



Invited perspectives: Challenges and step changes for natural hazards - perspectives from the German Committee for Disaster Reduction (DKKV)

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1 The German Committee for Disaster Reduction | Deutsches Komitee für Katastrophenvorsorge e.V.

10 DKKV is the largest platform for disaster risk reduction in Germany and has been promoting prevention and disaster risk reduction in science, practice and in politics since the beginning of the International Decade for Natural Disaster Reduction in 1990. The overarching leitmotiv of DKKV is the strengthening of societal resilience and fostering the exchange and knowledge transfer between research, operative actions, the policy level and the public. DKKV acts as an umbrella organization for German institutions and experts in the field of disaster risk reduction and functions as an intermediary to national and international networks and initiatives. Students and recent graduates are involved in the network and can actively participate in DKKV activities for a reduced membership fee. We hereby aim to empower the Young Professionals and invite them to contribute to disaster risk reduction through the use of science, engineering, technology, and innovation through participation.

20 DKKV is active in three fields, i.e., (1) networking and fostering exchange between experts from science, practice, administration, and politics; (2) consulting of decision-makers to provide best-practices and actionable advice to stakeholders; and (3) knowledge management and transfer addressing civil society and the public to promote prevention measures. DKKV is an active member of national and international networks, e.g., it acts as the national focal point for IRDR (Integrated Research on Disaster Risk) and GNDR (Global Network of Civil Society Organisations for Disaster Reduction), is observer organisation for UNFCCC (United Nations Framework Convention on Climate Change), is active member of E-STAG (European Science and Technology Advisory Group), and contributes to networks such as Risk KAN (Knowledge Action Network on Emergent Risks and Extreme Events) and DERN (Disaster and Emergency Research Network). DKKV frequently takes part in research projects such as MATRIX (FP7), ESPRESSO (H2020), and PLACARD (H2020).



2 Challenges for future research and resilience building

30 The worldwide challenge of the present as well as the future is to navigate the global community to a sustainable and secure future. Humanity will increasingly face multiple risks under more challenging conditions. The continuation of climate change and the ever more frequent occurrence of extreme, multi-hazard, and cascading events are interacting with increasingly complex and interconnected societies. Natural and technological hazards leading to economic and non-economic losses call for further research to assist policy makers and public administration with evidence-based, precautionary and actionable information and advice. It is therefore important for research to focus more on overarching and synergetic approaches, such as integrating disaster risk reduction (DRR), climate change adaptation (CCA) and complexity science to foster resilience. The strengthening of resilience, i.e. a system's (i) absorptive, (ii) adaptive, (iii) anticipative, (iv) preventive, and (v) transformative capacities to respond to risks and crises (UNDP, 2020) is at the core of key international frameworks such as the Sustainable Development Goals (SDGs) (United Nations, 2015b), the Paris Agreement on Climate Change (United Nations, 2015a), the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR) (UNDRR, 2015), and the New Urban Agenda (UN Habitat, 2016). Consequently, the scientific community needs to focus present and future research on addressing natural hazard related challenges to meet the priorities of these international agreements.

3 Step changes and research needs according to the priorities of the SFDRR

45 Targeting the Sendai priorities, a vision paper (Zuccaro et al., 2018) put forward as a main outcome of the ESPREsSO project (www.espressoproject.eu) and identified research needs and emerging cross-cutting issues for future research in DRR and CCA. This is also in line with the upcoming IRDR Research Agenda for Global Science in Support of Risk-Informed Sustainable Development and Planetary Health (IRDR International Conference 2021). Several step changes in terms of improved understanding of disaster risk emerge. As risk is composed of the elements of hazard, vulnerability, and exposure, an interdisciplinary research with a systemic and integrative perspective is needed. In this regard, scientifically addressing all elements of risk is fully consistent with the societal need for improved risk and impact assessments as well as improved data for decision-making on a resilient future. Improved data entails both harmonized data and its effective management and continuous updating. These are fundamental for more detailed and advanced simulations and assessments. Based on co-creation of knowledge with all involved actors and communities can increase the overall awareness and preparedness to risk through efficient communication and dissemination platforms. A multi-level approach and data-driven decision-making process is needed to further strengthen risk governance to manage disaster risk. This implies the effective implementation of community governance with continuous consultation with impacted communities at the local, national, and international level. Moreover, at the policy level, existing synergies between DRR, CCA, and SDGs should be enhanced and expanded, with the aim to improve the legal framework for sustainable and holistic decision-making. This applies to all components of the disaster risk management cycle. Equally important is an international transboundary cooperation for long-term joint



60 preparedness, adaptation, and mitigation of risk. The same applies to joint emergency management, response coordination
and a sustained recovery.

In this regard, enhanced partnerships and improved legal frameworks, procedures, and tools represent an important step
change for knowledge-based decision-making. An additional step change must be geared toward investing in DRR for
resilience. Due to the multiple emerging risk conditions societies are facing, it is crucial to overcome the implementation gap
65 in DRR and CCA in order to strengthen resilience. Best-practices tested through community action in DRR and CCA need
greater national and international visibility through more effective dissemination and application. Investing in scientific
research and production of knowledge on natural hazards, vulnerabilities, and exposure will help anticipate and better
prepare for increased risk situations and increase resilience. This is fully consistent with enhancing disaster preparedness for
effective response and to “Build Back Better” in recovery, rehabilitation, and reconstruction.

70 To optimize the available resources in an integrative way, a widespread adoption of “Build Back Better” principles is
essential, to allow greater flexibility of measures and actions for DRR and CCA. Furthermore, early warning systems need a
step change, both technologically and organizationally, to enhance disaster preparedness. Communication with the public
represents a crucial factor, which needs to be improved, considering societal values and human behaviours while protecting
vulnerable communities and ensuring the transparency in decision-making.

75 As climate change and disasters do not respect political borders, developing transboundary international coordination and
cooperation mechanisms that take into account emerging risks increases the overall resilience.

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