

STATEMENT

Advancing Science for Disaster Risk Reduction Towards 2030 and Beyond

Whereas,

- The first quarter of the 21st century was characterized by a significant number of disasters due to natural hazard events, causing hundreds of thousands of casualties, displacing millions of people, and resulting in extensive infrastructure damage;
- The year 2026 alone has been notable for disasters across multiple regions on the globe triggered by single, cascading or compound natural hazard events, such as earthquakes, landslides, floods, storms, typhoons, tornados, extreme heat waves, droughts, and wildfires; the disasters are resulted in significant human, economic and financial losses (e.g., ^{1,2,3,4,5,6})

The International Scientific Programme on *Integrated Research on Disaster Risk* (IRDR)

Expresses deep heartfelt condolence and sympathy for the victims and sufferers of the disasters happened; and

Considering that

- The number of fatalities and people affected, as well as the property damage caused by natural hazard events, do not yet correspond to the official metrics of the UNDRR Sendai Framework Monitor; namely, although average disaster-related mortality declined by 49% during 2014–2023 compared with 2005–2014, the number of people affected by disasters increased by 71% over the same period⁷;
- Disasters caused by natural hazards during the first half of 2026 resulted in more than US\$112 billion in economic losses⁸;

¹ Swiss Re, 2026. First-half 2026 insured natural catastrophe losses: below trend, rising risks. <https://www.swissre.com/institute/research/topics-and-risk-dialogues/climate-and-natural-catastrophe-risk/first-half-2026-insured-catastrophe-losses.html>

² Triodos Bank, 2026. Europe's extreme heat could wipe out EU growth in 2026. <https://www.triodos.com/en/press-releases/2026/europes-extreme-heat-could-wipe-out-eu-growth-in-2026>

³ Gilbert, S., 2026. Where the world is burning in 2026. <https://www.visualcapitalist.com/where-the-world-is-burning-in-2026>

⁴ Al Jazeera, 2026. India's severe monsoon season causes more than 100 deaths since July. <https://www.aljazeera.com/news/2026/8/5/indias-severe-monsoon-season-causes-more-than-100-deaths-since-july>.

⁵ The Times of India, 2026. Floods in India. <https://timesofindia.indiatimes.com/topic/floods-in-india/news>

⁶ TropicalHainan, 2026. Hainan Typhoon Advisory Update. <https://www.tropicalhainan.com/hainan-typhoon-advisory-update-maysak-brings-ferry-suspensions-rail-disruption-and-heavy-rain>

⁷ UNDRR, 2024. UNDRR Sendai Framework Monitor: Decrease in global disaster mortality, rise in affected populations. <https://www.undrr.org/news/undrr-sendai-framework-monitor-decrease-global-disaster-mortality-rise-affected-populations>

⁸ MunichRe, 2026. The natural disaster H1 2026 loss numbers are in. But what do they mean for your portfolio? <https://www.munichre.com/rmp/en/the-re-brief/risk-management/the-natural-disaster-h1-2026-loss-numbers-are-in-but-what-do-they-mean-for-your-portfolio.html>

- Record-breaking heatwaves in Europe and North America as well as wildfires in Africa, Australia and elsewhere, most likely exacerbated by climate change, have put people at risk and slowed economic activity⁸; and

Recognizing that

- Vulnerability and exposure to natural hazards are key determinants of disaster risk and the main drivers of disaster losses^{9,10}
- Disaster impacts are influenced not only by hazards themselves, but essentially by underlying social, economic, and institutional inequalities shaping vulnerability, exposure, and recovery capacity^{11,12};
- The academics, civil society, and disaster risk authorities, acting individually, cannot significantly reduce the risks associated with natural hazards; and only co-designed, integrated, and collaborative research on disaster risk can contribute to the generation of knowledge about disaster risk reduction and support informed decision-making at the local, national, regional, and global levels;
- No one should wait until disasters strike to act; rather, preventive measures should be developed, risk communication and public awareness should be improved, and other disaster risk prevention and management measures should be strengthened; disaster risk and crisis management, as well as early warning systems and anticipatory actions, require better planning; collaboration across sciences and across relevant sectors should be improved;
- Disaster impacts may be substantially reduced by strengthening disaster risk reduction products and processes within countries, institutions, and vulnerable communities¹³;
- Changes in environmental conditions, including climate change, significantly influence the severity and frequency of natural hazards and their consequences, while physical, social, economic, and other forms of vulnerability are increasing worldwide and generating cascading and systemic impacts;
- Reducing the impact of disasters should be pursued primarily at the local and national levels, through co-creation and co-production processes;
- Growing interactions among natural hazards, climate change, displacement, and human mobility are increasingly shaping disaster risk and resilience outcomes in many regions; and

Noting that

- Modern technologies, including artificial intelligence, enable detailed Earth observations – both space-based and in situ – before, during, and after natural hazard events; such technologies can also provide disaster management authorities and rescue agencies with immediate quantitative estimates of the extent and severity of disasters in their aftermath;
- Natural hazard risk forecasting models can improve predictions of potential disasters and thereby contribute to preventing loss of life, provided that predictions are timely and warnings are heeded; reducing predictive uncertainty therefore remains one of the most important scientific priorities for disaster risk reduction;

⁹ Cardona O, Van Aalst M, Birkmann J et al (2012) Determinants of risk: exposure and vulnerability. In: Field C, Barros V, Stocker T, Dahe Q (eds) Managing the risks of extreme events and disasters to advance climate change adaptation: special report of the intergovernmental panel on climate change. Cambridge University Press, Cambridge, pp 65–108.

¹⁰ Ismail-Zadeh, A. (2022). Natural hazards and climate change are not drivers of disasters. *Nat. Hazards*, 111, 2147–2154. <https://doi.org/10.1007/s11069-021-05100-1>

¹¹ Cutter, S., Boruff, B.J., Shirley, W.L. (2003). Social vulnerability to environmental hazards. *Soc Sci Q*, 84, 242–261.

¹² IPCC (2022). *Climate Change 2022: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report. Cambridge University Press. <https://doi.org/10.1017/9781009325844>

¹³ IRDR, 2025. Disaster risk reduction products and processes: Knowledge sharing for place- and context- specific action. https://www.irdrinternational.org/knowledge_pool/publications/131

- The transboundary nature of cascading, compound hazards requires urgent actions for integrated research on disaster risks;
- Even outstanding knowledge of disaster risks is of limited value in reducing risks and disaster impacts unless such knowledge is translated into practice;
- The economic impact of disasters caused by natural hazards exceeds the cost of preparedness and mitigation;
- Recovery and reconstruction processes contribute to long-term sustainability and adaptation;

Encourages the IRDR community

- To contribute to accelerating the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR) through the *Framework for Global Science in Support of Risk-informed Sustainable Development and Planetary Health*¹⁴, towards 2030 and beyond, and to develop comprehensive evaluation tools for measuring the implementations of the SFDRR;
- To extend the role of IRDR International Centres of Excellence to knowledge exchange on disaster risks to provide high-quality scientific evidence for informed decision-making, foster the use of disaster diplomacy to inform effective planning and decision making for risk reduction, and ensure that relevant knowledge, including local and traditional, reaches the diverse range of people who need it¹⁵;
- To develop interdisciplinary and multinational research programs, projects, and networks on natural hazards and risks to improve understanding of disaster risks; particularly, research and monitoring on complex natural hazard and their impacts, ecosystem resilience, and community-based preparedness and adaptation strategies should be strengthened;
- To promote the operationalization of models into decision-support tools, that is, the conversion of research models into practical disaster risk reduction tools and products for local planners and responders;
- To contribute to enhancing multi-hazard early warning systems by scientific support to four pillars of Early Warning for All Initiative¹⁶ to ensure that warnings are impact-based, actionable, context-specific, locally relevant, and leave no one behind;
- To promote the establishment of national and regional living labs to facilitate co-designed and co-produced research, tools, and products¹³ involving researchers, local communities, and other disaster risk reduction stakeholders, and to address transboundary disaster risks more effectively;
- To foster science-to-policy mechanisms through the appointment of disaster risk reduction science advisers and/or the establishment of local advisory boards on disaster risk reduction¹³;
- To strengthen capacity building and knowledge dialogue through sustained interdisciplinary collaboration, long-term training and mentoring, and active engagement among scientists, policymakers, practitioners, and local communities; and

Calls for

- Promoting integrated studies on complex, cascading, and compounding hazards and risks, including their interdependencies;
- Ensuring the consistency and comparability of data on disaster losses, both human and economic, and damage patterns, especially for less-studied regions;

¹⁴ IRDR, 2021. A Framework for Global Science in Support of Risk-Informed Sustainable Development and Planetary Health. https://irdrinternational.org/knowledge_pool/publications/91

¹⁵ Kontar, Y.Y.; Ismail-Zadeh, A.; Berkman, P.A. et al., 2021. Knowledge exchange through science diplomacy to assist disaster risk reduction. *Progress in disaster science*, 11, Article no: 100188. <https://www.sciencedirect.com/science/article/pii/S259006172100048X>

¹⁶ UNDRR, 2022. Early Warnings for All. <https://www.undrr.org/fr/node/75456>

- Integrating artificial intelligence into disaster scenario simulations, disaster loss assessments, response prioritization, and vulnerability forecasting;
- Employing emerging technologies and digital tools, such as drones, digital twins, and remote sensing for real-time monitoring of hazards and their impacts;
- Addressing the vulnerabilities of the most disadvantaged and marginalised people and communities and embedding vulnerabilities into anticipatory actions and risk-informed development strategies;
- Promoting disaster risk management upstream by taking actions before a disaster fully unfolds, based on forecasts, including anticipatory financing, extreme-event forecasting, early warnings, preparedness, and public awareness;
- Integrating changing climatic patterns, such as extreme rainfall, wildfires, heatwaves, sea level rise, shifting hazard zones, with natural hazards patterns and trends in rapid urbanization and population growth, as well as the impact of poverty, marginalization, and inequality;
- Sharing the critical information on disaster risk reduction to the greatest extent possible with government officials, emergency planners, the insurance industry, policymakers, and the public;
- Developing a multi-way disaster risk communication encompassing all relevant stakeholders involved in risk management; and
- Preparing future researchers and practitioners in disaster risk reduction and climate change adaptation through inter- and transdisciplinary training that integrates critical thinking and co-learning with communities and practitioners.

Integrated Research on Disaster Risk (IRDR) is an international scientific programme that aims to usher in an inclusive, safe and sustainable world by promoting a better understanding of disaster risk and the effective use of risk science in decision-making. IRDR is co-sponsored by the International Science Council (ISC) and the United Nations Office for Disaster Risk Reduction (UNDRR) and supported by the China Association of Science and Technology (CAST). <https://irdrinternational.org>