

Science and technology action for a disaster-resilient world

With this declaration, we, the participants at the Global Forum on Science and Technology for Disaster Resilience 2017, held in Tokyo from 23-25 November 2017, commit to join and lead efforts by the science and technology community to work closely with stakeholders and partners at local, national regional and global levels towards the achievement of a disaster resilient world where nobody is left behind.

A new era on disaster risk reduction has begun. The Sendai Framework for Disaster Risk Reduction 2015-2030 emphasizes the importance of solid evidence and a scientific basis for risk-informed development and investment. It also highlights the important linkages and mutual reinforcement for disaster risk reduction with the 2030 agendas: the Sustainable Development Goals (SDGs), the Paris Agreement on Climate Change and the New Urban Agenda. This has been reflected by the recognition of disaster risk reduction as central to fulfilling a transformative agenda for sustainable development and building prosperity, by politicians and policy makers worldwide. The growing linkages between the post-2015 frameworks, not least through their common monitoring and reporting processes, clearly showcase this commitment. In this era, the importance of a solid scientific base for risk-sensitive planning and decision-making and the critical role of science and technology has been pronounced more than ever before.

The Global Forum on Science and Technology for Disaster Resilience 2017 in Tokyo provided the best opportunity to ascertain our contribution and future actions through discussion among global scientists and to share the message with all stakeholders, including policy makers and the private sector. It thereby builds on and expands the discussions of the science and technology community, as well as other stakeholders at the First Science and Technology Conference held 27- 29 January 2016 in Geneva, which resulted in the adoption of the Science and Technology Roadmap to Support the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 and accompanying Science and Technology Partnerships, facilitated by the UN Office for Disaster Risk Reduction (UNISDR).

In support of the implementation of the Science and Technology Roadmap, we identified the following needs under the four priorities for action of the Sendai Framework to be urgently addressed by our community

- 1) We need to contribute to knowledge on disaster risk.** The Integrated Research on Disaster Risk (IRDR) Program, co-sponsored by the International Council for Science, International Social Sciences Council and UNISDR, and the Future Earth (FE), Urban Health and Well-Being (UHW) and World Climate Research Programme (WCRP) and related science and technology communities should be supported to contribute to knowledge and to collaborate with disaster management institutions at the national level to develop a system for collection, archiving, management, analysis, and use data concerning disaster risk and disaster damage and losses. In support of policy makers and practice, we should establish and use reliable scientific frameworks for evaluating disaster risk on a regular basis, as a function of the identification and assessment of hazards, vulnerability, and exposure including single and concatenated events. The use of geographical information systems should be promoted for providing and sharing disaster risk information at different scales before, during and after disasters.
- 2) We need to contribute to strengthening disaster risk governance to reduce disaster risk.** In local and national disaster management platforms with well-defined responsibilities and authority, we should promote dialogue in local languages on disaster risk reduction between scientific sectors and policy makers; facilitate networking between them; and create and implement a systematic framework in which disaster risk assessment is used to make decisions for planning and development based on scientific evidence.
- 3) We need to encourage investment in disaster risk reduction for resilience.** We, the international scientific community, should develop and implement tailor-made methods to assess disaster risks and share those among relevant Government agencies and key stakeholders including international financial institutions and the private sector at large as the main investor in all countries; provide sufficient explanations particularly in an economic sense; propose policies that are highly effective as ex-ante investment and technologies that deliver a high return on the investment; develop application criteria for each disaster prevention measure; propose

reasonable plans for the allocation of limited resources; and strengthen the capacity of scientific and technological disaster research and investigation of private sectors.

- 4) **We need to promote "Build Back Better" in recovery, rehabilitation and reconstruction.** Towards the primary goal, "building disaster-resilient cities and communities with long term vision", we should take actions for sharing common paradigms including "rebuilding livelihoods", "rebuilding economy" and "rebuilding regional communities"; developing indicators and guidelines based on scientific evidence; and making plans for disaster recovery, rehabilitation and reconstruction processes. We need to support the development of legislation and procedures, based on enhanced scientific evidence, prior to disasters and based on scientific scenarios for possible disaster damage.

Successful disaster risk reduction will depend on innovation and interdisciplinary approaches. The Science and Technology Community is critically placed to take a lead in this effort, and to co-create and co-implement new types of science and technology in society.

- 1) **We need to promote and implement interdisciplinary and transdisciplinary collaboration.** To assess anthropogenic and technological risks as well as disaster risks associated with natural hazards, we should develop innovative approaches and technologies for risk assessment from both interdisciplinary and transdisciplinary perspectives including the humanities and social sciences. Mega or widespread small and medium size disasters that are highly complex should be addressed through collaboration among all stakeholders in emergency and normal times, in a seamless manner. The definition and usage of existing terminology should be clearly confirmed without disagreements and misunderstandings.
- 2) **We need to produce periodic synthesis reports on the state of science and technology for risk-sensitive development and investment.** To understand and measure the status and progress of science and technology in disaster risk reduction, we propose producing periodic synthesis reports in collaboration between "cognizing" science and "designing" science in a transdisciplinary way. We need to enhance resilience by promoting evidence-based policies for disaster risk reduction that clearly factor in prediction, prevention and response strategies.
- 3) **We need to contribute to national platforms for more effective use of science and technology.** The Sendai Framework highlights National Platforms as key elements for an effective disaster risk governance system. Reflecting the call for an all-of-society approach, knowledge and expertise available within the national science and technology community should be integrated into national platform activities. Work could include contributions from the Science and Technology community on translating the Sendai Framework into local languages; providing appropriate scientific advice for the collection, assessment and analysis and archiving of annual disaster records; assist the National Platform in compilation and publication of case studies on dialogue between local authorities and scientists & engineers which led to successful disaster risk reduction for application and information exchange; and assist the Government in compiling and publishing their national Sendai Monitoring reports and other relevant reports on disasters.

As a first step to pursue steady implementation of these actions, we commit to work closely with relevant stakeholders to develop and implement the following documents:

- 1) **Guidelines for strengthening national platforms for DRR and coordination mechanisms through enhanced contribution of science and technology.**
- 2) **Periodic synthesis reports on the state of science and technology for reducing disaster risk.**

It is intended to present the outcomes at the 6th Session of the Global Platform for Disaster Risk Reduction, to be held in May 2019 in Geneva, Switzerland. The outcomes will also be used by the international research programmes (IRDR, FE, WCRP, UHW) to focus their research priorities and strengthen their contributions to the Sendai Framework to enhance the understanding of disaster risk, supporting governance and prioritizing investments in disaster risk reduction and enhancing disaster preparedness for effective response.

Increased disaster risk demands an urgent response. Inaction is no longer an option. The support of all stakeholders is strongly requested.