The Science and Technology Roadmap to Support the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030

1. Context

1.1 Sendai Framework

The Sendai Framework for Disaster Risk Reduction 2015-2030 was agreed at the Third UN World Conference on Disaster Risk Reduction in Sendai, Japan in March 2015 and endorsed by the UN General Assembly in June 2015.

The goal of the Sendai Framework is to prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience.

1.2 Science and technology in Sendai Framework

There are a number of references to science and technology in the Sendai Framework. Paragraph 36 (b) for example, requests: "*Academia, scientific and research entities and networks to: focus on the disaster risk factors and scenarios, including emerging disaster risks, in the medium and long term; increase research for regional, national and local application; support action by local communities and authorities; and support the interface between policy and science for decision-making.*"

More specifically, paragraph 25 (g) states: "*Enhance the scientific and technical work on disaster risk reduction and its mobilization through the coordination of existing networks and scientific research institutions at all levels and all regions with the support of the UNISDR Scientific and Technical Advisory Group in order to: strengthen the evidence-base in support of the implementation of this framework; promote scientific research of disaster risk patterns, causes and effects; disseminate risk information with the best use of geospatial information technology; provide guidance on methodologies and standards for risk assessments, disaster risk modeling and the use of data; identify research and technology gaps and set recommendations for research priority areas in disaster risk reduction; promote and support the availability and application of science and technology to decision-making; contribute to the update of the 2009 UNISDR Terminology on Disaster Risk Reduction; use post-disaster reviews as opportunities to enhance learning and public policy; and disseminate studies*".

1.3 Science and Technology Roadmap

The science and technology community, as well as other stakeholders, came together at the UN Office for Disaster Risk Reduction (UNISDR) Science and Technology Conference held 27- 29 January 2016 in Geneva. The Conference produced the 'Science and Technology Roadmap to Support the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030' and accompanying partnerships as the main outcome.

The Roadmap is a mechanism to "foster collaboration among science communities and other stakeholder across global and regional mechanisms and institutions for the implementation and coherence of instruments and tools relevant to disaster risk reduction" around common goals and actions.

1.4 Contextualization of Science and Technology Roadmap in 2019

The Secretary-General of the United Nations, in his report to the General Assembly in 2018 has

emphasized as follow:

"*To support the implementation of the Sendai Framework Science and Technology Roadmap, the UNISDR Global Science Technology Advisory Group has been enhanced in terms of its scope and resources. This includes the establishment of a Science Technology Partnership and regional Science and Technology Advisory Groups*".

A contextualization and revision of the Roadmap was undertaken by the UNISDR Global Science Technology Advisory Group (G-STAG) in collaboration with other Science and Technology partners. The purpose was to enhance the relevance of the Roadmap by developing better coherence with other agreements in 2030 agenda like SDG (Sustainable Development Goals), Paris Agreement and New Urban agenda, and to link it to the Sendai monitoring processes. Importantly, the roadmap focus needed to better reflect the cascading nature of risks within the broadened hazard scope of the Sendai Framework. Events since 2016 are increasingly showing the interconnected nature of today's risk landscape, which urgently requires a much more comprehensive, integrated and interdisciplinary approach. This urgency is reflected in the contextualized roadmap. The process started In August 2018, with several consultations at the global and regional level held over the course of the following 9 month[1]s.

2. Structure of the Roadmap

The revised 'Science and Technology Roadmap to Support the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030' is built around the four Priority for Actions of the Sendai Framework with four expected outcomes and fifty one activities.

3. Means of implementation

It is expected that the implementation of the Roadmap needs better and more comprehensive collaboration, cooperation and commitments from all sectors of societies, including science and technology partnerships, national and local governments, private sectors, civil society, media and other stakeholders. This can be considered as an overall advocacy tool, and partners/ networks would be encouraged to make their voluntary commitments and detailed means of implementation. A detailed implementation guideline will be developed in cooperation with ST partners.

4. Monitoring progress

The Roadmap is a strategic document with a 15-year duration to 2030. It is also a working document, and will be periodically reviewed and updated in the event of future evolution of the risk landscape and related scientific knowledge, technologies, and increasing importance of indigenous and local knowledge as well as citizen science. The review will determine progress on implementation and facilitate course correction as needed to ensure relevance and flexibility in changing circumstances. The monitoring of progress will build on a review of the related online Sendai Framework Voluntary Commitments. A biannual report on progress will be issued under the leadership of the G-STAG.

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[1] G-STAG meeting in August 2018, Science and Technology partnership event in Chengdu, China in 16-17 October 2018; regional workshop on strengthening, empowering, and mobilizing youth and young professional in Jakarta, Indonesia on 6-9 November 2018. Insights from the discussions at the Global Forum on Science and Technology for Disaster Resilience, Tokyo, 23-25 November 2017 and Asia Science and Technology Conference in April 2018.

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Total Number of actions: 51 Priority 1: 17 Priority 2: 14 Priority 3: 9 Priority 4: 11	**Outcome 1: Current state of data, scientific, local and indigenous knowledge and technical expertise are assessed, updated and available on spectrum of Sendai hazards**	**Outcome 2: Scientific evidences are synthesized, produced and disseminated in a timely and accessible manner that responds to the knowledge needs of policy-makers and practitioners**	**Outcome 3: Scientific data and information support are used in monitoring and reviewing progress towards disaster risk reduction and resilience building**	**Outcome 4: Better capacity in all sectors and countries to access, understand and use scientific information for better informed decision-making**
Priority for Action 1. Understanding disaster risk [Total number of actions: 17 (8 + 3 + 2 + 4)]	1.1.1 Promote integrated and multi-disciplinary research 1.1.2 Conduct solution-driven research at all levels that involves the users in the earliest stages 1.1.3 Establish/link existing and update/maintain global databases 1.1.4 Develop methods, models, scenarios and tools 1.1.5 Integrate risk assessments across sectors 1.1.6 Promote scientific focus on disaster risk root causes, emerging risks and public health threats, insurance and social protection and safety nets 1.1.7 Analyse ethics of scientific input 1.1.8 Adopt a multi-hazard approach that integrates lessons learned, including trans-boundary, biological and technological and natech hazards	1.2.1 Develop evidence-based dissemination strategies and methodologies to inform policy and practice 1.2.2 Promote access to data, information and technology 1.2.3 Integrate traditional, indigenous and local knowledge and practices 1.2.3 Develop partnerships between all S&T and DRR stakeholders, and integrate gender equality	1.3.1 Link Science and Technology progress to Sendai Monitoring indicators 1.3.2 Promote coherence in data collection and M&E indicators with SDGs and Paris Agreement	1.4.1 Build national and local capacities for the design, implementation and improvement of DRR plans 1.4.2 Promote inclusiveness, interdisciplinary, and inter-generational participatory approaches 1.4.3 Develop expertise and personnel to use data, information and technology 1.4.4 Promote the development and use of standards and protocols, including certifications

Priority for Action 2. Strengthening Disaster Risk Governance to Manage Disaster Risk [Total number of actions: 14 (5 + 4 + 3 + 2)]	2.1.1 Consider root causes of risk and inputs from traditional knowledge for decision-making 2.1.2 Promote disaster risk assessment in spatial planning and governance both in public and private sectors and increase participation of civil society for this process 2.1.3 Integrate climate change adaptation & DRR and other relevant sectors (such as well-being, environment, health, economy, etc.) in governance mechanism 2.1.4 Develop flexible governance system to adapt to emerging risks and climate change 2.1.5 Promote the assessment of ecosystem-based development options	2.2.1 Promote dialogue and networking on DRR between scientists, academia, policy-makers, civil society, business and private sectors 2.2.2 Raise scientific awareness and improve understanding 2.2.3 Establish an understandable, practical, evidence based scientific knowledge is needed for all actors 2.2.4 Improve access to data	2.3.1 Strengthen the engagement of science in national coordination 2.3.2 Promote disaster risk assessment in planning and development 2.3.3 Promote participatory monitoring mechanism involving civil society organization and local communities	2.4.1 Promote dialogue and networking on DRR between scientists and policy-makers, civil society and business 2.4.2 Raise scientific awareness and improve understanding, considering future risk
Priority for Action 3. Investing in Disaster Risk Reduction for Resilience [Total number of actions: 9 (5 + 1 + 2 + 1)]	3.1.1 Assess & update the status of mainstreaming science & technology in DRR 3.1.2 Provide funding for science & technology in DRR to enhance knowledge, technology transfer & resilience 3.1.3 Assess the impact of investment of science & technology in DRR 3.1.4 Include scientists of all disciplines in analyzing investment in DRR 3.1.5 Conduct research and explore challenges that hinder science & technology in DRR	3.2.1 Promote various means of science communication for decision-making & policy makers	3.3.1 Monitor science & technology investment in DRR as an integral part of national plan & policies 3.3.2 Support innovations in earth observation and geospatial data for risk profiling and decision making	3.4.1 Encourage & enhance capacity of stakeholders in DRR to increase investment in science & technology

Priority for Action 4. Enhancing Disaster Preparedness for Effective Response, and to "Build Back Better" in Recovery, Rehabilitation and Reconstruction [Total number of actions: 11 (3 + 3 + 2 + 3)]	4.1.1 Promote multi hazards early warning systems with improved climate information, aerial and spatial data, emergency response services and communication to end users 4.1.2 Develop and share best practices in new threats and risks (including infectious diseases) to inform preparedness planning. 4.1.3 Identify, collect and analyze case studies and asses options to strengthen recovery and rebuilding efforts.	4.2.1 Develop, disseminate information and practices on contingency planning and protection of critical infrastructure including the promotion of build back better approach in recovery, rehabilitation and reconstruction 4.2.2 Inform national disaster risk reduction plans and strategies that focus on community preparedness and awareness, including the needs of women, children, people living with a disability and the elderly in vulnerable situations 4.2.3 Review and share build back better indicators among the relevant stakeholders	4.3.1 Identify and address the needs for the early warning for least developed countries and the small island developing states 4.3.2 Incorporate build back better in insurance policies	4.4.1 Institutionalize effective recovery and reconstruction as strategies to reduce risk and promote resilient developments. 4.4.2 Promote science based decision making for resettlement processes. 4.4.3 Generate and utilize scientific information to gain prior public consensus on post-disaster actions and to enable their smooth implementation after a disaster