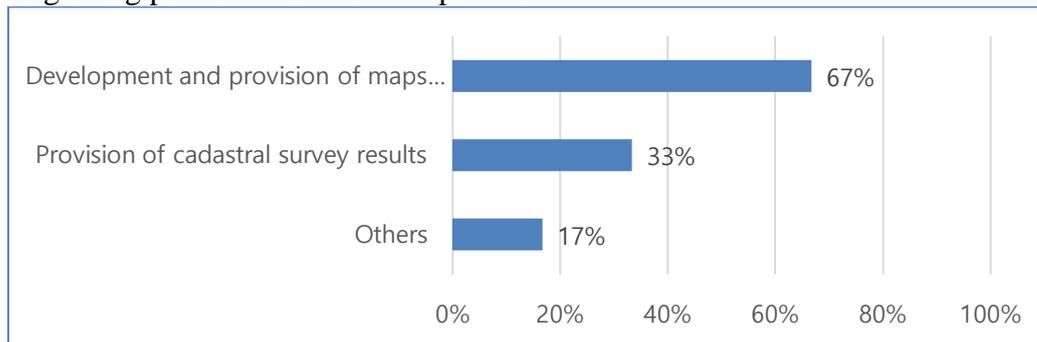
Regarding practices and services during disasters



*Percentage of countries checked within responded 11 countries

As for other activities during disasters, countries that take and provide aerial photos in and around the disaster-affected areas (8 countries/12 countries) and survey the disaster and damage situation (6 countries/12 countries) made up over half the respondent countries. Other activities included the international charter for space and major disasters (Australia), provision of land status information (Hong Kong, China), and rapid mapping and analysis (Indonesia).

Regarding practices and services post disasters



*Percentage of countries checked within responded 11 countries

It was understood that most of the countries that engage in practices and services in case of disasters (8 countries/12 countries) engaged in the development and provision of maps necessary for recovery/reconstruction plans. Other activities included damage assessments (for research and hazard/risk model validation) (Australia), crustal movement analysis using CORS data (Malaysia).



2.2. When questioned if there are national laws and/or bylaws, which lay the foundation of disaster risk reduction activities in their organizations, two of the 12 countries responded that they have both national laws and/or bylaws, while four countries responded that they have either national laws or bylaws.

2.2.1 When questioned if they had English documents or an English website of the laws and bylaws, English documents were provided by Sri Lanka. As well, among the 12 countries, five responded with a website URL. Since the laws and bylaws are provided in English, with the exception of some countries (Indonesia), it is possible for international society, to access it.

2.2.2 When asked if their organization has a department/section, which is mainly responsible for disaster risk reduction and/or management, four of the 12 countries responded to the effect that they do.

2.2.3 Regarding the countries with departments/sections, when questioned how they conduct capacity building for the staff of the departments/sections, we received the following response.

- Australia: Post-graduate study, technical courses, programming courses, development projects, continuous staff exchange.
- Indonesia: By training GIS and database for disaster risk reduction and management, involving in providing hazard maps, and setting up standards and guide lines for hazard mapping.
- Japan: lectures regarding to disaster response manuals and practices.
- Sri Lanka: In collaboration with Ministry of Disaster Management, Disaster Management Centre, Organizations like JAXA, JICA, KOICA.

2.2.4 Regarding countries without a department/section, which is mainly responsible for disaster risk reduction and/or management, we received a response to the effect that the following capacity building activities are engaged in for staff related to disaster management.

- Bangladesh: By sending personnel for training at Department of Disaster Management
- Hong Kong, China: By internal deployment.
- Malaysia: Workshops, courses, conferences and other activities related to the provision of geospatial data for disaster management.
- Philippines: deployment of selected staff through special orders. engagement in DRRM-related projects.

2.3. When questioned whether their organization works together with the disaster risk management organization mentioned in question 1.2, 11 of the 12 countries responded that they engage in collaborated activities with the government, thereby suggesting a strong collaboration between NGIAs and disaster risk management organizations.

2.3.1 When asked specifically how their organization collaborates with the disaster risk management organization, we received the following response.



- Information and Data sharing (7 countries): Australia/ Bangladesh/ China/ Indonesia/ Malaysia/ Philippines/ Sri Lanka.
- Joint drills (4 countries): Australia/ Fiji/ Hong Kong, China/ Japan.
- Personnel exchange (1 country): Japan

Regarding other activities, we received the following response.

Philippines: personnel engagement, education and communication (IEC) campaigns.

Sri Lanka: Preparing Maps, Technology transfer, Capacity building.

Viet Nam: Provide geospatial data.

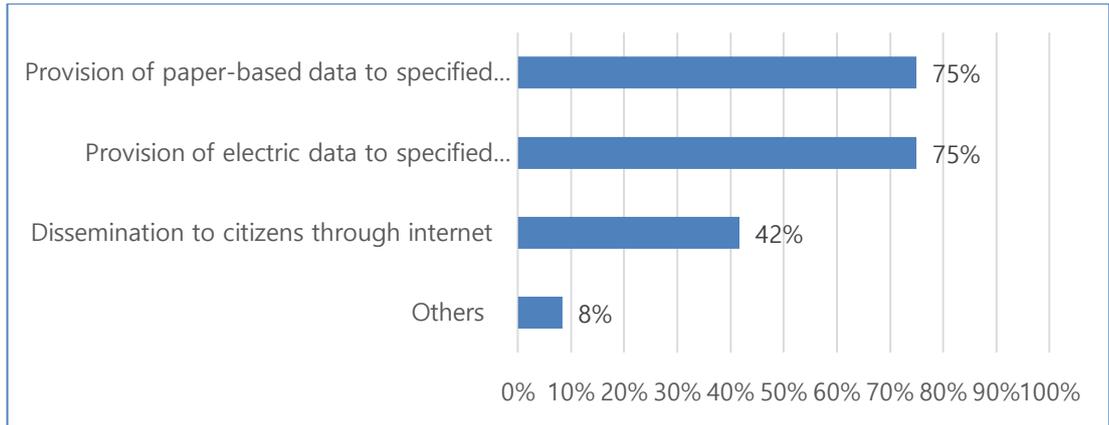
SECTION III. GEOSPATIAL INFORMATION MANAGEMENT FOR DISASTER RISK REDUCTION (DRR)?

3.1. When questioned what are the major geospatial information products for disaster risk reduction, it was understood that each NGIAs has many geospatial information products for disaster risk reduction as follows.

geospatial information products	Answer countries
Topographic map / Information	7 countries: Bangladesh, China/ Hong Kong, China/ Japan/ Malaysia/ Philippines/ Sri Lanka/ Viet Nam
DEM (Digital Elevation Model)	4 countries: Bangladesh/ Japan/ Philippines/ Sri Lanka
Aerial photos	4 countries: Bangladesh/ Hong Kong, China/ Japan/ Philippines
Database for NSDI	3 countries: Bangladesh/ Sri Lanka/ Viet Nam
Geodetic Data	2 countries: Bangladesh/ Malaysia
Land condition data	2 countries: Hong Kong, China/ Japan
Each type of hazard map	2 countries: Indonesia/ Sri Lanka

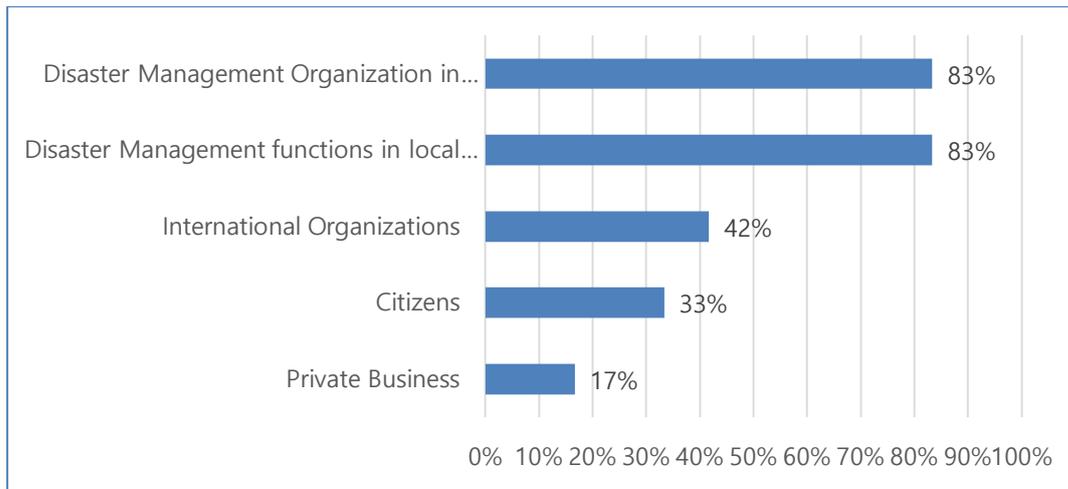
For other products, Malaysia identified numerical cadaster DB, underground installation DB, CORS data, Tidal Information etc.

3.2. When questioned what kind of channels are used for geospatial information products provision in case of disasters, the provision of digital data along with the provision of paper-based data to specified disaster management institutions etc., was the response received by the majority of countries (8 countries/12 countries). There was only one country that provided only electric data or paper-based data, respectively. Furthermore, only five countries provided information to citizens through the Internet.



*Percentage of countries checked with in responded 11 countries

3.3. When asked who the users of the geospatial information products in times of disasters are, 83% (10 countries/12 countries) responded with Disaster Management Organization in national government. Also noteworthy was that a high ratio of 83% (10 countries/12 countries) said it was used in Disaster Management functions in local governments. Furthermore, it was understood that there were relatively few users among international organizations at 42% citizens at 33%, and especially private businesses at 17%.



*Percentage of countries checked with in responded 11 countries

SECTION IV. CHALLENGES, SOLUTIONS AND FUTURE PROSPECTS

4.1. When asked what are the challenges in managing geospatial information for disaster risk reduction, many of the respondent countries mentioned the provision of trustworthy and timely geospatial information, however, on the other hand, challenges like necessary technical support, capacity building, ease of access to data were also identified.

The main responses from each country were as follows.

- Regarding the sharing of data:



- Australia: While spatial information is viewed as being critical component to decision making, the overall level of investment allocated to the coordination, management and integration of data and information is regarded as limited. EM is said to be 10% telecommunication, 20% operations and 70% information. Information is the only resource that makes possible the coordination for vital services during an emergency.
 - Hong Kong, China: Disaster risk related data may be owned by different government departments. Sharing of geospatial information among departments is important to effective disaster risk reduction.
 - Indonesia: lack of disaster data sharing protocols among local and national institutions.
 - Japan: Sharing Information with local governments, transmit degree of risks to citizen.
 - Malaysia: Geospatial information is the key to effective disaster management. An efficient effort towards collaboration and coordination from the stakeholders as well as fast delivers of data for disaster management is the main challenge in disaster risk reduction.
 - Philippines: Provision of up-to-date, reliable, timely geospatial information.
- Regarding the collecting of data:
- Bangladesh: Real Time Data Collection, Live Satellite Image and Coordinated Plan Implementation.
 - China: thematic data.
 - Fiji: No Data base.
 - Indonesia: Lack of large and very large scale base maps (larger than 1:25,000 scale maps).
 - Malaysia: To supply the relevant data when needed especially digital terrain elevation data which are not largely available.
 - Sri Lanka: Quick data capture methods.
 - Viet Nam: Data is not updated regularly
- Regarding the shortage of technical expertise:
- Fiji: Lack of expertise.
 - Malaysia: funding as well as technical skills and capabilities.
 - Sri Lanka: Capacity building in related organizations.

Among others, the Internet environment (Philippines, Sri Lanka) etc. was identified.

4.2. For suggested solutions to the challenges mentioned above (4.1), suggestions such as collaborations mainly with related organizations or international cooperation and the construction of databases were identified the most.

- Regarding collaborations with related organizations or international cooperation:
- Bangladesh: Coordination at level of the Government agencies.



- Indonesia: Provide large and very large scale base maps for priority areas, establish disaster data sharing protocols immediately, and conduct other susceptibility and hazard maps together with other institutions.
 - Malaysia: The collaboration and coordination among the related stakeholders must be intensified.
 - Sri Lanka: International co-operation to provide useful satellite images.
- Regarding the construction of databases
- Fiji: Creating a Data Base
 - Hong Kong, China: Policy in Spatial Data Infrastructure (SDI).
 - Viet Nam: To enhanced dissemination via internet.

Among others, capacity building activities and provision of technical support (Sri Lanka), and the utilization of satellite images and UAV (Bangladesh, Sri Lanka) etc. were identified. As well, in order to provide timely and trustworthy geospatial information, some countries (Philippines) have started a unified mapping program. Australia brought up solutions such as a framework for sharing data, creation of a catalog clarifying the location of responsibility, and a framework for national information strategy pertaining to crisis control.

4.3. When questioned what sort of roles are demanded of NGIAs regarding disaster risk reduction, during disasters and recovery/reconstruction, and what sort of plans they have in the future, we received the following response.

- Regarding effective data transmission processes:
- Australia: NGIAs should be able to make information available that is easy to find, easy to consume, and meet the quality standards expected for disaster management. NGIAs must work closely with their emergency management authorities to understand their needs, and manage their expectations on the quality and service of information that NGIAs provide.
 - Bangladesh: An integrated system and plan between Geospatial data provider and Disaster Management Authorities required
 - Hong Kong, China: NGIA is required to play the roles of geospatial information collector, distributor and portal owner in the course of disaster risk management.
 - Indonesia: Prior to disasters, NGIA should act as a geospatial database administrator.
 - Japan: Widely broadcasting risk Information to public prior to disasters, quick grasp of damage during disaster.
 - Malaysia: Preparedness for online data dissemination.
 - Philippines: Provide access to timely and reliable geospatial information to include base maps, aerial photographs, and satellite imageries.
 - Sri Lanka: Quick and more effective data dissemination processes.
 - Viet Nam: Development of application on internet convenient for users.
- Regarding the creation of hazard maps:



- Bangladesh: Preparation of disaster risk and hazard maps for the Disaster Management Agencies.
 - Fiji: Hazard Mapping of vulnerable communities.
 - Indonesia: NGIA should conduct crustal movement monitoring, and provide geospatial information concerning all disaster susceptibility maps, disaster risk maps, and disaster contingency plan maps/disaster evacuation route maps.
 - Japan: Publicizing the risk information according to each type of hazard.
- Regarding the utilization of satellite images and UAV
- Sri Lanka: Capture information on disaster situations / Satellite images / UAV
 - Malaysia: To provide aerial photo using UAV during and after disaster for relief and recovery purposes.

Among the other responses, post-disaster evaluations (Indonesia), the mechanization of the cooperation and creation of laws (China) and the creation of GEO portals (Philippines) etc. were identified.

SECTION V. BEST PRACTICES USING GEOSPATIAL INFORMATION IN THE FIELD OF DISASTER RISK REDUCTION

There were provisions of best practices from many countries. The respondent country and title is as follows (details shown separately)

1. Australia
 - Real Time Crisis Response Mapping for Government Officials
2. Bangladesh
 - Use of Geospatial information for DRR in Asia and the Pacific region
3. China
 - earthquake
4. Fiji
 - Tropical Cyclone, Flooding
5. Hong Kong, China
 - Contingency Plan for Natural Disasters
6. Indonesia
 - Rapid Mapping of Kelud Mountain
7. Japan
 - Floods as a result of heavy rain
 - 2011 Great East Japan Earthquake
8. Malaysia
 - The Use Of Unmanned Aerial Vehicle (UAV) To Monitor The Flood And Its Impact in Malaysia
 - Earthquake Struck Ranau In Sabah, Malaysia
9. Philippines
 - Multi-Hazard Mapping of 28 Priority Provinces and the Greater Metro Manila Area
 - The Philippine Geoportal



- Recovery and Rehabilitation After Typhoon Haiyan
- 10. Sri Lanka
- Tsunami – 2004 December 26

SECTION VI. FUTURE APPROACHES

* This section is designed for organizations which are not currently engaged in disaster management.

6.1. Anticipating the expanded utilization of geospatial information with regards to disaster management, Mongolia responded that they are scheduled to engage in some sort of activity with their organization.

6.1.1 The challenges identified for NGIAs that are not engaged in disaster management in order to attend to disaster risk management activities are as follows.

- Current technology allows us to capture terrain data at a higher productivity level. (Singapore)
- Signed Cooperation agreement between Administration of Land Affairs, Geodesy and Cartography and National Emergency Management Agency in 2014 in following field:
 - * To connect National Emergency Management Agency to NSDI web portal,
 - * To provide necessary data and information for emergency response, (Mongolia)

As well, countries also engaged in disaster countermeasures identified the following challenges.

- Provide better quality raster and vector data. (Bangladesh)

6.2. When questioned what expectations they have for the activities of UN-GGIM-AP-WG2 upon the launch of WG2 (Disaster Risk Management) regarding disaster risk reduction, the following demands were identified.

The respondent countries identified the following demands.

- To share other country's legal documents, where described who how to involve and which products to be provided by National mapping agencies in Disaster Risk Management and emergency response,
To share other country's best practices through UN-GGIM web page. (Mongolia)

As well, countries also engaged in disaster countermeasures identified the following demands.

- data sharing system internationally. (China)
- Guidelines to be developed are expected to be actionable, especially for those low- and middle-income countries. (Macau, China)



- An integrated, comprehensive and coordinated plan including contingency plan for prior to, just after and post disaster. (Bangladesh)
- Using geographic data before, during and after disasters is essential. Geographic data with accurate and current will help agencies and the people to build recovery plans. UNGGIM-AP should propose the United Nations to make recommendations to government of member countries to further promote the application of geographic data for management of natural disasters.
Promoting the development of disaster management geoportal of Asian and Pacific Ocean. (Viet Nam)

Others

Regarding the contents of this questionnaire, the respondent countries left the following comments.

- This questionnaire is very difficult to fill in. wish to simplify it.
- Thank you very much for initiating this type of importance issue. It will definitely help us to prepare disaster plan. In this regard we will try to contribute as per your requirement in future. It's a great pleasure for us for contributing in UN-GGIM-AP-Working Group 2 on Disaster Risk Management.
- We do provide geospatial information to the departments responsible for disaster risk management. The geospatial information provided has a wide range of uses inclusive of disaster risk reduction.