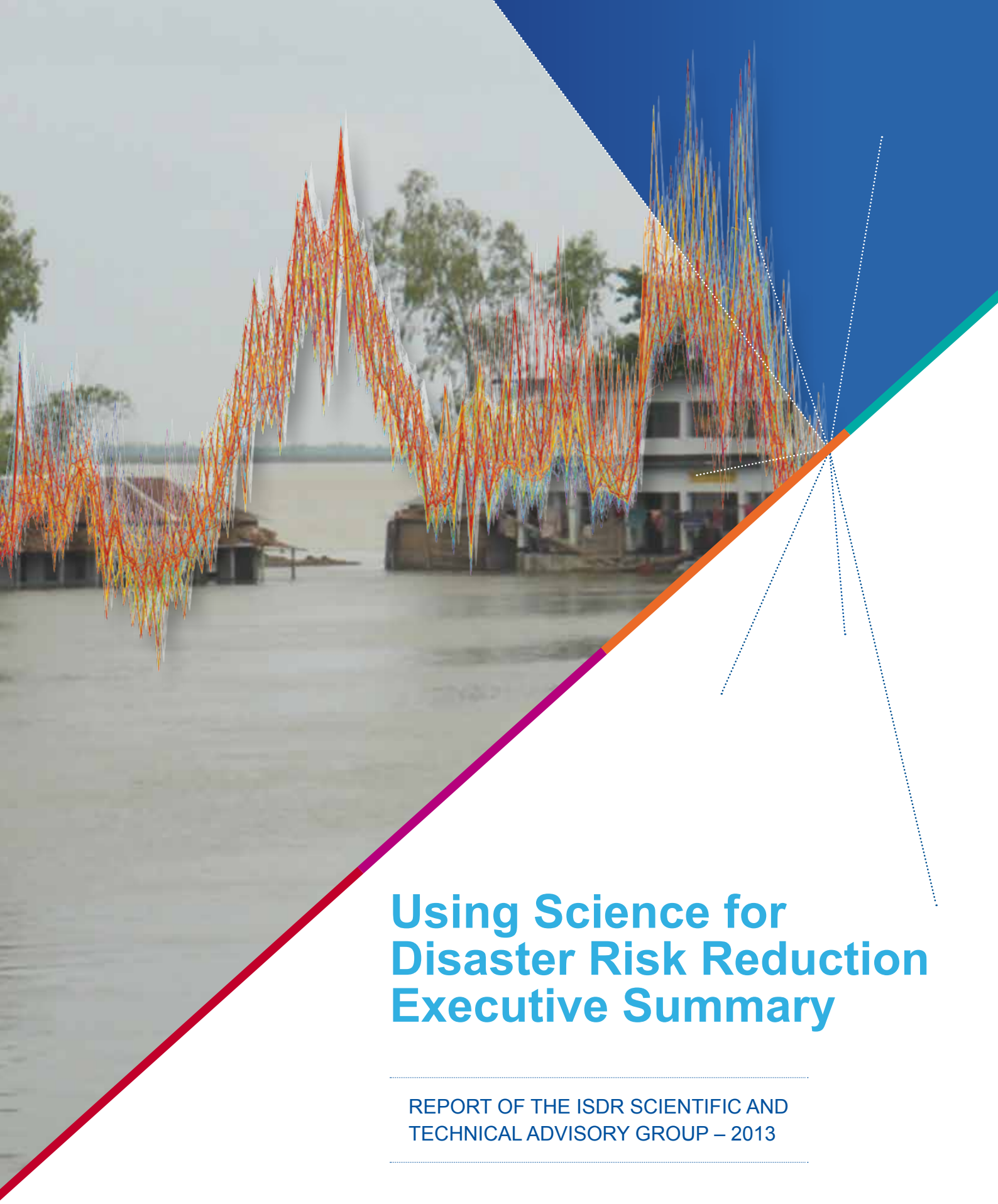

Using Science for Disaster Risk Reduction Executive Summary

REPORT OF THE ISDR SCIENTIFIC AND TECHNICAL ADVISORY GROUP – 2013

UNISDR
The United Nations Office for Disaster Risk Reduction

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EXECUTIVE SUMMARY

Disasters destroy lives and livelihoods around the world. Between 2000 and 2012, 1.7 million people died in disasters and an estimated US$ 1.7 trillion of damage was sustained[1]. Disaster risk reduction activities aim to reduce the human, economic and environmental costs of such disasters and science can play an essential role in these efforts, uncovering new ways to prevent, prepare for and respond to disasters and determining which technologies are most effective in reducing disaster risk. As a result of scientific research, across the world there are now programmes to forecast floods, detect tsunami waves, prevent infectious disease outbreaks with vaccination and effectively communicate disaster risk to enhance community resilience.

Thus science is already helping to save lives and livelihoods in some instances. But what do we mean by 'science'? Science is knowledge obtained through study or practice[2]. For disaster risk reduction, science is considered in its widest sense to include the natural, environmental, social, economic, health and engineering sciences, and scientific capacities are interpreted broadly to include all relevant resources and skills of a scientific and technical nature[3].

The more widespread integration of science into disaster risk reduction policy-making will depend on science being 'useful, useable and used'[4]. The International Strategy for Disaster Reduction (ISDR) Scientific and Technical Committee's 2009 report 'Reducing Disaster Risks through Science: Issues and Action'[5] discussed how the challenge of integrating scientific learning into policy can be overcome through improved dialogue between scientists and decision-makers, making the case that science can be made *useful* for disaster risk reduction. The case studies in this report describe specific examples of scientific learning being employed to enhance disaster risk reduction, providing ample evidence that science is *useable* for disaster risk reduction. By 2015, the ISDR Scientific and Technical Advisory Group aims to show that science is consistently *used* in disaster risk reduction.

Case studies capture the complexity of disaster risk by exploring the detail of a real-life situation. Individually they identify specific lessons for success in risk reduction; together they demonstrate common over-arching principles, which can be seen running through each study[6]. The case studies in this report were selected from across the breadth of scientific disciplines and from all parts of the globe. They demonstrate that science can:

- be driven by the need to address the adverse effects of disasters on lives, livelihoods, economies and societies
- enable more focused disaster risk assessment
- reduce the impact of disasters by better forecasting
- improve disaster risk mitigation programmes

1 UNISDR. Disaster Impacts/2000-2012. Available at: http://www.preventionweb.net/files/31737_20130312disaster20002012copy.pdf [accessed 02 April 2013].
2 Webster's New World College Dictionary, 4th Edition. Foster City: John Wiley & Sons Inc, 1999.
3 Reid B. Science and Technology and Disaster Risk Reduction: A review of application and co-ordination needs. Geneva: UNISDR, 2013. Available at: http://www.preventionweb.net/posthfa/documents/Science-and-Technology-for-Disaster-Risk-Reduction.pdf [accessed 25 April 2013].
4 Boaz A, Hayden C. Pro-Active Evaluators: Enabling Research to be Useful, Usable and Used. Evaluation.2002; 8(4):44053.
5 UNISDR. Reducing Disaster Risks through Science: Issues and Actions, The full report of the ISDR Scientific and Technical Committee 2009. Geneva: UNISDR, 2009. Available at: http://www.unisdr.org/files/11543_STCReportlibrary.pdf [accessed 8 April 2013].
6 Grynszpan D, Murray V, Llosa S. The value of case studies in disaster assessment. Prehospital and Disaster Medicine. 2011; doi:10.1017/S1049023X11006406.

These case studies across identified some common themes for success, including community participation in the development of scientific interventions, clear leadership and high-level commitment to implement and sustain interventions in the long term.

Further case studies will be collected and made available by the Scientific and Technical Advisory Group, accessible via www.unisdr.org and www.preventionweb.net We encourage scientists and implementers to submit their own case study examples demonstrating the use of science in disaster risk reduction activity. Information on how to prepare and submit case studies can be found on the website.

Looking to the future, the need to achieve more effective interplay of science, policy and practice in support of disaster risk reduction provides a great opportunity for collaborative learning and action. The science community should find better and faster ways to interact with and to communicate findings to policy makers. For instance, forecasting is already well-developed for some hazards and is expected to improve greatly in the coming decades[7] but the meaning of and uncertainty within forecasts needs careful communication by scientists if policy-makers are to use them to full effect.

Research agendas should be developed in cooperation with all stakeholders, so that scientists' work is focussed on solutions to the challenges faced now, and in the future, by policy-makers and implementers. This applies to research throughout the whole risk reduction cycle: through prevention, prediction and early detection to response and recovery. Specific areas for further collaborative work include the disaster risk reduction needs of women who manage households and care for family members, which limits their mobility and increases their vulnerability to disasters; how to mitigate against disasters in settlements with little economic diversification, where most income comes from climatesensitive primary resource industries such as agriculture, forestry, and fisheries; and how to promote sustainable recovery, including both structural and non-structural mitigation measures that will lower the risk of future disasters.

The Scientific and Technical Advisory Group makes the following recommendations:

Encourage science to demonstrate that it can inform policy and practice

Through the use of case studies this report demonstrates that science can identify a problem, develop understanding from research, inform policy and practice and make a difference that can be objectively demonstrated when evaluated. The Report, and the associated website, offers tools to promote this sharing of information and thus provide knowledge transfer to policy-makers and other disaster risk reduction partners

Use a problem-solving approach to research that integrates all hazards and disciplines

An all-hazard, risk-based, problem-solving approach should be used in disaster risk reduction research to address the multifactorial and interdependent nature of the disaster risk chain and to achieve improved solutions and better-optimized use of resources. This requires collaboration and communication across the scientific dis-

7 Foresight. Reducing Risks of Future Disasters: Priorities for Decision Makers. London: UK Government Office for Science, 2012.

ciplines and with all stakeholders, including representatives of governmental institutions, scientific and technical specialists and members of the communities at risk to guide scientific research, set research agendas, bridge the various gaps between risks and between stakeholders, and support scientific education and training.

Promote knowledge into action

Greater priority should be put on sharing and disseminating scientific information and translating it into practical methods that can readily be integrated into policies, regulations and implementation plans concerning disaster risk reduction. Education on all levels, comprehensive knowledge management, and involvement of science in public awareness-raising, media communication and education campaigns should be strengthened. Specific innovations should be developed to facilitate the incorporation of science inputs in policymaking.

Science should be key to the Post-2015 Hyogo Framework for Action

The Scientific and Technical Advisory Group considers it essential to demonstrate, by 2015, that science is routinely used to inform disaster risk reduction and therefore holds a key place in the Post-2015 Hyogo Framework for Action. The Group calls for all scientists to provide evidence of impact by clearly stating how science has responded to a problem, what scientific learning was identified, how their findings were applied to policy and practice and that it makes a difference on implementation.

The Chair's summary from the 2011 Global Platform stated: "the choice before us as Governments, institutions, communities and individuals is to place disaster risk reduction at the forefront of our efforts to preserve and protect the balance of nature, ensure sustainable development and wellbeing for generations to come" and that to do this there is the opportunity to *"actively engage scientific and technical communities to inform decision-making"* [8]. We support and endorse this view which must be fundamental to the 'Hyogo Framework for Action 2', the post-2015 framework for disaster risk reduction.

8 UNISDR. Chair's Summary of the Third Session of the Global Platform for Disaster Risk Reduction and World Reconstruction Conference Geneva, 8-13 May 2011 "Invest today for a Safer Tomorrow – Increase Investment in Local Action". 2011. Available at: http://www.preventionweb.net/files/20102_gp2011chairssummary.pdf [accessed 8 April 2013].

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