The Expert Committee of National Commission for Disaster Reduction	Ministry of Civil Affairs, People's Republic of China	Ministry of Emergency Management, People's Republic of China	Beijing Normal University	United Nations Office for Disaster Risk Reduction

SECOND ASIAN SCIENCE AND TECHNOLOGY CONFERENCE FOR DISASTER RISK REDUCTION
Science-Policy Dialogue for Implementation of the Sendai Framework
17-18 April 2018, Beijing, China

Beijing Consensus

Summary

We, the participants of the Second Asian Science and Technology Conference for Disaster Risk Deduction held on 17-18 April 2018 in Beijing, China, renew our commitment to the accelerated implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 as the pivotal means to achieve the goals of sustainable development and resilience. We commit to develop and disseminate science-based disaster risk reduction defined by technology and innovation and reaffirm the importance of the twelve actions identified in the First Asian Science and Technology Conference for Disaster Risk Deduction in 2016 (Appendix I), and added two more actions, emerged from this conference.

To enhance these fourteen actions, we agree to collective and cooperative mechanisms on:

1. Strengthening the trans-disciplinary research and development on disaster risk science, technology and policy
2. Enhancing inclusion of science and technology groups in DRR activities
3. Accelerating the initiatives of multi-disciplinary flagship programs of science technology based DRR
4. Increasing the investment from governments, societies and other stakeholders to the research, capacity building and development of DRR Science and Technology
5. Increasing the support of governments, societies, and other stakeholders for innovations and partnership development
6. Increasing the support of government, societies, and other stakeholders for the international cooperation and exchange on science and technology-based DRR

Preamble

The Sendai Framework for Disaster Risk Reduction 2015-2030 shifts the focus from managing disasters to reducing risks. Such a shift requires a better understanding of risk in all its dimensions of environment, hazards, exposure and vulnerability; a disaster risk governance that ensures disaster risk is factored into planning and development at all levels across all sectors as well as in disaster preparedness, rehabilitation, recovery and reconstruction; and cost-benefit analysis to support prioritization of investments in disaster risk reduction (DRR) for long-term resilience.

The Sendai Framework clearly identifies the primary responsibility of each State to prevent and reduce disaster risk and emphasizes the role of science and technology. It calls to prioritize the development and dissemination of science-based risk knowledge, methodologies and tools, science and technology work on DRR through existing networks and research institutions and strengthened interface between science and policy to support all four priority areas: understanding disaster risk; disaster risk governance; investing in DRR for resilience; and enhancing disaster preparedness for response and to build back better.

A 'Science and Technology Roadmap to Support the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030'[1] has been agreed as the result of the United Nations Office for Disaster Risk Reduction (UNISDR) Science and Technology Conference in January 2016. The Roadmap includes expected outcomes, actions, and deliverables under each of the four priorities of the Sendai Framework. In support of the implementation of the Science and Technology Roadmap, the Global Forum on Science and Technology for Disaster Resilience 2017, which was co-hosted by UNISDR in Tokyo, November 2017, approved 'Tokyo Statement' and re-emphasized the importance of developing guidelines for strengthening national platforms for DRR and implementing periodic synthesis reports on the state of science and technology for DRR.

Asia has been the world's hotspot of economic development and innovation in terms of science and technology over recent decades. At the same time, the region continues to be highly exposed and vulnerable to disasters. Science and technology-based DRR was a priority in the implementation of the Hyogo Framework for Action in Asia.

Asia has a large population and very uneven economic and social development. It faces all potential hazards in the world, which featured with high frequency, high intensity, large disaster losses and high proportion of global disaster losses. In the context of global climate change and globalization, disaster risk is increasing. The 2030 global goals on DRR set by the United Nations can be hardly achieved if DRR indicators such as disaster casualties and property losses and relative proportions do not decrease in Asia. Therefore, in order to achieve the global targets, there is an urgent need to strengthen the overall science and technology-based DRR capacity in Asia, especially in countries (regions) with high population densities, economic and social underdevelopment, and accelerated urbanization process.

The 1st Asian Science and Technology Conference for Disaster Risk Reduction was held in Thailand, July 2016. Aligned with the Science and Technology Roadmap, 12 actions[2] were recommended. These actions were echoed in the AMCDRR in Delhi, India and implemented with the common efforts of countries in Asia and[3] Pacific region.

The 2nd Asian Science and Technology Conference for Disaster Risk Reduction has been held in Beijing, China, 2018. The Conference was co-hosted by the Expert Committee of National Commission for Disaster Reduction of China, Ministry of Civil Affairs of China, Ministry of Emergency Management of China, Beijing Normal University and UNISDR, co-organized by the Academy of Disaster Reduction and Emergency Response and National Disaster Reduction Center of China, and supported by UNISDR Asia Science Technology Academia Advisory Group (ASTAAG), Integrated Research on Disaster Risk (IRDR), among other partners. The conference brought together about 300 senior researchers and academics, policy-makers, practitioners, civil society and the private sector in the realm of disaster risk reduction from across Asia, and more widely, to discuss how to strengthen science-based DRR policy development in support of the implementation of the Sendai Framework in Asia.

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[1] https://www.unisdr.org/files/45270_unisdrscienceandtechnologyroadmap.pdf The Proposal of Scientific Disaster Risk Deduction

[2] https://www.unisdr.org/files/49240_49240finaloutcomedocument1stastcdrr.pdf

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Actions for Science and Technology-based DRR

The following recommended actions align with and contribute to the global 'Science and Technology Roadmap". We take due consideration of the forthcoming Asian Ministerial Conference on Disaster Risk Reduction in July 2018 and one of its expected main outcomes: the 2019-2020 Action Plan for implementation of the Asia Regional Plan.

Priority 1 – Understanding Disaster Risk
1. Enhance disaster loss and damage accounting, national and local disaster risk assessment and communication of disaster risk, with specific focuses on risks of urban and less developed regions.
2. Use space and disaster risk mapping technologies, and emerging technologies and strengthen the capacity for using these technologies for improved understanding of disaster risks at global, national and local level.
3. Strengthen regional exchange on disaster risk information and science in order to better understand complex disaster risks including risks of trans-boundary, cascading and compound disasters.
4. Develop a synthesis system under international cooperation to share integrated grass-root and scientific knowledge among a broad range of stakeholders and promote dialogue in the national platform.

Priority 2 – Disaster Risk Governance
5. Strengthen science-policy-practice nexus at all levels (national, local, trans-boundary and regional).
6. Develop inter-disciplinary national science and technology plans to support implementation of the Sendai Framework. This includes actions by academia/universities to develop their own disaster risk management plans.
7. Enhance collaboration between local governments, academia and other partners to promote local communities' knowledge and traditions and to sustain and replicate many good practices that exist locally for science-based decision making.

Priority 3 – Invest in DRR for Resilience
8. Make DRR an area of focus within education including networking between universities.
9. Ensure risk-sensitive investments through enhanced role of the science and technology community.
10. Develop young professionals in the field of multi-disciplinary disaster risk reduction.
11. Enhance and showcase projects that promote science and technology-based DRR and encourage governmental and social investment in disaster risk reduction.

Priority 4 – Enhance disaster preparedness for effective response and to Build Back Better
12. Promote the role of multi-disciplinary science and technology in effective pre- disaster planning, preparedness, response, rehabilitation, recovery and reconstruction to build back better
13. Develop an efficient and effective cooperation among the science community and business sector by utilizing the advancements of the fast developing information and communication technology (ICT) including big data.
14. Research into innovative and practical solutions to promote the whole-of-society engagement.
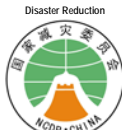
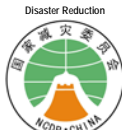|				
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Proposals for Science and Technology-based DRR

We acknowledge that: all experts and scholars engaged in science and technology-based DRR should commit to the four priorities enacted by SFDRR and each country' (region') DRR goals, implement the priority actions identified in the 2nd ASTCDRR, develop targeted science and technology, support the national platform, strengthen our inclusion in policy-making, and pro-actively contribute to the development of resilient society and communities. The United Nations and governments at all levels should fully support innovative development of science and technology-based DRR and DRR science and technology innovations in natural, social, economic, medical, engineering and other fields to advance the gradual implementation of Sendai Framework.

1. **Strengthening the trans-disciplinary research and development on disaster risk science, technology and policy:** we should further promote our understanding on the mechanism and process of disaster risk formation in various temporal-spatial scales, explore systemic risk assessment models for multi-hazard, disaster chain and disaster compound, and strengthen the research of integrated disaster reduction and risk governance policy and legislation system. There is an urgent need to develop space technology-based disaster monitoring and assessment technologies, innovate high-precision disaster forecasting, early warning, and emergency response technologies, innovate engineering and non-engineering prevention technology systems, develop various types of low-cost disaster reduction equipment and products, and develop efficient medical care technologies systems. Research and develop technologies for disaster insurance underwriting, loss adjustment, and indemnification, technologies for multi-scale and high-precision disaster risk mapping techniques, as well as technologies for rapid evacuation, relocation and better recovery.

2. **Enhancing the inclusion of science and technology groups in DRR activities**: Share synthesized scientific knowledge on DRR and promote dialogue among all stakeholders of the national platform. Mobilize all types of DRR-related research and development groups to actively participate in regional, national and international integrated DRR actions. Establish effective evaluation system and incentive mechanisms at group and individual levels to promote the involvement of science and technology groups in DRR activities. Strengthen cooperation between disaster reduction science and technology groups and educational institutions, promote the popularization and dissemination of disaster reduction knowledge and self and mutual rescue skills, and foster education resources on DRR. Strengthen the communication and cooperation between the science and technology groups and governments, communities and other stakeholders to promote the transformation, popularization and application of the scientific and technological achievements of DRR.

3. **Accelerating the initiatives of multi-disciplinary flagship programs of S&T based DRR:** Science and technology group should summarize, refine and share experiences of effective DRR practices at the community, region, country and international levels by different economic, political, cultural, social and ecological environment, in order to form new integrated risk governance paradigms in the context of global changes and disaster risk trends. We need to actively promote various types of effective S&T based DRR paradigms in communities, regions, and countries (regions) with different disaster risks, and initiate a set of engineering and non-engineering demonstration programs of S&T based DRR. With the help of the modern communication and computer techniques, accelerate the sharing of practical and advanced S&T-based DRR experience, cases, and successful paradigms.

4. **Increasing the investment from governments, societies and other stakeholders to the research, capacity building and development of DRR Science and Technology:** The scientific and technological innovation of DRR requires extensive attention and input from governments at all levels and society. The following items should be prioritized for the input to DRR S&T: building scientific and technological R&D institutions, improving research and development environment, and increasing the resources available for researchers, especially for young researchers/early career researchers. The focus of input should include the construction of disaster information sharing system, the establishment of technology development centres and incubators, and the implementation of science and technology based DRR demonstration programs. We need a good environment to foster a large number of experts for DRR science and technology innovations, entrepreneurs who promote the DRR technology, as well as practitioners and professionals for DRR science and technologies applications.

5. **Increasing the support of governments, societies, and other stakeholders for innovations and partnership development:** Governments at all levels, all sectors of society, and other stakeholders should strongly support the establishment of S&T institutions, development of DRR disciplines, and profession training agencies, in order to cultivate experts and professionals, which include supporting the creation of DRR technology enterprises, promoting the research and development of DRR technology, optimizing the national (regional) and international DRR technology standards to facilitate the application of advanced technology, supporting the establishment of non-profit DRR technology service systems to boost the sharing of disaster risk information. By comprehensively improve the legislation, institution, and mechanism for scientific and technological innovations, to foster the DRR culture of productivity protection by science and technology.

6. **Increasing the support of government, societies, and other stakeholders for the international cooperation and exchange on science and technology-based DRR:** Governments at all levels, societies, and other stakeholders should promote the sharing of advanced DRR technology by various forms of international collaboration and exchange activities, which including the collaboration of Asian regions on rapid loss assessment, comprehensive loss assessment, and recovery and reconstruction demand assessment, joint efforts on disaster survey in high risk regions, community disaster risk assessment and mapping with high-accuracy and high-resolution, establishment of Asian regional disaster risk assessment standards and the remote-sensing database system, regional and sub-regional platforms for DRR technology sharing, and joint expert panels of loss assessment for major natural disaster, thus to holistically improve the science and technology capacity for DRR in Asia. Each country is encouraged to contribute to the online synthesis system, developed under action 4 above, and link the system to different stakeholders in the national platform.

All participants from the Second Asian Science and Technology Conference for Disaster Risk Deduction,
held on 17-18 April 2018 in Beijing, China

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Appendix I

The twelve actions identified in the First Asian Science and Technology Conference for Disaster Risk Deduction in 2016

Priority 1 – Understanding Disaster Risk

1. Enhance disaster loss and damage accounting, national and local disaster risk assessment and communication of disaster risk, with a specific focus on urban risks.
2. Use space and disaster risk mapping technologies and strengthen the capacity for using these technologies for improved understanding of disaster risks at global, national and local level.
3. Strengthen regional exchange on disaster risk information and science in order to better understand complex disaster risks including risks of trans-boundary, cascading and compound disasters.

Priority 2 – Disaster Risk Governance

4. Strengthen science-policy-practice nexus at all levels (national, local, trans-boundary and regional).
5. Develop inter-disciplinary national science and technology plans to support implementation of the Sendai Framework. This includes actions by academia/universities to develop their own disaster risk management plans.
6. Enhance collaboration between local governments, academia and other partners to promote local communities'' knowledge and traditions and to sustain and replicate many good practices that exist locally for science-based decision making.

Priority 3 – Invest in DRR for Resilience

7. Make DRR an area of focus within education including networking between universities.
8. Ensure risk-sensitive investments through enhanced role of the science and technology community.
9. Develop young professionals in the field of multi-disciplinary disaster risk reduction.

Priority 4 – Enhance disaster preparedness for effective response and to Build Back Better

10. Promote the role of inter-disciplinary science and technology in effective pre- disaster planning, preparedness, response, rehabilitation, recovery and reconstruction to build back better.
11. Develop an efficient and effective cooperation among the science community and business sector by utilizing the advancements of the fast developing information and communication technology (ICT) including big data.
12. Research into innovative solutions to promote the whole-of-society engagement.