UNDRR
UN Office for Disaster Risk Reduction

First Draft: 29 February 2016
Revised Draft: 13 May 2019

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*".

UNISDR Global Science Technology Advisory Group (G-STAG) undertook contextualization and revision of the Roadmap in collaboration with other S&T 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 using online platform. The process started with a discussion within the G-STAG in August 2018 and then a Science and Technology partnership event in Chengdu, China in 16-17 October 2018. It also incorporates the insights and recommendations from the Science Council of Japan's Tokyo Statement, published following the Global Forum on Science and Technology for Disaster Resilience, held in Tokyo, 23-25 November 2017. The contextualization of Roadmap was also discussed in the regional workshop on strengthening, empowering, and mobilizing youth and young professional in Jakarta, Indonesia on 6-9 November 2018.

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' includes four expected outcomes and fifty eight actions under four Priority for Actions of the Sendai Framework.

3. Means of implementation

It is expected that the implementation of the Roadmap needs 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 and initially had a 15-year duration. The roadmap is considered as a working document, and will be periodically reviewed and updated in the event of future evolution of knowledge, new technologies, new Sendai hazards 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 and to enhance north south partnership in S&T. The monitoring of progress will also be done through online Sendai Framework Voluntary Commitments, as well as periodic conferences of S&T partners like GADRI, IRDR etc.

The Science and Technology Roadmap for the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030				
Total Number of actions: 58 Priority 1: 21 Priority 2: 14 Priority 3: 11 Priority 4: 12	**Outcome 1: Assess and Update data and Knowledge** [State of data, scientific, local and indigenous knowledge and technical expertise are assessed, updated and available on spectrum of Sendai hazards]	**Outcome 2: Dissemination** [Scientific evidence is synthesized, produced and disseminated in a timely and accessible manner that responds to the knowledge needs of policy-makers and practitioners]	**Outcome 3: Monitoring and Review** [Scientific data and information support are used in monitoring and reviewing progress towards disaster risk reduction and resilience building]	**Outcome 4: Capacity building** [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: 21 (8 + 4 + 3 + 6]	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 research on effective dissemination strategies for informed decision and policy-making. 1.2.2 Promote access to data, information and technology 1.2.3 Integrate traditional, indigenous and local knowledge and practices 1.2.4 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, and report using online voluntary commitment system 1.3.2 Promote coherence in data collection and M&E indicators with SDGs and Paris Agreement 1.3.3 Develop a liaison group between the DRR community and the major global assessments, such as IPCC 6th Assessment Report and other related assessment.	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 1.4.5 Utilize knowledge resources of S&T community for effective education programs on disaster risk reduction for scientists, practitioners and communities 1.4.6 Promote systems approaches in understanding disaster for better informed decision

	Outcome 1: Assess and Update data and Knowledge	Outcome 2: Dissemination	Outcome 3: Monitoring and Review	Outcome 4: Capacity building
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 development 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, media, business and private sectors at regional, national and sub-national level 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 on DRR generated by international organizations, S&T communities, governments and different levels and stakeholders	2.3.1 Strengthen the engagement of S&T in national coordination and promote sub-national implementation. 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: 11 (5 + 2 + 3 + 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, research, technology transfer 3.1.3 Assess the impact of investment of S&T in DRR 3.1.4 Include scientists of all disciplines in analyzing investment in DRR as well as climate change adaptation, including loss and damages 3.1.5 Conduct research, develop tools, explore challenges in S&T in DRR	3.2.1 Promote various means of science communication for decision-making & policy makers 3.2.2 Promote changing roles of science and reflective practices of implementation that will contribute to the effectiveness of disaster risk reduction	3.3.1 Monitor science & technology investment in DRR as an integral part of national plan & policies 3.3.2 Collect information on voluntary evaluation of S&T investment achievements periodically in collaboration with S&T partners 3.3.3 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

	Outcome 1: Assess and Update data and Knowledge	Outcome 2: Dissemination	Outcome 3: Monitoring and Review	Outcome 4: Capacity building
Priority for Action 4. Enhancing Disaster Preparedness for Effective Response, and to "Build Back Better" in Recovery, Rehabilitation and Reconstruction [Total number of actions: 12 (4 + 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 assess options to strengthen recovery and rebuilding efforts. 4.1.4 Collaborate with the humanitarian community in exploring best practice for survivor led response and reconstruction	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 need for, and gaps in, early warning systems in the 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