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Systemic risk from the perspective of climate, environmental and disaster risk science and practice

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Understanding and managing systemic risk is more important than ever due to our immense global connectivity (e.g., between sectors, such as food-health-water-energy, countries and continents, down to individuals). Despite the fact that the notion of systemic risk is several decades old, the term is used in diverse ways across different disciplines (e.g., financial systems, medicine, earth system sciences, disaster risk research and climate science). Triggered by the repercussions of the global financial crisis of the late 2000s, and more recently the COVID-19 pandemic, which are clear realization of systemic risk, the perception of systemic risk has often been focused on global and catastrophic or even existential risks. Systemic risk, however, can be seen as a feature of systems at all possible scales (e.g., global, national, regional, local) with system boundaries varying depending on the context.

Addressing current societal challenges, such as climate change, in terms of systemic risk requires integrating different systems perspectives and fostering system thinking, while implementing key intergovernmental agendas, such as the Paris Agreement, the Sendai Framework for Disaster Risk Reduction and the Sustainable Development Goals.

Based on insights gained and knowledge collected from an expert workshop, literature review and expert elicitation, we give an integrated perspective of climate, environmental and disaster risk science and practice on systemic risk as summarized in a Briefing Note to the International Science Council. We provide an overview of concepts of systemic risk that have evolved over time and identify commonalities across terminologies and perspectives associated with systemic risk used

in different contexts. Key attributes of systemic risk are outlined without prescribing a single definition, and information and data requirements are discussed that are essential for a better and more actionable understanding of the systemic nature of risk. Finally, the opportunities to connect research and policy for addressing systemic risk are highlighted.