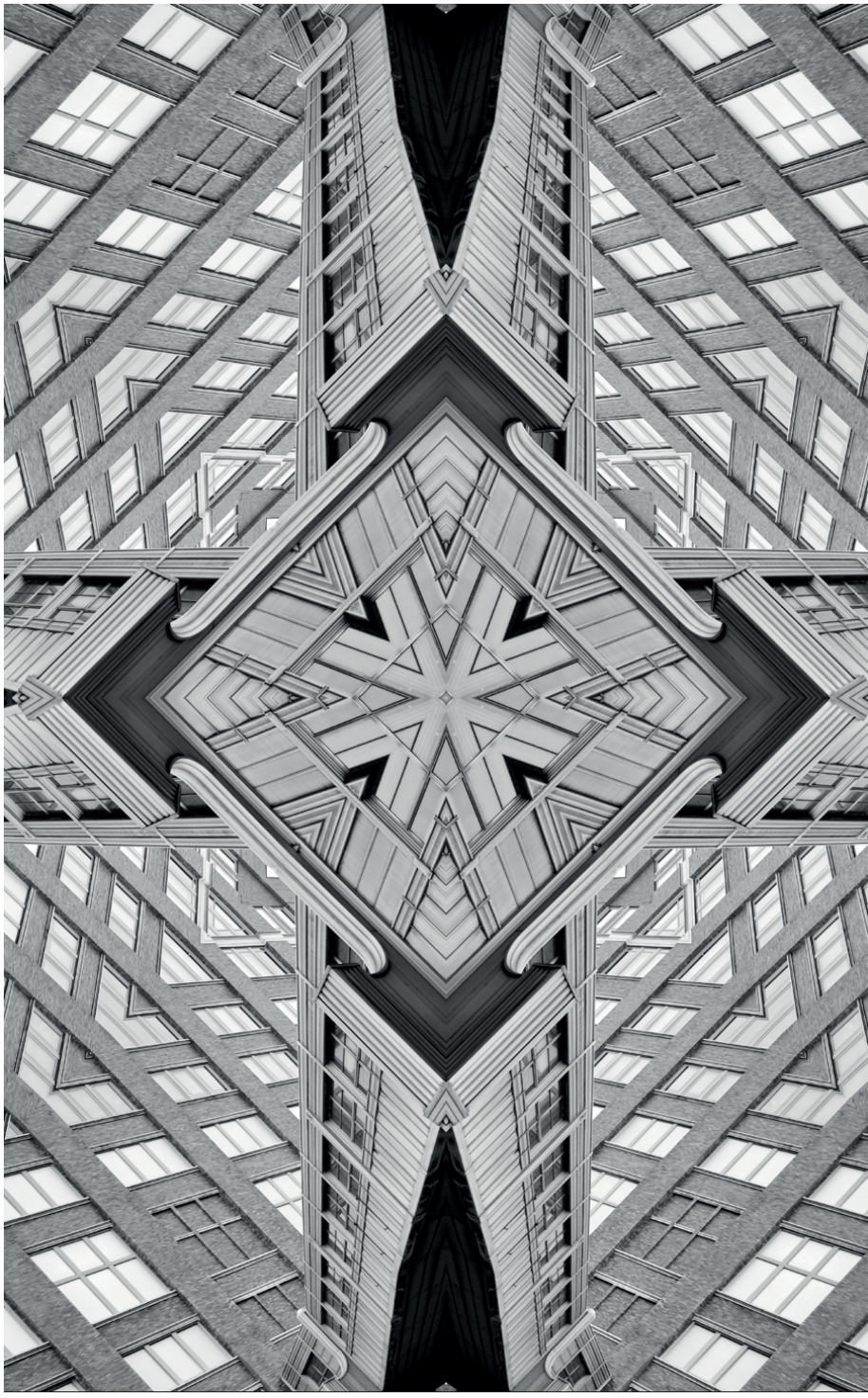
Issue Brief

ISSUE NO. 454
MARCH 2021

ORF OBSERVER RESEARCH FOUNDATION



Creating Pathways for Disaster Risk Financing Post-COVID-19

Madhurima Sarkar-Swaisgood and Ria Sen

Abstract

As South Asia faces an increasingly complex and expanding disaster risk landscape, the COVID-19 pandemic demonstrated the systemic gaps in risk management. There is a need for a paradigm shift in disaster risk reduction—from a single-hazard, single-sector perspective to a multi-hazard, multi-sectoral, and systemic risk perspective supported by parallel risk financing measures. This brief examines the current gaps in the efficient operationalisation of disaster risk financing and outlines three potentially pivotal pathways through which a systemic risk perspective can be incorporated into disaster risk financing. The aim is to build community and economic resilience to future cascading disasters.

Attribution: Madhurima Sarkar-Swaisgood and Ria Sen, "Creating Pathways for Disaster Risk Financing Post-COVID-19," *ORF Issue Brief No. 454*, March 2021, Observer Research Foundation.

Introduction

In the past several years, South Asia[a] has been facing an increasingly complex and expanding disaster risk landscape. According to the 2019 Asia Pacific Disaster Report, as measured by population and economies exposed, countries of South Asia have some of the highest degrees of riskscape in the Asia Pacific region. The COVID-19 pandemic only heightened these risks, as the consequences of the health crisis cascaded with natural calamities and brought massive ruin to the lives and livelihoods of large populations in South Asia. These challenging times call for a paradigm shift in disaster risk reduction—from a single hazard, single sector perspective to a multi-hazard, multi-sectoral, and systemic risk perspective. This paradigm shift needs to be supported by parallel risk financing measures that are more targeted towards building both economic and community resilience. The aim is to strengthen resilience to future manifold disasters that could visit the peoples of the region.

In the context of COVID-19, this brief examines the current gaps in disaster management and financing frameworks and presents three key pathways through which innovations in disaster risk financing can incorporate the multi-hazard, multi-sectoral and systemic risk perspective to build resilience in South Asia.

> "The consequences of Covid-19 cascaded with natural calamities and brought massive ruin to lives and livelihoods in South Asia."

a Countries in South Asia include Bangladesh, Bhutan, India, Pakistan, Nepal, Sri Lanka, and the Maldives.

There is a need for a paradigm shift in financing disaster management, given certain key patterns in both the threats facing South Asia, and the responses that are currently in place.

The impacts of disasters on economies and populations are cascading.

Recent disaster patterns in different parts of the world show that the risks that large populations are facing from hazards are converging and cascading in ways hitherto unseen. It has become urgent to incorporate the complexity of these risks into financing models and measures that seek to address the impacts of disasters. In South Asia, against a backdrop of existing critical socioeconomic vulnerabilities, the deluge of weather events like cyclones and floods, and the related outbreaks of water/vector-borne diseases demonstrates how disaster impacts cascade and converge, and threaten to break the chains that hold economic and social systems together. While South Asian countries have always been highly vulnerable to natural hazards, the more recent disasters are occurring amidst a global pandemic—that of COVID-19, a highly infectious disease caused by the novel coronavirus, SARS-CoV-2. At present, South Asia presents three cascading risks: 1) extreme weather events—floods, cyclones, landslides, and droughts—which heighten already existing socio-economic vulnerabilities; 2) its intersection with rapidly spreading COVID -19; and 3) the nexus with water/vector-borne diseases emanating from the climate extremes amidst the rapidly spreading COVID-19.[1]

It has long been known that biological and natural hazards intersect, increasing the complexity of overall disaster impacts on populations and economies. However, traditional risk assessments have been slow to capture the intersections of hazards and their cascading impacts on the social, economic, and environmental ecosystems. Indeed, following any disaster of meteorological (such as cyclones, floods, and tornadoes) or geophysical nature (earthquakes, volcanic eruptions) that displace large numbers of people, epidemic diseases often emerge. These include diarrhoeal diseases, Hepatitis A and E, measles, meningitis, acute respiratory infections, malaria, and dengue.[2] Therefore, integrated scenario-based risk analytics—comprising standardised hazard, risk and vulnerability assessments as well as mapping hazard interactions—[3] will take on a new importance to understand the extended risk landscape of the region.

A hazard-by-hazard approach has become obsolete.

Heightening hazard complexity means that an approach that considers one hazard at a time has become thoroughly outdated. There is a pressing need to approach risk reduction from a multi-hazard, multi-sectoral perspective. A first step in bridging the gap is investment in multi-hazard early warning systems (MHEWS), which can function in various hazardous events that may occur alone, simultaneously, cascading or cumulatively over time. MHEWS also takes into account potential interrelated effects. As an early warning system for specific hazards and consequences have many shared elements, to begin with, the use of a common MHEWS framework enables the sharing of lessons learnt, creates economies of scale, and eventually reinforces the sustainability of the overall system. An MHEWS provides a common foundation for risk assessment, planning and exercising for hydro-meteorological, geological, and biological, as well as human-induced and technological hazards. It ensures effective emergency response, whether the hazard is frequent and low-impact or rare but high-impact, with time frames ranging from the immediate to multi-year.[4]

To be sure, current MHEWS have yet to incorporate biological hazards,[5] even as the surveillance of infectious diseases is an important component of disaster risk and impact assessments. The rapid spread of COVID-19 has demonstrated that local, national, and international warning systems for pandemics are either underdeveloped or missing altogether. As early as in 2015, the United Nations member states extended the definition of 'risk' to include biological hazards, and adopted the Sendai Framework for Disaster Risk Reduction 2015-2030.[6] The campaign was driven by countries that have experienced disease epidemics from strains of Ebola, MERS, and SARS. One of the framework's seven global targets is to substantially increase the availability of, and access to, multi-hazard early warning systems and disaster risk information and assessments by 2030.

Yet recent documents issued by multilateral organisations do not mention the term 'early warning' often enough. These issuances include the World Health Organization's (WHO) 2019 Novel Coronavirus (2019-nCoV), Strategic Preparedness and Response Plan (2020),[7] the Global Preparedness Monitoring Board Report, *A World at Risk (2019)*,[8] and the International Working Group on Financing Preparedness report, *From Panic and Neglect to Investing in Health Security* (2017).[9] Further, despite the addition of biological hazards to the Sendai Framework, only 81 countries in the world[10] have a national strategy for disaster risk reduction; a few of them reference the threat of disease outbreaks.

In this context, forecast-based financing (FbF), or early action based on in-depth weather forecast information and risk analysis, has been recently advanced as a mechanism to enable the realisation of early action potential associated with early warnings. FbF instruments are devised to enable access to funding for anticipatory actions based on in-depth forecast and risk analysis. The links between FbF programs and MHEWS must be strengthened, if the world is to scale up funding for proactive measures that will mitigate the devastating consequences of cascading and complex hazards.

Financing instruments are not effectively operationalised.

Financing instruments are being developed for potential long-term resilience building, but they are yet to be effectively operationalised for community risk management. This means there is a gap in science policy that needs to be addressed. Whilst the science is undisputed that the world is warming at unprecedented, detrimental levels, financing for climate-resilient development is often limited and fragmented. According to the Organization for Economic Cooperation and Development (OECD), developed countries were projected to increase their levels of public climate financing to USD 67 billion by 2020, compared to approximately USD 38 billion in 2013.[11] A quarter of these finances are used for adaptation—a figure far less than what is needed to address the challenges posed by planetary limits. Limited and fragmented adaptation finance poses a significant challenge for realising risk-informed development pathways. Sustained, targeted adaptation investments are critical—especially at the level of community—to improve preparedness for climate risks and meet overall global development goals.

An amalgamation of different financing instruments is required for addressing climate- and disaster-related impacts. Risk information, for example through disaster risk assessments, plays a critical role in enhancing disaster preparedness and, ultimately, in managing the resultant risks. Risk transfer, through financial means as disaster risk financing and insurance schemes, has been used to limit and reduce fiscal impacts of disasters, without eroding hard-won development gains. The promotion and deep integration of such financial instruments in development planning can absorb debilitating shocks which otherwise can interrupt a country's development trajectory. In this respect, backing resilience-oriented finance with adequate and targeted policy actions requires exploration.

To achieve risk-responsive and risk-informed development pathways, strong government ownership is imperative, complemented by cross-sectoral coordination involving line ministries. In preparing for future risks, targeting key institutions and providing appropriate policy and incentives is necessary

for meeting long-term resilience goals. OECD notes several key incentives to support building resilience: coherent messages on resilience fostered by champions, involving the civil society as a key ally for donors, and providing resourcing incentives to local government bodies that adopt measures for risk management.[12] However, whilst on a macro-scape, national preparedness may be easier to act upon, community-specific resilience—often involving the most vulnerable and marginalised populations—is left behind. The engagement of actors across all levels of governance—from national to subnational/community levels—is most important. Typically, multi-stakeholder engagements, driven by a consultative process, support "buy in" and maintain inclusivity. The challenge remains in steering the process effectively and enabling deliberations in a timely manner.

Sharing experiences across countries and regions can help in conveying best practices and lessons learnt. There is a clear case for better partnerships between developing countries, international development institutions, donor governments, and the private sector. After all, in developing countries, the "enabling environment" for supporting private finance is often limited, as they may lack the management, fiduciary, and technical capacities to engage the private sector effectively.

> "An amalgamation of different financing instruments is required for addressing climate- and disaster-related impacts."

This brief outlines three potentially focal pathways through which innovations in disaster risk financing can incorporate the multi-hazard, multi-sectoral and systemic risk perspective.

Integrating multi-hazard early warning systems in risk analytics

Developing integrated risk analytics that underpin MHEWS and its related forecast-based financing instruments is critical to building long-term resilience of economies and livelihoods. Technological innovations in remote sensing, modeling and GIS-based applications have propelled understanding, management, and pricing of hazard and risks. These innovations have to be used in order to understand the exposure and vulnerability of communities to multiple hazards, including those of biological origin.

Estimating risks, vulnerabilities, and capacities from multiple hazards simultaneously—and developing different risk scenarios based on the analysis—is crucial in preempting natural and health-induced disasters and putting mitigation strategies in place. Without appropriate and comprehensive risk profiles and analytics, actions for resilience may be less effective. This requires both the adaptation of existing preparedness systems as well as additional investments and resources in preparedness, risk estimation and risk reduction (pre-event phases), including developing composite risk matrices, which identify and stratify vulnerable populations and locations to understand the differential needs and capacities.[13]

A wide range of risk analytics such as impact forecasting and risk-informed early warning, indexing and creating risk matrices to target at-risk communities have been developed and put to use in response to the COVID-19 pandemic and its intersection with extreme climate events. Recognising that innovations are key to protect vulnerable communities, there is a need to enhance knowledge and understanding on outstanding challenges and emerging opportunities towards operationalising the risk analytics for intelligent crisis management solutions in specific contexts of cascading disasters.[14] Here, integrated scenario-based risk analytics, which places districts and areas in countries into appropriate risk zones using a composite risk matrix that incorporates endemic, natural, and biological hazard risks—can support countries in identifying and improving their understanding of complex systems and risks, reducing duplication of efforts, and allowing for integrated policy actions.[15] The new analytics can form the backbone of post-COVID-19 standard operating procedures (SOPs) and can be used for more efficient financing mechanisms.

Box 1: Using emerging technologies for complex analytics to support insurance[16]

The use of these analytics has been seen in Nagaland, a landlocked state in north-eastern India where the government, in conjunction with the International Water Management Institute (IWMI) has supported developing weather-based parametric insurance plans for multiple hazards such as drought, hailstorms, humidity, and floods. Using advanced computation modeling, remote sensing, geospatial, gridded datasets for multiple hazards, and crowdsourcing technologies, the insurance parameters have been greatly improved. To scale up the insurance plans, the government partnered with insurance providers such as Tata AIG and Swiss Re to provide a parametric insurance disaster risk financing mechanism that covers the entire state during the monsoon season.

In India, states like Bihar are now also adopting these insurance plans and using similar models to design index-based financing products that support communities to manage their drought and flood risks throughout the disaster cycle. The multi-hazard insurance can also be combined with pandemic insurance. For example, a key challenge in the agriculture sector has been the impact of COVID-19 on farmers—the lockdowns have led to farmers missing harvesting and sowing seasons. This has the potential to drive large-scale fluctuations in food security and nutrition. Amidst the current and future cascading risks, expanding innovative insurance programmes will have positive knock-on effects on the Sustainable Development Goals and will also contribute to poverty reduction in the South Asia and the larger Asia Pacific region.

Adopting and investing in resilience-linked financing instruments

Emerging resilience-linked financing instruments can reduce the gap between sovereign and sub-national risk management interventions and enhance community resilience. The linkage between disaster risk financing and scalable social protection is, therefore, critical. Sovereign disaster risk financing instruments can use insurance tools and manage the contingent liability of social protection, strengthening the resilience of the poorest and most vulnerable.

Often seen as spaces with little connection, bridging the social protection-disaster risk financing gap is critical for reaching the most vulnerable people, in an inclusive and timely manner. In this respect, sovereign disaster risk financing instruments utilise insurance schemes for managing the contingent liability of social protection—ultimately building resilience of the marginalised and poorest populations. Scalable social protection mechanisms can increase payments after disaster events, through certain channels. These channels may be *scaled out*, to provide payments to vulnerable beneficiaries (that were not in the original

social protection programme), to ensure they do not slip into poverty due to climate and disaster-induced shocks. Furthermore, existing special protection programmes can be *scaled up*, to increase the level and frequency of benefits for existent beneficiaries. This functionality allows governments to better manage costs, under a wider sovereign disaster risk financing and insurance strategy. In India, the United Nations World Food Programme (WFP) is providing technical support to the national government's Targeted Public Distribution System (TPDS) which reaches 800 million people monthly.[17] This includes consideration of cash as an alternative transfer modality for the TPDS. This support led the Government to develop operational guidance for the shift of the transfer modality from in-kind to cash in two cities.

Sovereign disaster risk financing helps accelerate financial response capacity of governments, together with enhanced access to effective funding for disaster response and post-disaster reconstruction. Sovereign risk financing includes mobilisation, allocation, and disbursement of funds following disasters, pulling in private capital to meet critical financing needs by transferring risk to international financial markets. Popular examples are Catastrophe (CAT) bonds, catastrophe swaps, or reinsurance. Contingent credit lines, mobilised for instance through the international finance community's "CAT-DDO" (Catastrophe Deferred Drawdown Option), enable governments to secure funds prior to a disaster. Importantly, contingent credit can be used to finance emergency response, in a post-disaster context. This has been valuable in engaging the ministries of finance, and the private sector, in disaster risk management. The Philippines, for example, has integrated an end-to-end system of climate response in its budget cycle, which includes training and technical support to line government agencies.[18] For its part, Indonesia implemented its climate budget tagging framework in 2016 and leveraged it in 2018 to issue green sovereign bonds worth USD 1.25 billion to finance their climate projects.[19]

Examining global good practice on resilience-linked disaster risk finance, the following summary of observations can be put forth:

a. Increasingly, national governments are utilising parametric insurance schemes for financing post-disaster relief and reconstruction. The Caribbean Catastrophic Risk Insurance Facility (CCRIF) is an example. The first ever multi-country risk pool in the world, CCRIF was also the first insurance instrument to successfully develop parametric policies, backed by both traditional and capital markets.

b. Reserve funds for disasters, such as FONDEN Mexico, are utilised for disaster relief and reconstruction. Part of the funds can be used to purchase risk transfer instruments, including insurance premiums and CAT bonds.

FONDEN adopts a graded approach to financial resilience, innovatively amalgamating both risk retention and risk transfer. This enables financial agility and targeting, in order to respond to low-frequency high-impact disasters.

c. A number of technological advances will continue to make Forecast-based Finance more streamlined and achievable. FbF and related insurance measures can now utilise the technological advances in Artificial Intelligence (AI) for streamlining claims processing, as well as detecting underwriting and fraud. Machine Learning models can be used to both predict damage and loss based on risk analysis; it can also more efficiently assess the severity of damages payouts from historical data, sensors and images.

Additionally, blockchain technology is rapidly reshaping transaction tools. The key feature of blockchain—decentralised ledgers that record transactions across a peer-to-peer network— can create transparency and accountability for payouts. A promising dimension of blockchain would be forecast-based financing coupled with smart contracts, underwritten by the technology, between funding organisations and implementing partners. Using integrated weather, climate and health models coupled with machine learning and Big Data, the potential to forecast the onset of multiple disasters and use objective indicators to trigger smart contract transactions for risk reduction, social protection and others, becomes substantial. This can increase the efficiency of funding instruments and reduce the degree to which a country is reliant on ad-hoc funding and donor assistance.

Capitalising on regional cooperation mechanisms

Disaster risk financing must capitalise on regional cooperation to scale up risk transfer and risk pooling mechanisms as suggested in the Sendai Framework. In South Asia, risks are not only systemic but also shared among the neighbouring countries. With climate change, the probability of increases in climate-related natural and biological hazards, including floods, drought, cyclones, and water and vector-borne diseases, has become more inevitable.[20] These simultaneously will have cascading effects on access to resources for the most vulnerable populations and will need concerted financing efforts. Catastrophe risk pooling, as noted earlier, can support disaster-hit countries but these pools need strong political commitments and coordination among countries.

Moreover, because the broad concepts and technical details of disaster risk financing and sovereign risk transfer tend to be less applied or adopted by Ministries of Finance across the world, new integrated risk analytics and emerging

technological advances are key to expanding the scope for disaster and climate risk financing that can build multi-hazard and multisectoral resilience. Some of these approaches have been discussed in earlier sections of this brief.

Recognising, and actively managing, contingent liabilities accruing from multiple disaster risk scenarios has received less attention. Thus, there is a need for capacity building and knowledge transfer in a structured and coordinated way to foster peer learning and south-south cooperation to ensure proliferation of best practices. Regional cooperation for knowledge sharing in four areas_in particular could bolster the larger milieu of disaster risk financing:

- understanding risks from all hazards based on integrated scenario modeling including early warning systems;
- national risk financing strategy development and implementation;
- coordination with broader disaster risk management programmes and strategies; and
- scaling up the technical aspects of weather-based insurance, and insurance business practices.[21]

> "Disaster risk financing must capitalise on regional cooperation to scale up risk transfer and risk pooling mechanisms."

Conclusion

Madhurima Sarkar-Swaisgood *is Economic Affairs Officer at UNESCAP.*
Ria Sen *is Disaster Risk Reduction specialist at the UN.*

Comprehensive financial protection strategies not only need to address and account for all sources of risks but have to begin accounting for complex, converging and cascading disasters. The COVID-19 pandemic has shown that hazards intersect and create compounding shocks on populations—some of which take generations to recover. Financial instruments, therefore, need to appropriately incorporate more complex financial structures and triggers.

This will require: (1) developing integrated risk analytics that underpin MHEWS and its related forecast-based financing instruments using technological innovations in remote sensing, modeling and GIS-based applications to propel understanding, management, and pricing of hazard and risks; (2) scaling emerging resilience-linked financing instruments that can manage the contingent liability of social protection, strengthening the resilience of the poorest and most vulnerable; and (3) capitalising on regional cooperation to scale up risk transfer and risk pooling mechanisms as suggested in the Sendai Framework. Risk financing mechanisms are a powerful tool for building economic and community resilience to shocks. With climate change threatening the future of the planet, operationalising and contextualising these mechanisms will be key to protecting the world's most vulnerable populations and their livelihoods.ORF

(Disclaimer: Views expressed in this brief are those of the authors, and do not represent those of the organisations they are affiliated with.)

Endnotes

1 UNESCAP. (2020). Pathways to manage cascading risks and protect people in South Asia: Key takeaways for stakeholders. Available at https://www.unescap.org/sites/default/d8files/knowledge-products/FINAL__2%20Pathways%20of%20cascading%20risks-%20fomatted%20in%20ESCAP%20template%2009252020.pdf

2 Watson, J. T., Gayer, M., & Connolly, M. A. (2007). Epidemics after Natural Disasters. Emerging Infectious Diseases, 13(1), 1. https://dx.doi.org/10.3201/eid1301.060779.

3 UNESCAP. (2020). Scenario-based risk analytics for managing cascading disasters. Available at https://www.unescap.org/resources/scenario-based-risk-analytics-managing-cascading-disasters

4 Global Platform for Disaster Risk Reduction. (2019). Multi-hazard early warning systems: progress and challenges to achieve target G: GP working session specific issue brief. Available at https://www.unisdr.org/conference/2019/globalplatform/programme/working-sessions/assets/pdf/5ccaf13965618WS15-Issues_Briefs.pdf

5 Foran, J. A., & Brosnan, T. M. (2000). Early warning systems for hazardous biological agents in potable water. Environmental health perspectives, 108(10), 993–995. https://doi.org/10.1289/ehp.00108993

6 Sendai Framework for Disaster Risk R\eduction 2015-2030. https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030

7 World Health Organization. (2020). 2019 Novel Coronavirus. Strategic preparedness and response plans. Available at https://www.who.int/docs/default-source/coronaviruse/srp-04022020.pdf

8 Global Preparedness Monitoring Board. (2019). A world at risk: annual report on global preparedness for health emergencies. Available at https://apps.who.int/gpmb/assets/annual_report/GPMB_annualreport_2019.pdf

9 The World Bank. (2017). From panic and neglect to investing in health security: financing pandemic preparedness at a national level. Available at https://documents.worldbank.org/en/publication/documents-reports/documentdetail/979591495652724770/from-panic-and-neglect-to-investing-in-health-security-financing-pandemic-preparedness-at-a-national-level

10 Fearnley, CJ., Dixon D. (2020). Early warning systems for pandemics: lesseons learned from natural hazards. International Journal of Disaster Risk Reduction, 49: 101674. Available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7228879/pdf/main.pdf

11 OECD, *2020 Projections of Climate Finance Towards the USD 100 Billion Goal Technical Note. https://www.oecd.org/environment/cc/Projecting%20Climate%20Change%202020%20WEB.pdf*

12 OECD (2013). Risk and resilience: from good idea to good practice. Available at http://www.oecd.org/dac/conflict-fragility-resilience/docs/Resilience_and_Risk_Good_ideas_Good_practice.pdf

Endnotes

13 ESCAP. (2021). Weaving a stronger fabric: managing cascading risks for the climate resilience. Available at https://www.unescap.org/sites/default/d8files/knowledge-products/Summary%20for%20Policymakers-%20Weaving%20a%20stronger%20fabric.pdf

14 ESCAP (2020). Investing in innovative solutions to manage cascading disaster risks in South Asia: key takeaways for stakeholder. Available at https://www.unescap.org/resources/investing-innovative-solutions-manage-cascading-disaster-risks-south-asia-key-takeaways

15 UNESCAP. (2020). Scenario-based risk analytics for managing cascading disasters. Available at https://www.unescap.org/resources/scenario-based-risk-analytics-managing-cascading-disasters

16 https://www.unescap.org/resources/investing-innovative-solutions-manage-cascading-disaster-risks-south-asia-key-takeaways

17 World Food Programme, *India, Target Public Distribution Reforms in Bhubaneswar: Evaluation,* https://www.wfp.org/publications/india-target-public-distribution-reforms-bhubaneswar-evaluation

18 Economic Times, *View: Time to include climate-responsive budgeting*, https://economictimes.indiatimes.com/news/economy/policy/view-time-to-include-climate-responsive-budgeting/articleshow/80281434.cms?from=mdr

19 Ibid.

20 Swaisgood, M.S., and Srivastava, S. (2020). When Covid-19 and natural hazards collide: building resilient infrastructure in South Asia. Available at https://www.orfonline.org/wp-content/uploads/2020/10/ORF_IssueBrief_413_Disasters-Covid.pdf

21 ESCAP (2018). Disaster risk financing: opportunities for regional cooperation in Asia and the Pacific. Available at https://www.unescap.org/sites/default/d8files/knowledge-products/Disaster%20Risk%20Financing%20Oportunities%20for%20Regional%20Cooperation%20in%20Asia%20and%20the%20Pacific.pdf

Images used in this paper are from Getty Images/Busà Photography.

ORF OBSERVER RESEARCH FOUNDATION

Ideas . Forums . Leadership . Impact

20, Rouse Avenue Institutional Area,
New Delhi - 110 002, INDIA
Ph. : +91-11-35332000. **Fax :** +91-11-35332005
E-mail: contactus@orfonline.org
Website: www.orfonline.org