United Nations Development Programme

# DISCUSSION PAPER

## *The Social Construction of Systemic Risk: Towards an Actionable Framework for Risk Governance*

June 2021

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# ABBREVIATIONS

| | |
|---|---|
| AAL | Average Annual Loss |
| ASBP | Aral Sea Basin Program |
| CDRI | Coalition for Disaster Resilient Infrastructure |
| CCRI | Coalition for Climate Resilient Investment |
| CCRIF | Caribbean Catastrophe Risk *Insurance* Facility |
| CREAD | Climate Resilience Execution Agency of Dominica |
| CPP | The Cyclone Preparedness Programme, Bangladesh |
| ECLA | Economic Commission for Latin America |
| FDI | Foreign Direct Investment |
| GAR | Global Assessment Report |
| GFDRR | Global Facility for Disaster Risk Reduction of the World Bank |
| GSPS | Growth and Social Protection Strategies in Dominica |
| ICAB | Interstate Council for the Aral Sea Basin |
| IFAS | International Fund to Save the Aral Sea |
| IPCC | Intergovernmental Panel on Climate Change |
| IRGC | International Risk Governance Council |
| LDC | Least Developed Country Category |
| LMIC | Low- and Middle-Income Countries |
| MPHSTF | Multi-Party Human Security Trust Fund in Uzbekistan |
| NDMA | National Disaster Management Authority |
| NRDS | National Resilient Development Strategy in Dominica |
| OECD | Organization for Economic Co-operation and Development |
| PCRIC | Pacific Catastrophe Risk Insurance Pilot - GFDRR |
| PML | Probable Maximum Loss |
| RMG | Ready-Made Garment Industry |
| SDG | Sustainable Development Goals |
| SFDRR | Sendai Framework for Disaster Risk Reduction |
| SIDS | Small-Island Developing States |
| SINIGERD | National Information System for Disaster Risk Management in Peru |
| SNET | National System for Territorial Studies in El Salvador |
| TFCD | Task Force for Climate-related Financial Disclosures |
| UNDP | United Nations Development Program |
| UNDRR | United Nations Office for Disaster Risk Reduction |

# GLOSSARY OF PRINCIPLE TERMS

The key process and management definitions used in this paper are as follows:

- **Conventional or idiosyncratic risk:** The probable direct impacts that can occur such as injury and death, loss or damage to physical assets and economic losses associated with existing stocks and provisions.
- ***Disaster Risk****: "The potential loss of life, injury, or destroyed or damaged assets which could occur to a* ***system****, society or a community in a specific period of time, determined probabilistically as a function of* ***hazard, exposure, vulnerability*** *and capacity".* (United Nations)
- **Extensive Risk:** The risk of low-severity, high-frequency hazardous events and disasters, mainly but not exclusively associated with highly localized hazards. Extensive disaster risk is usually high where communities are exposed to, and vulnerable to, recurring localized floods, landslides, storms or drought. Extensive disaster risk is often exacerbated by poverty, urbanization and environmental degradation. (UNDRR terminology)
- **Intensive Risk:** The risk of high-severity, mid- to low-frequency disasters, mainly associated with major hazards. (UNDRR terminology)
- **Resilience***: "The ability of individuals, households, communities, cities, institutions,* ***systems*** *and society to prevent, resist, absorb, adapt, respond and recover positively, efficiently and effectively when faced with a wide range of risks, while maintaining an acceptable level of functioning and without compromising long-term prospects for sustainable development, peace and security, human rights and well-being for all."* (United Nations, CEB).
- **Risk governance:** *"The actions, processes, traditions and institutions by which authority is exercised and decisions are taken and implemented. Risk governance applies the principles of good governance to the identification, assessment, management and communication of risks"* (IRGC). Disaster Risk Governance refers to the way in which the public authorities, civil servants, media, private sector, and civil society coordinate at community, national and regional levels in order to manage and reduce disaster and climate related risks. This means ensuring that sufficient levels of capacity and resources are made available to prevent, prepare for, manage and recover from disasters. It also entails mechanisms and processes for citizens to articulate their interests and exercise their legal rights and obligations. (UNDP Issue Brief, 2013).
- **Sequential, synchronous and simultaneous crisis***:* Sequential crisis has been used to refer to the impact of a hazard event in one system, that then produces cascading and non-linear impacts and ripple effects in other systems, which may be geographically and temporally discontinuous. Synchronous failures refer to breakdowns in multiple interlocking systems, which interact to generate compound impacts. Simultaneous crises refer to situations where different risks are realized simultaneously and produce a magnified impact in interconnected and interdependent systems that is greater than the sum of the parts (UNDRR, 2011).
- **Systemic**: An adjective: *"relating to or affecting the whole of a* ***system****, organization etc. rather than just some parts of it"* (Cambridge English Dictionary)
- **Systemic risk:** The ripple-effects of direct loss and damage, indirect impacts and wider effects, such as the disruption of infrastructure systems and essential services; failure of economic, financial or social systems; effects on employment and income; national and family debt profiles and ecosystem collapse.

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# EXECUTIVE SUMMARY

## *Introduction*

This document is a "thought piece" on systemic risk governance for the 21st century commissioned in January 2021 by the Disaster Risk Reduction and Recovery for Building Resilience Team (DRT) within the Crisis Bureau at United Nations Development Program (UNDP). It aims to contribute to the understanding and discussion of systemic risk and the actionable ways of promoting governance at local and national levels, while also offering a guide or path for promoting cross thematic (health, population migration, infrastructure, conflict, disaster risk management and climate change adaptation) collaboration within UNDP itself on risk reduction and prevention, and in its support to countries in their search for low risk, sustainable and resilient development. This study also contributes to the 2022 Global Assessment Report of the United Nations Office of Disaster Risk Reduction (UNDRR).

The paper examines systemic risk within the context of the Sendai Framework for Disaster Risk Reduction (SFDRR) adopted in 2015.The concept of disaster seen as a severe interruption of the routine functioning of a society, or economy, that condenses the risk accumulated in a system or systems is an appropriate frame for considering and studying systemic risk[1]. This is particularly so because the SFDRR encompassed a broader range of hazard events[2] than those previously considered to be components of risk or triggers of disaster and crisis, including physical (for examples, earthquakes, floods or drought), biological (for example, virus and other pathogens), technological (for example, a nuclear accident) and social and economic (for example, financial, crime, insolvency or price spikes).

For the *governance of systemic risk to be useful and effective*, it must be framed in a way that is understandable and actionable for national and local stakeholders. This a primary objective of the present paper.

The paper is based on an extensive review of the specialized literature on the theme and a generic analysis informed by five case studies that examine distinct aspects and expressions of systemic risk (Bangladesh, Colombia, Dominica, Uzbekistan and Zimbabwe). These case studies were developed through stakeholder consultations and review of relevant literature specific to risk contexts in the respective countries.

## *The Concept of Systemic Risk*

Since the turn of the century in particular, the term has been used to refer to physical, biological, social, environmental or technological hazard events triggering not only direct loss and damage but also spiraling, cascading or ripple effects within one or more interdependent social, economic or environmental systems, often associated with feedback loops and non-linear effects (IRGC, 2018; Renn, 2016; UNDRR, 2019).

Systemic risk has always existed. Local and national expressions of systemic risk, common throughout history, are now complemented by increasing manifestations of global systemic risk. Events since the turn of the 21st century would seem to indicate that the compression of time and space[3], as a defining characteristic of economic globalization, is consistent with increasing system interdependency, complexity and uncertainty and hence magnified systemic risk. A recent survey by the OECD highlighted that while many countries had strategies to manage risks in some critical infrastructure sectors, few map interdependencies across sectors and only half have the capacity to identify new, unforeseen and complex crisis (OECD, 2018).

The triggers of systemic risk and risk in general can be varied including those with physical, biological, technological, environmental, socio-political, and economic/financial origins. They may occur as single and separate occurrences or in more complex, compound, multiple, concatenated or cascading and sequential ways. Systemic risk, characterized by high levels of interdependency, non-linearity, feed-back loops and uncertainty may be expressed and realized as sequential, synchronous or simultaneous crises and failings.

To illustrate the differing possible expressions of systemic risk the paper analyzes the following types:

***Systemic risk in interdependent infrastructure systems:*** Systemic risk is not limited to single systems, but rather is associated with synchronous failures in multiple interdependent systems, associated with factors such as physical proximity, functional interdependence and economic integration. The impact of Hurricane Maria in Dominica and Hurricane Sandy on the New York metropolitan area are used to illustrate destruction and damage to assets and infrastructure and failure in diverse systems due to the primary impacts of the hurricanes.

***Systemic risk in global supply chains:*** The series of fires in the Bangladesh ready-made garment industries in 2012-13 triggered sequential impacts in geographically discontinuous regions of Europe and North America, transmitted through global supply chains. The risks associated with sequential failure have long been anticipated by the OECD (OECD, 2003) which stated "*If a system is assumed to be self-contained in space (physical or operational) and time, then it is likely the long-term consequences and impacts outside the system studied will be neglected. Only by understanding its complexities will it be possible to understand, and so be ready for, the long-term consequences of damage to a system – including the potential domino effect of harm to other systems*".

***Simultaneous crisis from compound hazards:*** Multiple hazards may also be associated with simultaneous crisis, where risk manifests in different systems at the same time, further magnifying and compounding the impacts, for example in Zimbabwe, Syria or Sudan (macro-economic crisis compounded by COVID-19, conflict-driven refugee crises, drought, floods, and epidemics).

***Existential risk in global systems:*** Nine critical and interdependent earth systems have been identified with thresholds or boundaries, that when breached represent existential risk. Non-linearity in these systems mean that small incremental changes in any one system may lead to a catastrophic breakdown in another. It is not only earth systems, however, that can potentially breakdown. Growing social and economic inequality at all scales, a generalized crisis of governance in many countries, difficulties to plan and manage urban growth and to provide land and essential services, point to the interdependence of social and economic systems with earth systems. Such interdependencies are well-illustrated in the case of the drying of the Aral Sea in Central Asia (Hoskins, 2014).

***The quotidian or every-day experience of systemic risk:*** Most people in LMIC experience systemic risk through the failure of local infrastructure systems, the interruption of local supply chains and the degradation or collapse of local ecosystem services, largely associated with extensive risk. Local infrastructure systems provide essential services, such as water and sanitation, power, telecommunications, health and education to urban centers and their economies. Local supply chains depend on road, rail, or river networks. Whereas in OECD countries (OECD, 2018), this problem is described as one of *significant pockets of vulnerability*, in LMIC it is a much more generalized challenge. In these countries it would be more appropriate to describe *significant pockets of resilience* against a general backdrop of vulnerability. Addressing the quotidian