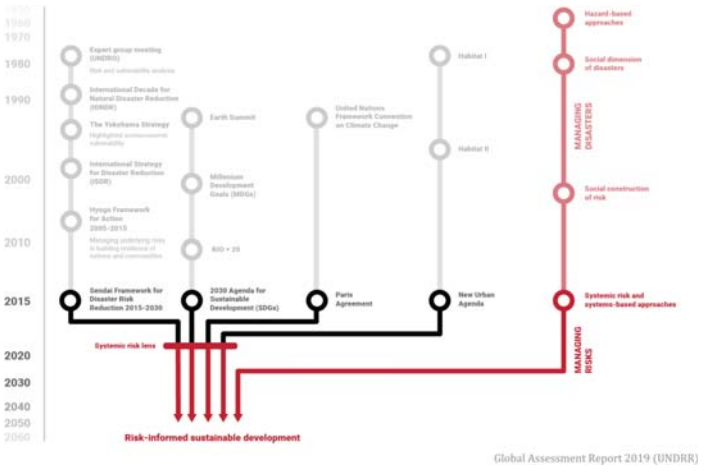
Guest editorial

As presented in the "UN Global Assessment Report on Disaster Risk Reduction 2019" (GAR 2019)[1], extreme changes in ecological and social systems are happening now, across multiple dimensions and scales more quickly and surprisingly than we ever thought possible. Non-linear, systemic change is a reality, and new risks and correlations are emerging in ways that we have not anticipated. Cost estimates of unmitigated climate change for instance, are now considered "potentially infinite"[2]. Threats that were once considered inconceivable, no longer are.

Risks generated by the interaction of complex human and natural systems, amplified by changes in the climate, are increasing the propensity for systems reverberations, setting up feedback loops with cascading consequences that are larger, more complex and more difficult to foresee – undermining, and potentially reversing efforts to achieve the "2030 Agenda for Sustainable Development" (2030 Agenda).

The "Sendai Framework for Disaster Risk Reduction 2015-2030" (Sendai Framework) reflects the certainty that in an ever more populous, networked and globalising society, the very nature and scale of risk has changed, to such a degree that it surpasses established risk management institutions and approaches. Recent events – such as large-scale prolonged droughts and heatwaves, financial and commodity market crashes, large scale and long-term human migration, cyber vulnerabilities and political upheavals – carry the potential to generate diverse types of damage and destruction simultaneously, to vital infrastructure and even to the life support systems of very large parts of societies and economies.

In seeking to build the resilience of economies, communities and ecosystems, UN Member States adopted the Sendai Framework, which considerably expanded the scope of hazards beyond natural, to include man-made hazards and related environmental, technological and biological hazards and risks. In so doing, States endorsed the shift from managing disasters to managing risks, calling for a better understanding of the underlying drivers of risk[3] as well as their impacts.



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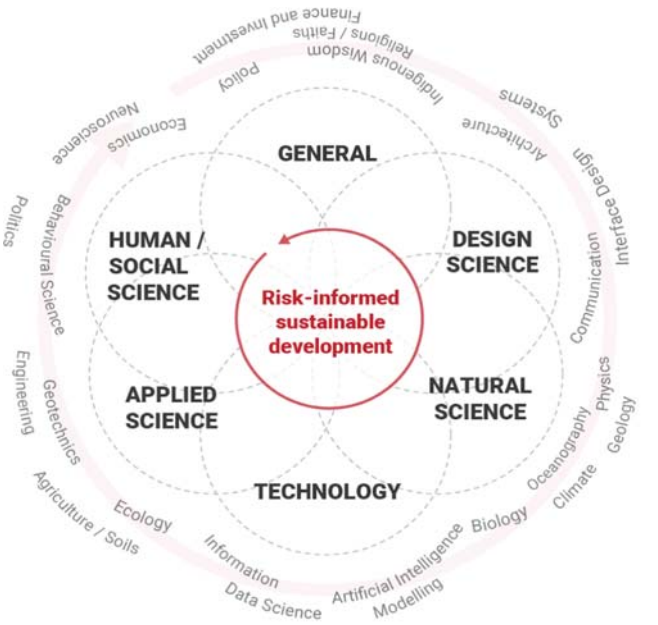
The Sendai Framework stipulates that the global community must come to terms with a new understanding of the dynamic nature of systemic risks, new structures to govern risk in complex, adaptive systems and develop new tools for risk-informed decision-making that allows human societies to live in and with uncertainty.

This compels new conceptual and analytical approaches to improve understanding and management of risk dynamics and risk drivers at a range of spatial and temporal scales. It requires particular emphasis on the interaction among "social, ecological, economic and technological systems" resulting from the activities of humans in nature[4].

The era of hazard-by-hazard risk reduction is therefore over, and while modelling and metrics are important, we can no longer use the past as a reliable indicator of the future. We need to reflect the systemic nature of risk in how we understand and seek to manage it, tuning our understanding of anthropogenic systems in nature. This means moving away from working on distinct even isolated areas of risk (e.g. spatial, geographic, temporal, and disciplinary) when researching, designing and implementing interventions. We need to incentivize interdisciplinary and transdisciplinary, integrated, multisectoral risk assessment, analysis and decision-making to improve efficiency, reduce duplication of effort and allow for connected, collective action. The pluralistic, systemic nature of risk demands a shift in the way we generate, collect, structure data, and organise our research, our thinking, our decisions, how we invest.

With the certainty of near-term non-linear changes, the critical assumption of the relationship between past and future risk must now be revisited. The Sendai Framework defines a new era for the classification, description and management of risk – one that encompasses all sciences as well as indigenous wisdom – for it to be applied in integrated, transdisciplinary approaches seeking the realisation of the outcomes and goals of the 2015 agreements.



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Achieving progress on these issues and generating the insights necessary to guide the determination of mutually reinforcing, collective action assumes inter alia a robust science-policy discourse, a global community of research funders supportive of interdisciplinary and transdisciplinary risk research, and a new cadre of transdisciplinary, systems thinkers, researchers and decision-makers in the public and private domains.

For the risk science community to effectively support, engage and guide the implementation of the Sendai Framework, the Paris Agreement on climate and the 2030 Agenda, in humanity's attempt to establish resilient development pathways for society and planetary health, we must expedite greater alignment and more effective deployment of finite scientific, academic and technological capabilities, and determine and operationalise frameworks for the governance of systemic risks that allow decisions to be made cognisant of (and more comfortable with) complexity and uncertainty. The GAR 2019 and this journal make an important contribution to this discourse and this endeavour, one that will be continued in forthcoming GARs.

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Notes

1. GAR (2019) (gar.unisdr.org)
2. "There is growing agreement between economists and scientists that the tail risks are material and the risk of catastrophic and irreversible disaster is rising, implying potentially infinite costs of unmitigated climate change, including, in the extreme, human extinction". IMF Working Paper No. 19/185, September 2019.
3. Across all risk components – hazards, exposure and vulnerability.
4. The resilience and stability of natural ecosystems, their restoration and regeneration are of paramount importance for systemic risks to be managed effectively. Breaching the limits of those systems presents risks that incur severe (even existential) social, economic and political consequences.