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Geospatial information and services for disasters

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Note by the Secretariat

Summary

The present paper contains the report of the Working Group on Geospatial Information and Services for Disasters for consideration by the Committee of Experts on Global Geospatial Information Management.

At its sixth session, held in New York from 3 to 5 August 2016, the Committee of Experts adopted decision 6/110, in which it welcomed the report of the Working Group, commended the considerable progress in developing and refining the draft strategic framework on geospatial information and services for disasters 2016-2030, and acknowledged the five priorities for action to ensure that the draft strategic framework was effectively implemented across the multiple levels of decision-making. The Working Group was also encouraged to continue working towards the completion of the draft strategic framework for consideration and adoption by the Committee of Experts. In the report, the Working Group provides information on its activities during the intersessional period, including the convening of the International Forum on Geospatial Information and Services for Disasters in Barbados in September 2016 and the interactions and presentations made at the annual meetings of the regional committees of United Nations Global Geospatial Information Management. It also describes the global consultation exercise, the feedback and guidance received from Member States, key experts and organizations and how these were incorporated in the draft strategic framework. The final version of the strategic framework, as completed by the working group, is presented for endorsement by the Committee of Experts.

* E/C.20/2017/1

I. Introduction

1. Following its establishment at the fifth session of the Committee of Experts in August 2015, the Working Group on Geospatial Information and Services for Disasters has drafted the Strategic Framework on Geospatial Information and Services for Disasters. The Framework will serve as UN-GGIM's guiding policy document in making available and accessible all quality geospatial information and services before, during and after disasters.

2. The resounding importance of developing a Strategic Framework is deeply rooted in the increasing need for geospatial information and services in disaster risk management (DRM), as evidenced by recent large scale disaster events. The Committee of Experts has recognized this need, which led to the adoption of decision 5/110¹, and the establishment of the Working Group with the Philippines and Jamaica as co-Chairs.

3. The formulation of the Strategic Framework presented strong linkages with various global policy frameworks including, but not limited to, the 2030 Agenda for Sustainable Development, the Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030 and the Global Statistical Geospatial Framework. The Framework also subscribes to the concepts of Open Data and Spatial Data Infrastructures.

4. At its sixth session held in New York from 3 to 5 August 2016, the Committee of Experts adopted decision 6/110², in which it welcomed the report of the Working Group, and acknowledged that the five priorities for action defined in the Framework are needed to ensure the availability, accessibility and usage of quality geospatial information and services across various levels of decision-making. The Working Group was also encouraged to continue working towards the completion and implementation of the Strategic Framework and related resolution for consideration and adoption by the Committee of Experts.

5. The present report informs the Committee of Experts of the activities of the Working Group and its Task Teams, the development of the Strategic Framework and the future programs and activities of the Working Group. The Committee of Experts is invited to take note of the report and to express its views on the way forward for geospatial information and services for disasters. Points for discussion and decision are provided in paragraph 22.

II. Activities of the Working Group and its Task Teams

6. The Working Group is comprised of 23 Member States; 1 non-member State; 9 UN agencies/offices; 4 international organizations; 7 professional organizations; 3 private organizations; 3 non-

¹ E/2015/46-E/C.20/2015/17: http://ggim.un.org/docs/meetings/GGIM5/E-2015-46-E-C.20-2015-17_GGIM5%20Report_en.pdf

² E/C.2016/46-E/C.20/2016/15: http://ggim.un.org/docs/meetings/GGIM6/E-2016-46-E-C.20-2016-15_GGIM6%20Report_en.pdf

government organizations; and 3 academic and research institutions. The members provided significant contributions to the deliverables of the Working Group, particularly the formulation of the Strategic Framework.

7. With the participation of the Working Group members, the co-Chairs have presented the draft strategic framework in various global, regional fora and conducted a global consultation to solicit comments and recommendations. The succeeding paragraphs provide the highlights from these consultations.

8. The importance of the draft Strategic Framework to the Caribbean States was highlighted by the Working Group during the UN-GGIM International Forum on Geospatial Information and Services for Disasters, held on 2-8 September 2016 in Bridgetown, Barbados. The Forum, which was held in conjunction with the 8th URISA Caribbean GIS Conference, was attended by 46 experts from 20 national agencies and 13 international organisations. The co-Chairs emphasized that the Strategic Framework provides a platform for the integration of spatial and non-spatial (e.g. statistical, humanitarian) datasets in disaster risk management. It also addresses the pressing need for strengthened coordination between governments and international organizations. These, among other related issues, are strongly relevant considerations given the political and socioeconomic conditions in the Caribbean Region.

9. The Forum afforded Member States the opportunity to engage with leading international experts and other key stakeholders to share their experiences and best practices in the provision and use of geospatial information and services to make improved decisions for disaster risk management, humanitarian response experiences, as well as future challenges and trends to be considered in support of the implementation of the Strategic Framework. Case examples from Mexico, Chile, Jamaica, Barbados and other countries in the Americas were presented, providing concrete approaches for the application of the priorities for action defined in the Framework. Additional cases were presented by the Philippines, China, the United Kingdom, and representatives from the UN Office for the Coordination of Humanitarian Affairs (OCHA), the UN Office for Disaster Risk Reduction (UNISDR), the World Bank, the Open Geospatial Consortium (OGC), Humanitarian Open StreetMap Team (HOT) and the University of West Indies.

10. The major discussions in the Forum are summarized as follows:

- (i) Emphasis should be placed on the provisions for the availability and accessibility of fundamental operational datasets, including administrative boundaries. The Strategic Framework can provide unique opportunities to make these datasets authoritative.³ The Forum called upon UN-GGIM to do what they can to make the second administrative level boundary dataset available and shared with the global community.
- (ii) Improved collection and sharing mechanism for crowd-sourced or volunteered geospatial information (VGI), integration of hazard and risk on national plans and policies, disaster management planning, and recognition of the roles

³ **Authoritative (data)** – refers to officially recognized data that can be certified and is provided by an authoritative source (Strategic Framework on Geospatial Information and Services for Disasters, 2017)

of academia, private sector and community of users were emphasized as crucial inputs for both mitigation and response measures.

- (iii) While institutional arrangements and technical capacities are already present in most Member States, the support of political leaders is one area that needs to be looked into in implementing the Strategic Framework. Recognizing the roles of other key stakeholders shall also be emphasized by the guiding policy document. Spatial analysis from web mapping platforms also serves as crucial inputs in establishing recovery and rehabilitation measures at the local and national levels.
- (iv) Implementing projects and programs on geospatial information management will lead to achieving the goals and targets identified in the 2030 Agenda for Sustainable Development, the Sendai Framework for Disaster Risk Reduction 2015-2030 and the Strategic Framework. As such, it is necessary for Member States and other key stakeholders to implement the Framework as a guide in managing disaster risks, achieving resiliency, and subsequently put sustainable development in their respective agendas.
- (v) Geospatial information and services are continuously being recognized as an essential element in achieving resiliency. As the Framework is slowly being recognized by all Member States and other key stakeholders, priorities should be directed to connecting its goals to the regional committees of UN-GGIM. A shared vision and objective realized down to the community level will help achieve this objective.
- (vi) Risk communication was noted as the least tackled area of disaster risk reduction, and the Working Group was encouraged to examine this topic.
- (vii) The Caribbean Island Nations expressed their full support in the finalization and implementation of the Strategic Framework. Implementing the Framework is seen to leverage enough skills and assets to better manage geospatial information and services, and the achievement of the goals per priority for action.
- (viii) The participants expressed their satisfaction with the work completed by the Working Group. The Strategic Framework on Geospatial Information and Services for Disasters received a positive recognition and participants expressed their support to have the document adopted. The participants also identified the importance of the role of the UN-GGIM regional committees in communicating the importance of the Framework; identifying champions; and monitoring of the Framework implementation in their respective Member States.

11. Consultations on the Framework were held at the Third Plenary of UN-GGIM: Americas in Mexico in October 2016, as well as its Fourth Plenary held in April 2017 in Chile, under the framework of the Geospatial Information Seminar. The regional committee recognized the relevance of the Strategic Framework prepared by the Working Group and further agreed that the agenda of UN-GGIM: Americas is to be aligned to the issues being addressed by the

Committee of Experts at the global level, with a focus on the use of geospatial information for disaster risk management.

12. The critical importance of the Strategic Framework as a policy framework for geospatial information management was highlighted by the Philippines during the UN-GGIM International Forum on Policy and Legal Frameworks for Geospatial Information and the Fifth Plenary of UN-GGIM Asia-Pacific (UN-GGIM-AP) held in October 2016 in Kuala Lumpur, Malaysia. The regional committee expressed support for the Strategic Framework.

13. The UN-GGIM-AP Working Group on Disaster Risk Management (WG2) highlighted the coordination scheme between the Working Group and WG2, particularly on the potential areas of contribution of National Mapping Authorities (NMAs), through the use of geospatial information for the effective implementation of the Strategic Framework. The WG2 agreed to formulate guidelines to help NMAs promote geospatial activities for disaster risk management, consistent with the five priorities of action defined in the Strategic Framework.

14. The role of geospatial information management in achieving resiliency in cities across the globe was highlighted by the Working Group in a joint presentation during the Kunming Forum on UN-GGIM, 10-12 May 2017, in Kunming, China. With the theme “Cities of the Future: Smart, Resilient and Sustainable”, the applicability and usefulness of the draft Strategic Framework within national and local contexts, with particular focus on the urban environment, was discussed in the session on “Resilient Cities – Strategic Framework on Geospatial Information and Services for Disasters.” Case studies from Jamaica, Dominica, Haiti and the Philippines, were also presented in the Forum.

15. Jamaica presented the Strategic Framework during the 2017 Global Platform for Disaster Risk Reduction, held from 22-26 May 2017 in Cancun, Mexico. The presentation was in line with Jamaica and the Philippines’ experience in monitoring the local implementation of the Sendai Framework for Disaster Risk Reduction. The presentation also provided an opportunity to present the Strategic Framework and its complementarity with the Sendai Framework. The plenary recommendations noted that information can benefit decision makers by providing access to geospatial information through protocols, standards and common platforms for information sharing. It was recognized that the issue of coordination and integration is essential to ensure that the Strategic Framework on Geospatial Information and Services for Disasters is implemented to complement the Sendai Framework and underscore the importance of geospatial data for monitoring global framework targets, as well as related SDG targets.

16. Following the recommendation of the Bureau, a global consultation on the draft Strategic Framework was conducted between 10 February and 17 April 2017. The Working Group integrated the comments received from the following Member States, non-member States and other key stakeholders: Algeria, Argentina, Bahamas, Bahrain, Canada, Cuba, Cyprus, Egypt, France, Germany, Jamaica, Japan, Madagascar, Mexico, Moldova, Mongolia, Netherlands, New Zealand, Northern Marianas, Norway, Saint Lucia, Spain, South Africa, Sudan, Sweden, Switzerland, Tanzania, Uganda, United Kingdom, Uruguay, Viet Nam, Hong Kong SAR, Macao SAR,

Palestine, Global Spatial Data Infrastructure Association, International Hydrographic Organization, and UN Economic and Social Commission for Asia and the Pacific.

17. The consultation resulted in revisions to the Strategic Framework to include the following:

- (i) To align with the Sendai Framework, there is a need to rephrase the outcome statement of the Strategic Framework to emphasize the social dimensions of disasters.
- (ii) Based on the UNISDR's definition of disaster risk management, this includes disaster risk reduction policies and strategies. As such, Disaster Risk Reduction and Management (DRRM) was replaced with Disaster Risk Management (DRM) throughout the document. Also, the term 'emergency' will be replaced by 'disaster', in accordance with internationally agreed definitions.
- (iii) The guiding principles were revised to reflect the intention for the implementation of the Strategic Framework to encourage transboundary data sharing in order to respond efficiently and effectively to cross-border disasters. This accords with the fundamentals of sustainability, accessibility, complementarity and interoperability. It was further noted that the implementation of the Framework will comply with the standards and requirements of national spatial data infrastructures (NSDI), or contribute to the establishment of such infrastructure if not yet in place.
- (iv) In awareness raising and capacity building, the inclusion of promoting geospatial information management, as applied to disaster risk management in academic programs at the national and local levels, was considered. It was further proposed, as a policy strategy, that the Strategic Framework recommends at the global level, the development of a long-term plan on multi-sectoral and multi-level capacity building, including scenario-based modelling and experiments.

18. A number of the comments received are beyond the Strategic Framework's scope and were deemed as being best handled through establishing linkages with other working groups/bodies within UN-GGIM.

19. The final draft of the Strategic Framework, inclusive of the inputs from the global consultation, is provided in this present report as Annex I.

III. Next steps

20. The Working Group will establish linkages with the other UN-GGIM expert/working groups and regional entities as required.

21. The Working Group will develop an assessment tool to assist Member States and UN-GGIM regional entities to evaluate and develop their respective implementation plans. Subject to the guidance of the Committee of Experts, it will monitor and report the progress of implementation of the Strategic Framework.

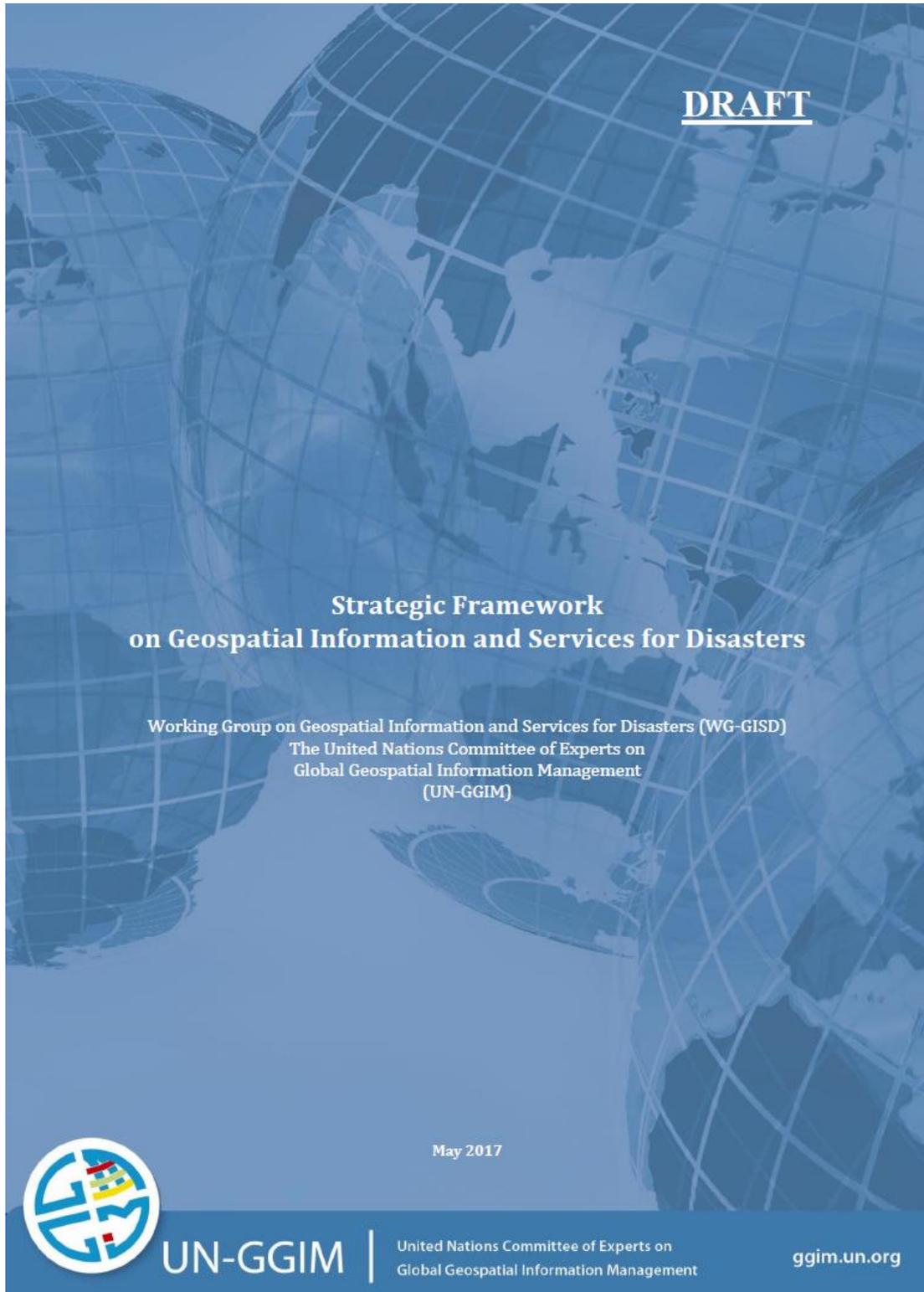
IV. Points for discussion

22. The Committee is invited to:

- (a) Take note of the present report and of the considerable progress made by the Working Group in the area geospatial information and services for disasters, inclusive of developing a Strategic Framework;**
- (b) Express its views on the draft Strategic Framework on Geospatial Information and Services for Disasters (Annex I) with a view to its adoption;**
- (c) Provide guidance on the consideration for drafting a resolution endorsing the Strategic Framework for adoption by the Economic and Social Council (ECOSOC);**
- (d) Express its views on practical means for Member States, UN agencies and offices, and other international organizations, in the implementation of the Strategic Framework; and**
- (e) Provide guidance on the future activities of the Working Group.**

ANNEX I:

**Strategic Framework on Geospatial Information
and Services for Disasters**



List of Acronyms

CODs	-	Common Operational Datasets
DRM	-	Disaster Risk Management
ECOSOC	-	(United Nations) Economic and Social Council
EEIs	-	Essential Elements of Information
FODs	-	Fundamental Operational Datasets
GA	-	(United Nations) General Assembly
GGIM	-	(United Nations) Global Geospatial Information Management
IEC	-	Information, Education and Communication
NGOs	-	Non-Government Organizations
NHAs	-	National Hydrographic Agencies
NDMAs	-	National Disaster Management Agencies
NMAs	-	National Mapping Agencies
NSIs	-	National Statistical Institutions
NSDI	-	National Spatial Data Infrastructure
TNA	-	Training Needs Assessment
UN	-	United Nations
UNISDR	-	United Nations Office for Disaster Risk Reduction
UNOCHA	-	United Nations Office for the Coordination of Humanitarian Affairs
VGI	-	Volunteered Geospatial Information
WCDRR	-	World Conference on Disaster Risk Reduction
WG	-	Working Group

I. Preamble

1. Member States have the primary responsibility to protect their citizens from social, economic and environmental impacts of disasters. During the Third UN World Conference on Disaster Risk Reduction (WCDRR), Member States reiterated their commitment to address disaster risk reduction and the building of resilience to disasters with a renewed sense of urgency within the context of sustainable development and poverty eradication, and to integrate, as appropriate, both disaster risk reduction and the building of resilience into policies, plans, programmes and budgets at all levels and to consider both within relevant frameworks.⁴
2. Geospatial information has been widely recognized as an important aspect of Disaster Risk Management (DRM). The availability and accessibility of quality geospatial data and information from authoritative sources ensure decision makers and other concerned stakeholders of an accurate common operational picture of critical scenarios before, during and after disasters.
3. During disaster situations, the data sharing mechanism to support decision-making is generally not in place. As a result, the many actors and stakeholders simultaneously engaged in response are not only gathering volumes of concurrent and inconsistent geospatial datasets but they are also concerned with issues of coordination and communication. This is aggravated further by a situation wherein local institutions that see a need to pursue geospatial data development have to compete for government resources and priorities.
4. Recent large scale disasters caused by natural and manmade hazards have demonstrated the gap between the state of geospatial information and informed decision-making. This situation highlighted the need to find solutions aimed at improving not only the availability and accessibility of quality geospatial information and services, but also the coordination and communication among stakeholders at all levels of decision-making across all phases of DRM. It underscores the strong relevance of a strategic framework not only to address the challenges on geospatial information management, but also benchmark best practices implemented worldwide across all phases of DRM.

⁴United Nations (2015): Sendai Framework for Disaster Risk Reduction 2015-2030:

http://www.wcdrr.org/uploads/Sendai_Framework_for_Disaster_Risk_Reduction_2015-2030.pdf [Accessed July 15, 2015]

5. Building on the results of a fact-finding analysis⁵ and a review of existing frameworks, rules, legislation and policies⁶, the UN-GGIM came up with a strategic framework that will optimize the benefits of using geospatial information and services by Member States and other concerned entities across all phases of DRM.
6. This framework is not only timely in view of the increasing number and impact of disasters but also contributes to the Member States' implementation of the 'Sendai Framework for Disaster Risk Reduction 2015-2030' adopted during the Third UN WCDRR in March 2015 and subsequently endorsed by the UN General Assembly (GA) in June 2015⁷. It also builds on UN GA Resolution 59/12⁸ which calls upon Member States, the United Nations and other key stakeholders to assist in addressing knowledge gaps in DRM by improving systems and networks for the collection and analysis of information on disasters, vulnerabilities and disaster risks to facilitate informed decision-making.
7. Furthermore, DRM is central to sustainable development. As such, the framework contributes to the achievement of the 2030 Agenda for Sustainable Development.

II. Expected Outcome and Goal

8. Building on the Sendai Framework for Disaster Risk Reduction (2015-2030), the strategic framework aims to achieve the following outcome:

The human, socioeconomic and environmental risks and impacts of disasters are prevented or reduced through the use of geospatial information and services.

The use of geospatial and relevant statistical information will help Member States to better understand, formulate policies on, and manage the risks and impacts of disasters. The realization of this outcome will require the strong commitment and cooperation of all stakeholders and key partners involved in DRM. These include, but are not limited to

⁵**UN-GGIM (2015):** Improving Geospatial Information Policy, Processes and Services to support Emergency Responses - Fact Finding Analysis and Proposed Strategic Framework (Final Report):

<http://ggim.un.org/docs/20151215%20Final%20UN-GGIM%20Report%20on%20Emergency%20Response.pdf>
[Accessed April 03, 2016]

⁶**UN-GGIM (2016):** Review of Frameworks, Rules, Legislation, and Policies on geospatial information and services for disasters
(under publication)

⁷**United Nations (2015):** Sendai Framework for Disaster Risk Reduction 2015-2030:

http://www.wcdrr.org/uploads/Sendai_Framework_for_Disaster_Risk_Reduction_2015-2030.pdf [Accessed July 15, 2015]

⁸**United Nations (2004):** International Cooperation on Humanitarian Assistance in the field of Natural Disasters, from Relief to Development: General Assembly Resolution A/RES/69/243:

http://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/69/243 [Accessed April 3, 2016].

governments and government agencies, UN-GGIM and UN Agencies, as well as NGOs, international partners/donors, private sector, academia and volunteers, among others.

9. The following goal must be pursued by Member States in order to attain the expected outcome:

Quality geospatial information and services are available and accessible in a timely and coordinated way to support decision-making and operations within and across all sectors and phases of disaster risk management.

Reaching this goal requires Member States to be in the position to develop, maintain and provide the necessary geospatial information and services.

10. The following targets are proposed in order to guide Member States in the assessment of their progress in achieving the outcome and goal of the strategic framework:

- a. Awareness is raised among policy makers and concerned entities on the importance of geospatial information and services to the DRM process; regular assessment, monitoring and evaluation of risks and disaster situations are conducted; and a comprehensive plan is developed to implement the five priorities for action identified in this framework;
- b. Policies on collaboration, coordination and sharing are established, issued and implemented;
- c. Geospatial databases and information products are developed, maintained and updated based on common standards⁹, protocols and processes as important tools in every decision-making process across all phases of the DRM;
- d. Common geospatial information facilities and services are established for all key stakeholders to have a common operational picture of disaster events;
- e. Information, education and communications capacities and mechanisms are built and strengthened; and
- f. Resources are made available to sustain all the activities for the enhancement of the use of geospatial information in DRM.

III. Guiding Principles

11. The strategic framework draws from the principles included in the Sendai Framework for Disaster Risk Reduction (2015-2030)¹⁰; the UN General Assembly resolution on international cooperation on humanitarian assistance in the field of natural disasters, from

⁹UN-GGIM (2015): A Guide to the Role of Standards in Geospatial Information Management: <http://ggim.un.org/docs/Standards%20Guide%20for%20UNGGIM%20-%20Final.pdf>

¹⁰United Nations (2015): [Sendai Framework for Disaster Risk Reduction 2015-2030](http://www.wcdrr.org/uploads/Sendai_Framework_for_Disaster_Risk_Reduction_2015-2030.pdf): http://www.wcdrr.org/uploads/Sendai_Framework_for_Disaster_Risk_Reduction_2015-2030.pdf [Accessed July 15, 2015]

relief to development¹¹; the UN General Assembly Resolution 59/12; the 2030 Agenda for Sustainable Development; the UN-GGIM Global Statistical Geospatial Framework; and other relevant instruments pertaining, but not limited to the concepts of Open Data, Communities and Sources, as well as Spatial Data Infrastructure. The implementation of the framework will emphasize the fundamentals of sustainability, accessibility, complementarity and interoperability, while taking into account national circumstances, and consistency with domestic laws as well as international obligations and commitments:

- a. Each Member State shall be in the position to generate, maintain and provide quality geospatial information and services across all phases of DRM;
- b. Geospatial data and information generated and maintained by Member States and the international community shall be openly accessible to the DRM community, as appropriate;
- c. The implementation of the framework shall encourage data sharing, interoperability and harmonization among neighbor countries in order to respond efficiently to cross-border disasters;
- d. The implementation of the framework shall comply with the standards and requirements of the NSDI or contribute to the establishment of such infrastructure if not yet in place; and
- e. The international organizations and developed countries shall extend and coordinate their support to developing countries, particularly the least developed countries, Small Island Developing States, landlocked developing countries and African countries, as well as middle-income and other countries facing specific disaster risk challenges.

IV. Priorities for Action

12. Taking into account the result of the fact-finding analysis¹² and the review of existing frameworks, laws, policies and regulations¹³, and pursuant to the expected outcome and goal, there is a need for a collaborative and coordinated approach within and across sectors in Member States in implementing the following five priorities for action:

- **Priority 1:** Governance and Policies;
- **Priority 2:** Awareness Raising and Capacity Building;
- **Priority 3:** Data Management;
- **Priority 4:** Common Infrastructure and Services; and
- **Priority 5:** Resource Mobilization.

¹¹United Nations (2004): International cooperation on humanitarian assistance in the field of natural disasters, from relief to development: General Assembly Resolution A/RES/69/243:

http://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/69/243 [Accessed April 3, 2016]

¹²UN-GGIM (2015): Improving Geospatial Information Policy, Processes and Services to support Emergency Responses - Fact Finding Analysis and Proposed Strategic Framework (Final Report)

¹³UN-GGIM (2016): Review of Frameworks, Rules, Legislation, and Policies on geospatial information and services for disasters (under publication)

13. Member States shall take into consideration their respective capacities, resources and priorities, as well as laws and regulations when implementing the major activities identified for each priority. These activities serve as a guide, and can be further enhanced by Member States and other key stakeholders based on their political and socio-economic situations.

Priority 1: Governance and Policies

14. The management of geospatial information and services for disasters shall be based on good governance and science-based policies. Such policies should collectively form part of other equally important policies on awareness raising and capacity building, data management, infrastructure and services, and resource mobilization. Specific activities shall include assessment and planning; institutional arrangements, collaboration and coordination and monitoring and evaluation.

National and Local Levels

15. To achieve this, it is important:

- a. For Member States to ensure political and financial support at the highest level for the successful implementation of the five priorities for action.
- b. To identify the champion and/or national entity that will oversee the implementation of the five priorities for action and ensure an inclusive participation of all stakeholders and key partners.
- c. To establish and maintain open channels of communication with the objective of improving coordination, collaboration and exchange of information and relevant resources.
- d. To regularly conduct situational assessment and analysis of the availability, accessibility and usage of quality geospatial information and services. In order to be comprehensive, such assessment shall cover the five priorities for action and based on established key performance indicators.
- e. Based on the results of the assessment, to develop and implement plans and programs aimed at establishing or strengthening the availability, accessibility and usage of quality geospatial information and services across all phases of DRM.
- f. To develop and implement laws and policies to bind all efforts in a systematic and consensus-based roadmap.
- g. To establish a comprehensive monitoring and evaluation scheme supported by a set of metrics to continuously support and further improve both the national and institutional plans and programs as well as to ensure that geospatial information and services are aligned with changing needs and priorities.

Global and Regional Levels

16. To achieve this, it is important:

- a. To encourage collaboration, coordination and partnership between government and non-government actors, between and among geospatial information and emergency response communities, and between governments and international organizations.
- b. To promote mutual learning and exchange of good governance practices and policies among Member States.
- c. To provide effective channels where Member States and other stakeholders can share technical knowledge, lessons learned, best practices and case studies.
- d. To regularly conduct assessment of the availability, accessibility and usage of quality geospatial information and services for disaster risk management and related purposes.

Priority 2: Awareness Raising and Capacity Building

17. Risks and impacts of disasters will be properly managed if Member States and other stakeholders are fully aware of their respective geospatial data and information holdings. This requires all entities to bring the necessary changes towards making available and accessible quality geospatial information and services across all phases of DRM.

National and Local Levels

18. To achieve this, it is important:

- a. To translate geospatial information and services into components that can easily be understood by a wider audience. Specific strategies may include using local languages, area and issue-based scenarios, social media and other platforms in collecting and disseminating information.
- b. To promote the inclusion of geospatial information management as applied to DRM in academic programs.
- c. To take on technical responsibilities by leading research endeavors in DRM using up-to-date geospatial information.
- d. To examine the capacities of entities to provide training and match them with inventories of existing skills among stakeholders and other key partners, and urge Member States to respond to identified gaps and areas for further improvement.
- e. To design and implement IEC campaigns and disaster simulation exercises based on the results of Training Needs Assessment (TNA) initiatives.
- f. To design and implement multilevel geospatial information management training programs as applied to DRM among the data custodians and users within Member States.
- g. To strengthen Member States and other stakeholders' competencies in establishing spatial data infrastructures and open data platforms for geospatial information and services.
- h. To identify and assess laws, policies and institutional gaps for all awareness raising and capacity building initiatives.

Global and Regional Levels

19. To achieve this, it is important:

- a. To develop and publish a long-term plan on multi-sectoral and multilevel capacity building, including scenario-based modeling and experiments.

- b. To conduct data and information management training especially among humanitarian/responders' communities.
- c. To harness the technical expertise within international partners and donor institutions through the conduct of studies, researches and models, publish and make available the results of such initiatives to recipient government, government agencies and other stakeholders.
- d. To benchmark best practices from other Member States and institutions and cascade the same to the local context. Such may come in the form of human resource and system improvements, as well as technology exchange programs. Benchmarking will also ensure that governments and government agencies are at par with current global undertakings.

Priority 3: Data Management

20. A comprehensive method of managing geospatial data and information for their optimal utility by the Member States and other stakeholders is crucial in implementing the strategic framework. These include specific activities on data development, including collection; data standards and protocols; and data use guidelines. Modern, cost-effective and open source technologies may be used to improve data and information management.

National and Local Levels

21. To achieve this, it is important:

- a. To develop a common and accessible database system of minimum/baseline geospatial information and services requirements, including an initial list of Essential Elements of Information (EEIs) addressing all phases of DRM. These include, but are not limited to comprehensive Common Operational Datasets (CODs) and Fundamental Operational Datasets (FODs) such as administrative boundaries; population; critical infrastructures and other exposure datasets; and earth observation data holdings. Crowdsourced or Volunteered Geospatial Information (VGI) may be included, but attention should be given to issues on accuracy, resolution, authoritativeness, integrity, openness, and interoperability of such datasets.
- b. To develop hazard, vulnerability and disaster risk assessment maps and other information products as crucial inputs to national and local DRM plans and in framing relevant projects, programs and activities.
- c. To maintain national and local emergency responders common contact database.
- d. To develop a registry of all international humanitarian response/assistance organizations to ensure coordination of deployment of humanitarian aid.
- e. To conduct humanitarian profiling and event or incident scenario building across all phases of DRM.
- f. To develop business use cases and data/information product templates to answer high level process needs for geospatial information in DRM.
- g. To optimize the use of geospatial information products for the development of common operational pictures of disaster events. In turn, this information will be translated by Member States and other stakeholders to reflect existing conditions at the local level.

- h. To develop data management policies including, but not limited to data collection; data sharing; data classification; data custodianship; data stewardship; metadata; data security and control; and data backup and recovery on local and national levels.
- i. To promote the importance of integrating geospatial data and statistics in DRM plans and programs.
- j. To identify and assess laws, policies and institutional gaps for all data management initiatives.
- k. To encourage the Open Data community and government institutions to engage more actively with each other for complementation and alignment of their respective datasets.
- l. To use geospatial information as a major driver for the establishment of the National Spatial Data Infrastructure (NSDI).

Global and Regional Levels

22. To achieve this, it is important:

- a. To encourage governments and the international community to openly share their data and establish mechanisms thereof that include identification of mission-specific EEIs.
- b. To encourage existing projects aimed at developing global datasets to converge and collaborate with relevant government agencies in countries, starting with NMAs, to get these datasets completed, updated and validated.
- c. To optimize the use of geospatial information products for the development of common operational pictures of disaster events within and across affected regions.
- d. To adhere to data management guidelines including, but not limited to data collection; data sharing; data classification; data custodianship; data stewardship; metadata; data security and control; and data backup and recovery in the global and regional levels.
- e. To cascade best practices, particularly established standards, protocols and processes within and among Member States.

Priority 4: Common Infrastructure and Services

23. Institutionalizing geospatial information and services requires infrastructure support, such as a common operations center, facilitated by a dedicated team of experts and support staff. This should be complemented by hardware and software acquisitions, as well as application systems which will serve as data distribution platforms. Interoperability of information will likewise require facilities and systems duly recognized and supported by Member States and other key stakeholders.

National and Local Levels

24. To achieve this, it is important:

- a. To build on existing systems to develop a common infrastructure and facility, particularly an operations center supported by a maintenance program.

- b. To implement business use cases, where operation centers will provide common support services in addressing high level process needs in all phases of DRM. A mirror system for online and offline processing of data can also be established to sustain operations during disasters.
- c. To ensure the interoperability of all systems, processes and skills among and within Member States by adhering to data management guidelines and other geospatial information management standards.
- d. To maintain the integrity of established common infrastructures and services by regularly conducting disaster simulation exercises.
- e. To identify and assess laws, policies and institutional gaps for all common infrastructure and services initiatives.
- f. To pursue the application of new geospatial information management technologies.

Global and Regional Levels

25. To achieve this, it is important:

- a. To assist Member States and other stakeholders in establishing their respective common infrastructure and services.
- b. To promote interoperability of systems and processes and share best practices to Member States.
- c. To encourage the establishment of regional geoportals for DRM.

Priority 5: Resource Mobilization

26. In order to support the activities identified in this framework, an array of human resources, as well as technical, financial and other forms of logistical and administrative support is required among Member States and other stakeholders.

National and Local Levels

27. To achieve this, it is important:

- a. To sensitize the authorities on the necessity of funding the acquisition, maintenance and updating of geospatial information. In particular, the National Mapping Agencies (NMAs) should be supported to play a key role in the implementation of a NSDI that supports the availability and accessibility of quality geospatial information and services across all phases of DRM.
- b. To encourage the academe to prioritize funding for the conduct of related research, development and extension activities, particularly in the implementation of the strategic framework.
- c. To encourage the private sectors to invest in the provision of geospatial information and related services for DRM.
- d. To identify and assess laws, policies and institutional gaps for all resource mobilization initiatives.

Global and Regional Levels

28. To achieve this, it is important:

- a. To improve access to funding support for the activities in the implementation of the strategic framework. These include provisions for grants, loans and other forms of financial support.
- b. To promote resource-sharing mechanisms among Member States and regions with common interests and in similar situations.

V. Role of Stakeholders

29. Member States should be in the position to generate, maintain and provide quality geospatial information and services. This will require the involvement of NMAs, National Disaster Management Agencies (NDMAs), National Statistical Institutions (NSIs), National Hydrographic Agencies (NHAs) and other relevant government organizations.

30. It is also recognized that the commitment, goodwill, knowledge, experience and resources of other stakeholders are key to the implementation of the strategic framework. Member States should encourage the following actions on the part of all public and private stakeholders and other key partners:

- a. Civil society groups, volunteers' organizations and other community-based organizations to fully participate in the initiatives of the government, including technical and administrative provisions relating to geospatial information and services.
- b. Private sector institutions, including financial regulators and accounting bodies, as well as philanthropic foundations, to integrate geospatial information and services as a key component to support informed decision making across all phases of DRM. They should also encourage projects at the national and local levels to adhere to established standards, protocols, guidelines and policies as well as contribute to their strengthening, if necessary.
- c. Academia, scientific and research entities and networks to focus their studies on the potential contributions of geospatial information and services across all phases of DRM. Results of these researches shall be made available and accessible to the public.
- d. Media to take an active and inclusive role at the local, national, regional and global levels in raising public awareness on the importance of geospatial information and services in DRM.

31. The UN-GGIM shall play a leading role in setting the agenda for the development of global geospatial information and services, and to promote their use to address key global challenges. As such, it will be well placed to contribute to several of the priorities mentioned in the framework, starting with:

- a. Raising the awareness of Member States and other stakeholders on the importance of geospatial information and services before, during and after disasters;
- b. Encouraging the Member States to develop and promote geospatial databases, standards, protocols and processes aimed at improving data quality and interoperability

at the national and global levels;

- c. Encouraging the Member States to develop and implement policies aimed at improving the availability and accessibility of quality geospatial information and services in support of DRM.

32. The concerned UN Agencies shall contribute to the overarching principles reflected in the strategic framework. They should provide a monitoring and evaluation scheme to ensure relevance of implemented projects, programs and activities within governments and government agencies with international agreements.

33. The international funding institutions shall consider prioritizing funding programs leading to the optimal utilization of geospatial information and services, particularly during disaster events. Similarly, expertise from these organizations can also be harnessed by Member States in implementing the technical and administrative provisions of the framework.

VI. Implementation

34. Geospatial information and services contribute vastly to the overarching effort of preventing or reducing the social, economic, and environmental impacts of disasters. Thus, Member States and other stakeholders should prioritize a geospatially-oriented agenda in their respective development plans and programs.

35. Member States and other stakeholders should commit themselves to the full implementation of the priorities for action by improving their current capacities in providing geospatial information and services across all phases of DRM and actively promoting the goals of the five priorities for action, and translate the same into national implementation plans.

36. A participatory and inclusive approach in generating, improving and managing geospatial information should be employed by all entities involved in DRM efforts.

37. Managing geospatial information and services before, during and after disasters will require all Member States and other stakeholders to institutionalize good governance practices and science-based policies supported by improved capacities on human resource, infrastructure and geospatial data management, among others.

38. In support to the Sendai Framework for Disaster Risk Reduction (2015-2030), international cooperation should be recognized as a critical element in managing geospatial information and services before, during and after disasters, and thus implementing the provisions of the strategic framework. Adopting best practices and identifying champions among Member States will augment their existing capacities in using geospatial information and services across all phases of the DRM.

Definition of Terms

Authoritative Data. These are officially recognized data that can be certified and provided by an authoritative source.

Authoritative Source. This is an entity authorized by a legal authority to develop or manage data for a specific business purpose. The data this entity creates are authoritative data.

Capacity. It is the combination of all the strengths, attributes and resources available within an organization, community or society to manage and reduce disaster risks and strengthen resilience. (UN GA Resolution A/71/644)

Common Operational Datasets (CODs). Key geographic objects needed to support the operation and decision-making during the emergency response. This would include but not be limited to: administrative boundaries, populated places, transportation network, health facilities, utilities schools, evacuation centers, among others.

Data. Facts and statistics collected for reference or analysis.

Disaster. A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts. (UN GA Resolution A/71/644)

Disaster Risk Management (DRM). Refers to the application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses. (UN GA Resolution A/71/644)

Disaster Risk Reduction (DRR). Aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development. (UN GA Resolution A/71/644)

Essential Elements of Information (EEI). The critical information requirements prepared for and by Member States and other key stakeholders at a particular time to assist in high-level decisions and agreements.

Emergency. Unforeseen or sudden occurrence, especially danger, demanding immediate action.

Exposure. The situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas. (UN GA Resolution A/71/644)

Fundamental Operational Datasets (FODs). Attributes or statistics attached to the key geographic objects defined as part of the CODs. This would include but not be limited to: population, livelihood, response capacity, among others.

Geospatial Information. Data referenced to a place – a set of geographic coordinates – on the Earth surface, whether on land or at sea.

Geospatial Services. Refers to the administrative, technical and programmatic support for geospatial-related issues and concerns. In most cases, such services require the use of spatial technologies and infrastructure support.

Hazard. A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation. (UN GA Resolution A/71/644)

Humanitarian Profile. A dynamic paper that takes into account possible events in the country, as well as in the region that could have humanitarian implications and which would require proper planning and preparedness (UN OCHA, 2011)

Key Performance Indicator (KPI). A performance measure tool used to assess and evaluate the implementation of a particular activity and/or initiative. Aside from gauging one's effectiveness, KPIs can also identify issues and gaps from implementation.

National Disaster Management Agencies (NDMAs). Pertains to an organization that is primarily responsible for managing natural and manmade disasters, and other emergency situations.

In most cases, National Disaster Management Offices (NDMOs) and National Emergency Management Agencies (NEMAs) have the same functions as NDMAs.

National Hydrographic Agencies (NHAs). Refers to the organizations that deals with the measurement and description of the physical features of oceans, seas, coastal areas, lakes and rivers for navigation, charting, and support to a number of marine activities.

National Mapping Agencies (NMAs). Institutional platforms within nations that is primarily responsible for generation, management and standardization of geospatial information and other related products. These may include maps, nautical charts, and images, among others.

National Geospatial Institutes (NGIs) have the same functions as NMAs.

National Spatial Data Infrastructure (NSDI). Refers to the technology, policies, standards and human resources necessary to acquire, process, store, distribute and improve utilization of geospatial data (Federal Register, 1994)

National Statistical Institutions (NSIs). Refers to the organizations/units that provide official statistics for national and local planning and development, and governs a Member State's national statistical system.

Open Data. Data that can be freely used, reused and redistributed by anyone – subject only, at most, to the attribute and share alike

Outcome. Results of actions based on the implementation of projects, programs and activities

Phases of DRM. Refers to the main components comprising the disaster management cycle, and is cited in this document as follows:

- Before disasters (Disaster Prevention and Mitigation, Disaster Preparedness)
- During disasters (Disaster Response)
- After disasters (Disaster Rehabilitation and Recovery)

Quality Geospatial Information. Spatial data that are fit for their intended uses or purposes in operations, decision-making and planning. Further, such data should adhere with the following ten principles: accurate; valid; reliable; timely; relevant; complete; interoperable; machine processable; documented; and secured.

Resilience. The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management. (UN GA Resolution A/71/644)

Risk. The combination of the probability of an event and its negative consequences (UNISDR, 2009)

Sustainable Development. Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

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Strategic Framework on Geospatial Information and Services for Disasters

Scope and Purpose

The strategic framework aims to guide all stakeholders and partners in the management of geospatial information and services in all phases of disaster risk management

Expected Outcome

The social, economic, and environmental risks and impacts of disasters are prevented or reduced through the use of geospatial information and services

Goal

Quality geospatial information and services are available and accessible in a timely and coordinated way to support decision-making and operations within and among all stakeholders and partners and in all phases of disaster risk management

Priorities for Action

Member States with the support of regional and international organizations as well as other relevant organizations should focus their action on the following five priorities for action:

Priority 1 Governance and Policies	Priority 2 Awareness Raising and Capacity Building	Priority 3 Data Management	Priority 4 Common Infrastructure and Services	Priority 5 Resource Mobilization
Policies, collaborative agreements and legal frameworks aiming at improving the availability and accessibility of quality geospatial information and services among all stakeholders and partners established and implemented in all phases of DRM	Awareness is raised among concerned entities on the importance of geospatial information and services and all necessary technical and human capacities are built and/or strengthened	Geospatial databases and information products are developed based on common standards, protocols and processes as important tools in every decision-making process across all phases of DRM	Common facilities and services are established for all key stakeholders and partners to have a common operational picture of emergency scenarios	All necessary technical, human and financial resources are available to sustain all the activities of DRM

Guiding Principles

The strategic framework is guided by the 2030 Agenda for Sustainable Development, International Strategy for Disaster Reduction, Sendai Framework for Disaster Risk Reduction (2015-2030), the UN-GGIM Global Statistical Geospatial Framework, UN General Assembly resolution on international cooperation on humanitarian assistance in the field of natural disasters, from relief to development and other relevant instruments. It is also guided by the principles of open data and requirements of national data infrastructure, and by the UN-GGIM's Statement of Shared Guiding Principles for the Management of Geospatial Information.

