



Weaving a Stronger Fabric: Managing Cascading Risks for the Climate Resilience



Background

The convergence of COVID-19 with natural hazards such as cyclones and floods has created a hitherto unseen complex, compounding, and cascading risk landscape in South Asia. The capacity for managing disasters and public health emergencies to respond to these converging risks is key to recovering from the COVID-19 pandemic and preparing better for future crises.

Against that backdrop, the UN Economic and Social Commission for Asia and the Pacific (UNESCAP) convened a virtual **High-Level Policy Dialogue - COVID-19 and South Asia: Socio-Economic Impacts, National Strategies and Subregional Cooperation for Building Back Better** on 9 July 2020. The UNESCAP Executive Secretary, the Secretary-Generals of SAARC and BIMSTEC and the economy/planning ministers of South Asian countries addressed the Dialogue. A key recommendation from the dialogue was the need to scale up regional cooperation in building back better by building subregional platforms in coordination with SAARC and BIMSTEC secretariats and other development partners.

In the specific context of addressing cascading risks and bringing together multiple stakeholders under one discussion platform, UNESCAP with National Institute of Disaster Management (NIDM), India, SAARC TB and HIV/AIDS Centre (STAC), and BIMSTEC Centre for Weather and Climate Centre (BCWC), have been engaged in an expert webinar series. The final high-level webinar in the series was

organized by UNESCAP against the backdrop of the South Asia SDG Forum, under the aegis of the Asia-Pacific Disaster Resilience Network. The Special High-Level Event on Disaster and Climate Resilience in South Asia was held virtually on 4 December 2020. Ministers dealing with environment/ disaster management in five South Asian countries namely Afghanistan, Bangladesh, India, the Maldives, and Pakistan, director/heads of the SAARC Secretariat, the Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES), the BIMSTEC Centre on Weather and Climate (BCWC), the National Institute of Disaster Management (NIDM), India, and the Asian and Pacific Centre for the Development of Disaster Information Management (APDIM) addressed the meeting.

The meeting discussed (a) opportunities and imperatives to overcome the challenges in implementing a systemic approach to disaster and public health risk management amidst the COVID-19 pandemic, and (b) strategies to capitalize on existing regional and sub-regional cooperation mechanisms including the South Asia Forum on SDGs, to scale up multi-hazard and multi-sectoral preparedness systems for future cascading disaster risks.

This report synthesizes the discussions, outcomes and key recommendations that have emerged from the high-level event.

Weaving a Stronger Fabric:

Managing Cascading Risks for the Climate Resilience

Across South Asia, COVID-19 has ripped apart the region's social and economic fabric. The pandemic has exposed the fragility of healthcare services, the inefficiency of social protection frameworks, and the lack of economic resilience. The catastrophe struck a region already strained by climatic disasters, from floods to cyclones to droughts, and demonstrated how all its social and economic ties are tightly interwoven – pull away at one thread and daily life starts to fall apart. Restoration will start with vaccination, but it cannot end there. Countries across the region will need to anticipate the simultaneous impacts of cascading risks and weave more flexible and resilient social and economic systems.

Starting as a health emergency, the COVID-19 pandemic evolved into an economic and human crisis of mammoth proportions. Governments had to respond quickly. In efforts to contain the pandemic and save lives, and reduce the pressure on overburdened healthcare systems, governments locked down their populations. This slowed the spread of the virus but it also suddenly disrupted economic activity and employment and pushed millions of people into poverty and hunger.

Over the same period, South Asia, has been submitted to extreme weather events – a sequence of floods, cyclone, landslides, and droughts along with related outbreaks of water- and vector-borne diseases. These hazards are all too familiar, but for the first time in living memory, they struck amidst a global pandemic – cascading and converging and threatening the very fabric of societies. It had been hoped that 2020 would be a year when countries across the region could accelerate towards the Sustainable Development Goals. But under the onslaught of the pandemic the SDG aspirations have taken a back seat, and instead on some indicators countries started to regress.¹

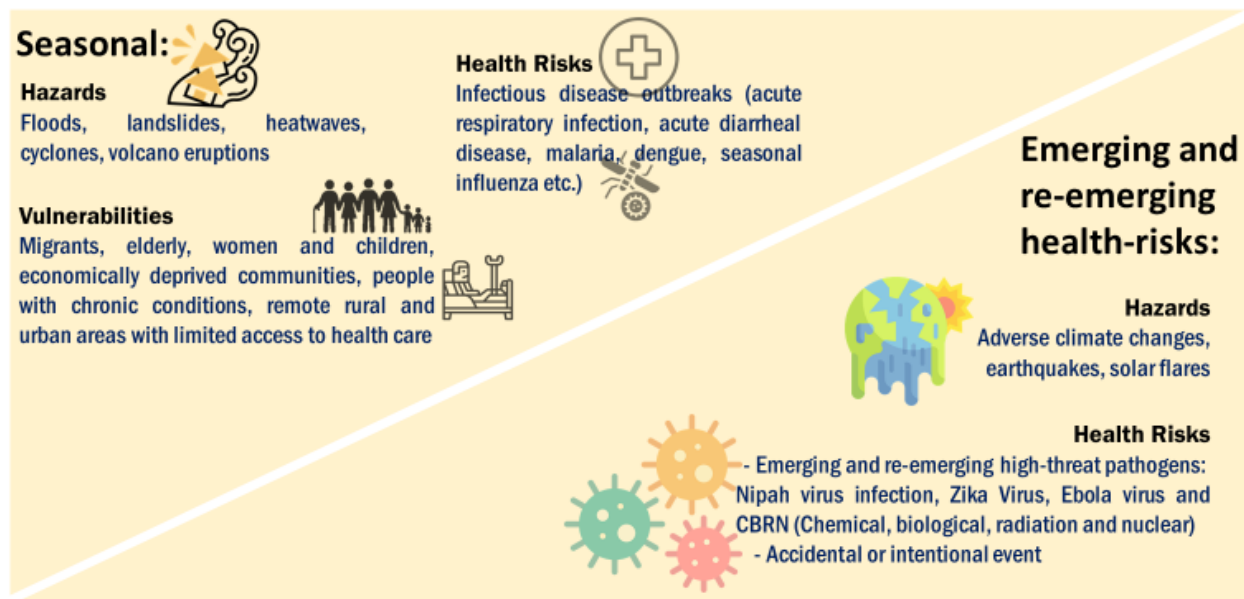
Countries will need to get back on track with the SDGs while protecting their most vulnerable people from these cascading risks. This will demand a new approach – looking beyond short- and medium-term risk management to create integrated strategies for reducing disaster risk and building greater resilience. This summary for policymakers reflects current thinking of experts and policymakers in a number of sectors and presents key findings that can guide future management of cascading hazards.² This is summarised in the following key findings.

1. Health and other Disasters Intersect and interconnect

South Asia is regularly struck by meteorological events such as cyclones, floods, droughts, heatwaves, and some areas have the potential for earthquakes and glacial lake outburst floods. It has long been known that these events will intersect with biological hazards.³ Any disaster that displaces large numbers of people will heighten the risk of epidemic diseases such as diarrhoeal diseases,

hepatitis A and E, measles, meningitis, acute respiratory infections, malaria or dengue. In South Asia in particular, the convergence of these hazards with COVID-19 has opened up a whole new risk landscape with complex and compounding effects that have spilled over to numerous social and economic sectors.

Figure 1: Intersecting hazards and risks (Source: WHO 2018)



The disaster-health nexus

Over recent decades, Asia and the Pacific has been subjected to a high proportion of the world’s natural and biological disasters. This partly corresponds to its size. The Asia-Pacific region has 60 per cent of the world’s people and 40 per cent of its landmass,

as well as 36 per cent of global GDP.⁴ Most of this population is in the South and South-West Asia subregion – which is particularly exposed to biological, climatological, and hydrological hazards (Figure 2).

Figure 2 – Asia and the Pacific subregions exposed to biological and natural hazards

Occurrence of Hazards in Asia Pacific Subregions (2000–2020)



Total Number of People Affected from Hazards in Asia Pacific Subregions (2000–2020)



Note: The Asia-Pacific subregions are East and North-East Asia (ENEA), North and Central Asia (NCA), Pacific, South-East Asia (SEA), and South and South-West Asia (SSWA).

In addition to natural hazards, the subregion is constantly exposed to outbreaks of disease. These include: vaccine-preventable diseases such as diphtheria, tetanus, and pertussis; water- and vector-borne diseases such as malaria and cholera; and respiratory and zoonotic infections (pathogens jumping from animals to human beings) such as SARS and COVID-19. Many of these are endemic, notably dengue, typhoid, tuberculosis, and chikungunya. WHO identifies the largest biological threats to the region as Middle East respiratory syndrome, diarrheal diseases, Crimean–Congo haemorrhagic fever, Japanese encephalitis and zika virus disease.⁵

Outbreaks of disease have often accompanied natural disasters. Droughts, for example, perpetuate cycles of malnutrition and additional disease. Floods and cyclones have historically ushered in water- and vector-borne diseases. Earthquakes damage critical healthcare infrastructure, cause injuries and post-traumatic stress disorders, and add to the overall disease burden.⁶ Nevertheless, these hazards and impacts have often been addressed individually in silos – resulting in major gaps in preparedness.

For those concerned with emergency and disaster management, the COVID-19 pandemic will not have

come as a surprise. For several years, experts studying animal and human virus interactions have been warning of the potential for zoonotic spillovers and the risk of a global pandemic. The risks have been heightened by climate change and the greater number of people in close proximity to animal habitats due to deforestation, urbanization, and unsustainable agriculture – and the dangers are likely to intensify. The IPCC's sixth assessment report notes that climatic variations create new ecological niches for both vector-borne and zoonotic diseases, changing where and when they occur.⁷ In addition, higher temperatures – 30-32° C – can also increase vector densities.⁸ Sandflies, for example, the carriers of leishmaniasis, are more active at higher temperatures and take more frequent bloodmeals thus increasing the rates of transmission.⁹ Climate change is also increasing the risks of drought which drives a cycle of malnutrition among rural populations. All these events have severe impacts on human health, compromising growth, weakening the immune system, adding to mental health woes and psychosocial imbalances, and deepening existing inequalities. They also threaten to overwhelm national and local health systems.¹⁰

COVID-19 and natural hazards

For South Asia, with a population of 1.8 billion, the pandemic has been an unprecedented socioeconomic crisis. This is a subregion with poor public health infrastructure where a high proportion of workers are in the informal sector with little or no social protection. Millions of people have lost their jobs, notably in labour-intensive exports such as readymade garments and in tourism, many working in small, medium and micro enterprises. Economic growth has ground to a halt, threatening to increase poverty, hunger and inequality.¹¹

A large number of India's poor live in crowded informal settlements. Each year during the monsoon season they have to contend with the usual

problems of floods, waterlogging, and vector-borne disease. This year they also had to deal with COVID-19 in circumstances where it is impossible to impose social distancing. The crises came to a head in the monsoon season. In 2020 in North-eastern India and Nepal nearly four million people were affected by heavy flooding, with the death toll rising to almost 200. Assam had the highest single-day spike of 1,218 COVID-19 cases during the heaviest floods. Heavy monsoon flooding affected 28 districts and uprooted over 51,000 people. The lockdowns made it difficult to for relief to get through. COVID-19 care centres had to double as shelters

where it was difficult to ensure social distancing and the wearing of masks.¹²

COVID-19 also intersected with cyclones. In May 2020, during cyclone Amphan, coastal communities faced a daunting choice of either braving the cyclone or risking COVID-19 infection in shelters. Social distancing increased the safe area required per person from 3.5 to 5 square metres – a major challenge for more than six million evacuees.

The combination of natural disasters with the pandemic also stretched health infrastructure. In Kolkata, hospitals already at capacity from COVID-19 faced a second wave of disruption during cyclone Amphan. With internet connections and cell phone services down, hospitals struggled to contact patients' families, and test reporting was delayed. In June 2020 in Mumbai, cyclone Nisarga also damaged roads and power lines, cutting off medical supplies to remote villages and districts. Hospitalizations in Maharashtra are also likely to increase as a result of impending heatwaves.

The pandemic has exposed systemic gaps in disaster management and has forced countries to recognize that natural, biological, and other hazards cannot be addressed separately.¹³ Responding to the current crisis and to similar events in future will require a comprehensive preparedness system – one that integrates health and disaster management into a stronger social and economic fabric. There is an opportunity now to build the knowledge base and augment interdisciplinary interaction between health, disaster management and all the affected sectors.

Governments will also be working on stimulus programmes. These should be opportunities to invest in disaster-resilient infrastructure, in climate adaptation and in decarbonizing economies, and more broadly in supporting the SDGs through investments in education and skill development, health, gender, sanitation and social protection.

2. Risks to uncertainties: more complex scenarios

The intersection of the COVID-19 pandemic with climate extremes is creating a new paradigm with deep uncertainties. Responders on the ground have to managing both risk and uncertainty. Future disaster planning will therefore need to engage with more complex and dynamic scenarios. These should take into account not just the vulnerability, exposure and impacts of both natural and biological hazards but also the non-linear transitions of biological hazards from one phase to another. The combination of systemic risks with deep uncertainties can be captured in different scenarios (Box 1). These can identify the regions which are hotspots of emerging diseases, including those with pandemic potential, for managing systemic risks through well-informed policy interventions.

Scenarios should draw on the expertise of a range of stakeholders from multiple disciplines who can provide much needed information as well as indicate the potential contribution of volunteers, local government officials, and relief workers.

Scenarios should be based on advanced systemic risk assessments that identify the most vulnerable populations during concurrent crises.¹⁴ This will be crucial if the planners are to know, for example, how many shelters are required, provide proper safety measures, address privacy issues and ensure rigorous health monitoring. Countries need to lay the foundations for these scenarios now, while responding to the current crisis, for a strong, sustained and socially inclusive response grounded in the SDGs.

Box 1: Understanding systemic risks – scenario-based approaches

Systemic risks are especially unpredictable because they are both complex and heterogeneous. Nevertheless, they have five generic properties that set them apart from other kinds of risks. Such risks tend to be:

1. **Complex** – Systemic risks are highly complex, with many factors influencing both their emergence and their trajectories of development. They are tightly coupled both with each other and with traditional risks, and neither the probability of their occurrence nor the extent of the damage they will cause can be accurately identified by established methods of science. Instead, science sketches their behaviour using mathematical models.
2. **Transboundary** – Systemic risks are transboundary and global. Although they originate in one subsystem of society or the environment, they have ripple effects through all social subsystems, including the economy, politics, and civil society.
3. **Stochastic** – Systemic risks are ‘stochastic’ – random and probabilistic – so that identical causes can lead to diverging results. These risks are highly interconnected, complex and non-linear, and cannot be tracked on the basis of deterministic relationships between cause and effect. This poses major challenges to risk governance and communication.
4. **Subject to tipping point** - A complex system can remain stable for an indefinite length of time but then suddenly reach a tipping point that drastically changes its conditions of existence – and even lead to complete collapse. Systems often depart from one steady-state condition to the next after going through a phase of collapse and re-organisation. These tipping points are difficult to identify in advance.
5. **Underestimated** – Because of uncertainties about their points of occurrence and extent of the damage they can lead to systemic risks are difficult to deal with and are typically underestimated in terms of either public policy or public perception. And even when the public is aware of a risk and perceives it be important there may be little action to get to the root of the problem.

Figure 1. Scenario-based approaches for managing risks amidst deep uncertainties



COVID-19 and natural hazards

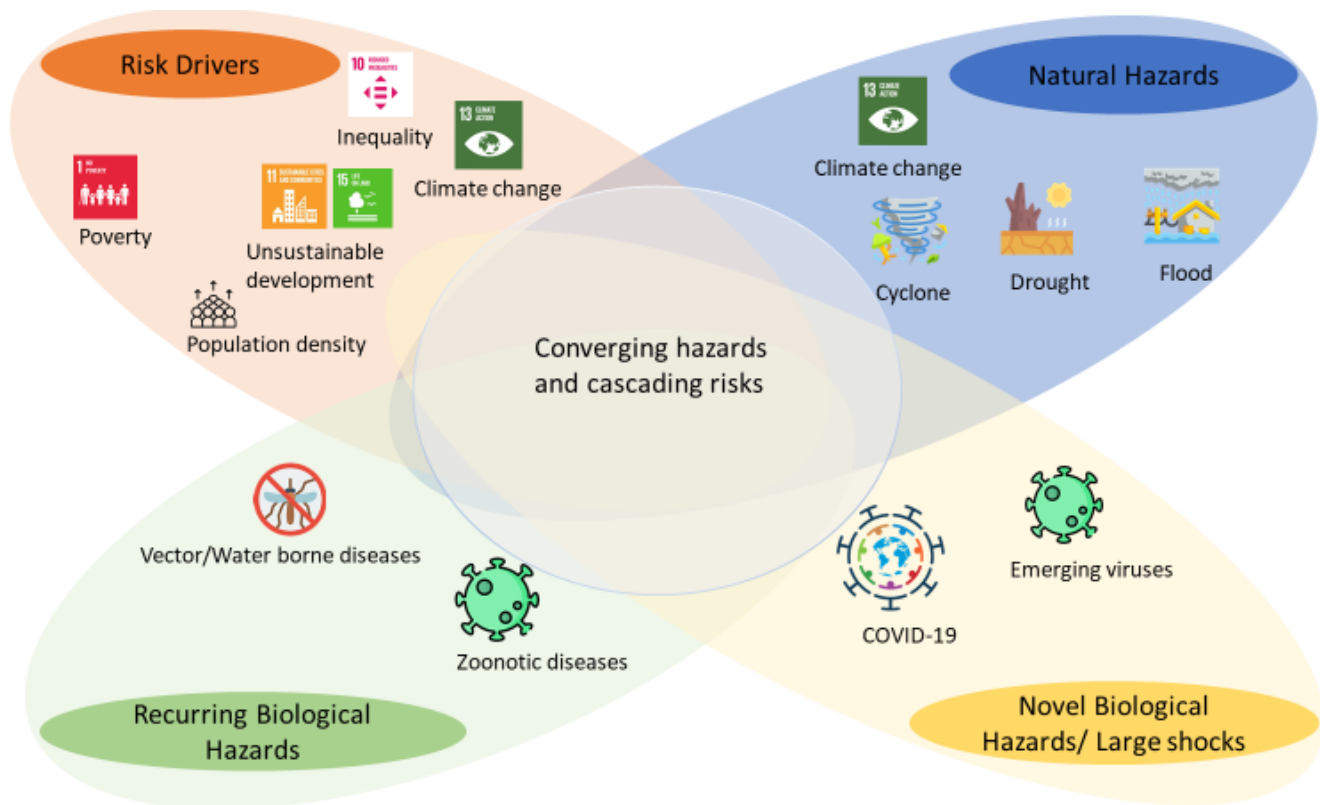
The best way to pre-empt natural and health-induced disasters is to estimate risks, vulnerabilities, and capacities from multiple hazards at the same time. These data can then feed into algorithms to provide the basis for plans for public health emergencies, and strategies for disaster risk reduction and management.

This will mean shifting from a compartmentalized, or hazard-by-hazard approach, to comprehensive risk assessments. Different sectors should come together to improve the common understanding of

complex systems and risks, and collectively identify solutions that improve efficiency, reduce duplication of effort, and allow for integrated policy actions.

Planners can develop composite risk matrices which identify and stratify vulnerable populations and locations and their different needs and capacities. These matrices will form the backbone of new and updated standard operating procedures, local, state, and national policies, and regional cooperation efforts (Figure 3).

Figure 3 Cascading scenario planning – intersection of multiple hazards

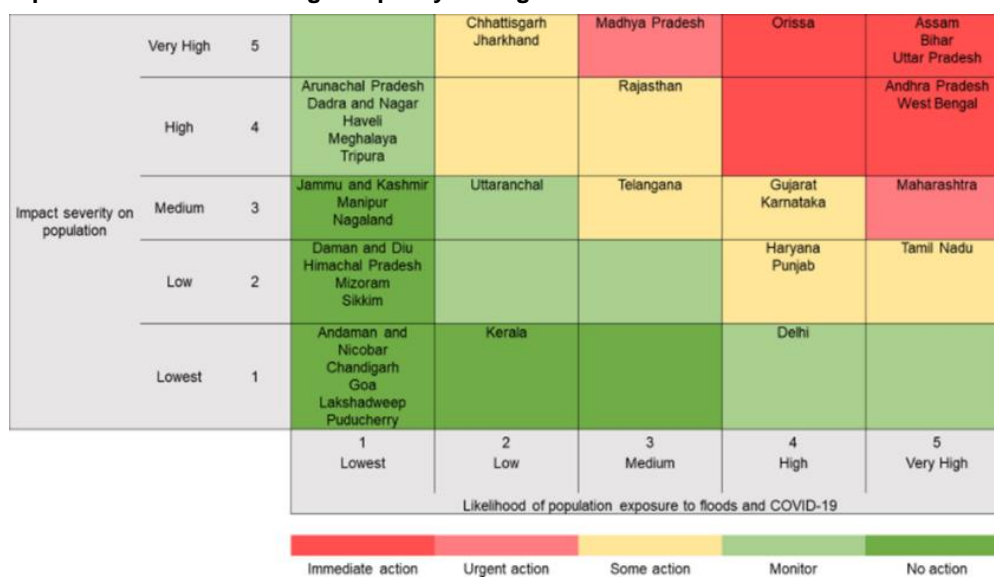


Some of this work has already begun. For example, the World Health Organization has identified the steps needed for all-hazard preparedness, including a comprehensive understanding and ranking of all the subregion’s biological and natural hazards and their related vulnerabilities.¹⁵ If risk analytics is to support targeted policy making, however, it has to be customized and carried out at sub-national levels.¹⁶

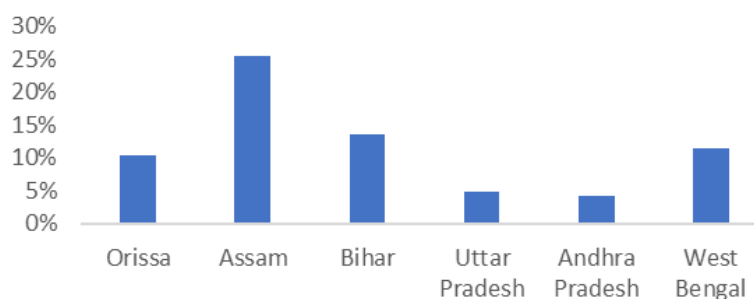
ESCAP has recently demonstrated a prototype that can place districts or areas into appropriate risk zones, using a composite risk matrix incorporating endemic, natural, and biological hazard risks.¹⁷ Figure 4 illustrates this methodology with a risk

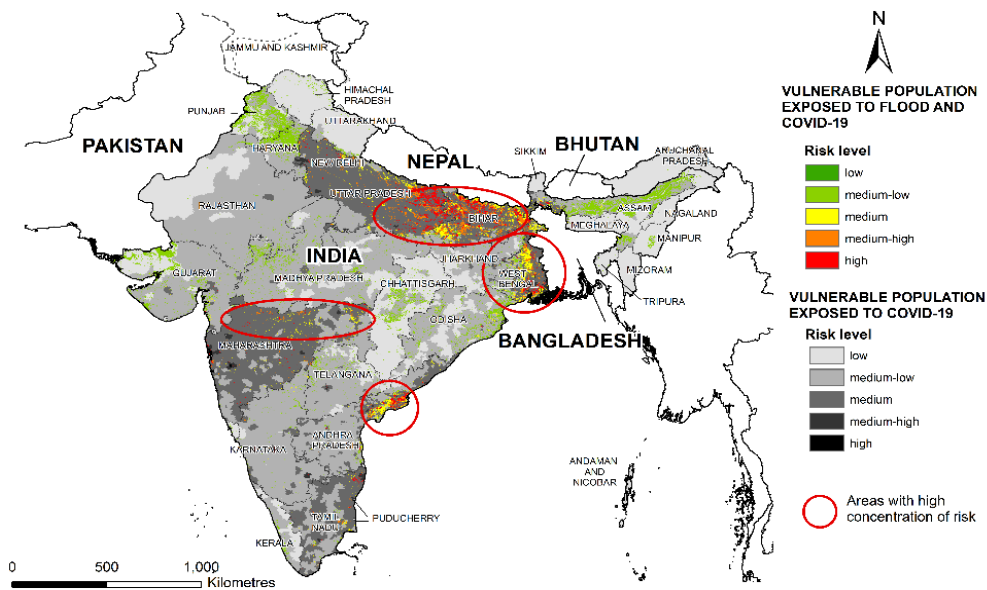
matrix for India which integrates data from diverse sources and shows the states most exposed to cascading disasters. The matrix identifies ‘red-zone’ districts and areas where healthcare infrastructure is already overstretched by COVID-19 cases. These could now be affected by wide-scale flooding which can damage health infrastructure while adding to the disease burden with increasing incidences of flood-related dengue and malaria. The matrix thus indicates the states and populations that can benefit most from integrating disaster and health management systems, and stronger co-operation between planning ministries and line ministries of health and disaster management.

Figure 4 – Composite risk matrix for targeted policymaking



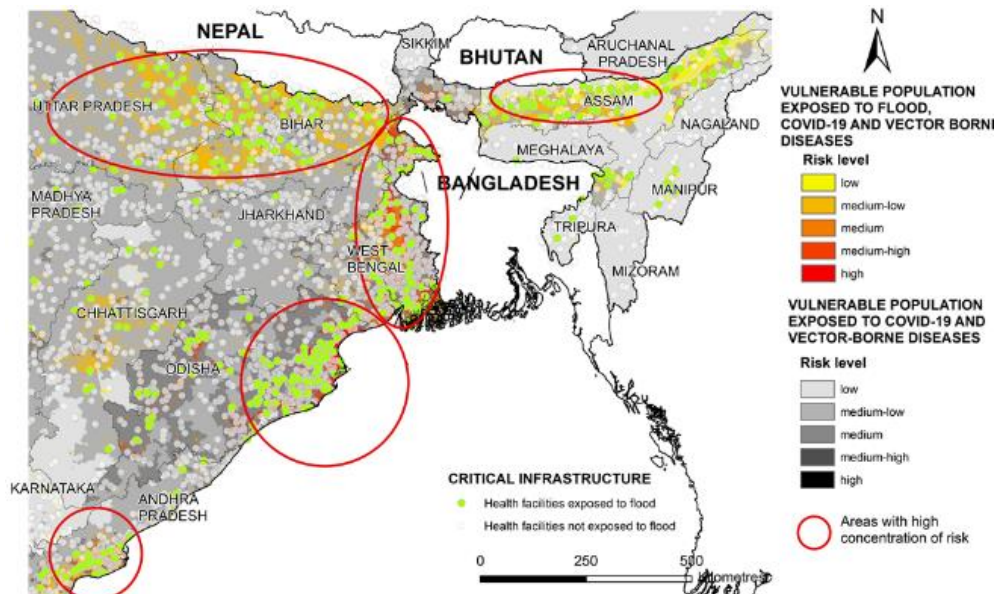
Percent and location of health facilities under current flooding in priority provinces with highest at-risk population





Sources : ESCAP calculations based on UN WPP-Adjusted Population density 2020, v4.11; Sub-National Human Development Index (SHDI) 2018; Centers for CDC and WHO Coronavirus COVID-19 Cases, 9 August 2020; and UNOSAT-UNITAR analysis on NOAA-20 (VIIRS) Imagery, 20 June - 19 July 2020.

Disclaimer: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.



Sources : ESCAP calculations based on UN WPP-Adjusted Population density 2020, v4.11; Sub-National Human Development Index (SHDI) 2018; Centers for CDC and WHO Coronavirus COVID-19 Cases, 9 August 2020; India's State Wise Malaria and Dengue Cases, 2014-2018; India's health care facilities, 2020; and UNOSAT-UNITAR analysis on NOAA-20 (VIIRS) Imagery, 20 June - 19 July 2020.

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These composite risk matrices can support future planning for all possible events. They can help with assessments of legal frameworks and of national, sectoral, and local capacities for community

planning, and early warning systems. This should enable risk-informed policy making that is comprehensive, customized and synergistic.

Incorporating advances in climate science

The experience of managing climate and health disasters against the backdrop of the COVID-19 pandemic in South Asia has re-established the importance of climate services. These have benefited from significant technological advances. In India, for example, advanced technology using supercomputers and satellite imagery is producing state-of-the-art weather and climate models for different timescales – short, medium, extended, and seasonal. The BIMSTEC Centre for Weather and Climate based in New Delhi is already a leader in this area. It has built ‘seamless’ models that can produce climate forecasts that go from the smallest

scale, such as cities, to national or global levels, and for hours, months or years ahead.

The BIMSTEC modelling framework is mainly being used for agriculture and water resource management. It has yet to be applied for public health, and disaster management. Translating climate model output to real-life situations and complex risk scenarios is no simple task, but modelling skills have greatly improved in recent decades and should now be used to integrate risk scenarios into more comprehensive systems.

3. Emerging technologies with huge promise

In South Asia, the pandemic collided with weather-related disasters to deliver unprecedented shocks. However, these events have also highlighted the value of a number of innovative technologies that have demonstrated their worth for immediate disaster monitoring and for future preparedness.

Sophisticated technologies were used in 2020 during the COVID-19 period when cyclones Nisarga and Amphan hit South Asia. Forecasters applied risk analytics, remote sensing and geoinformatics to provide early warnings with substantial lead times and pinpoint accuracy. This information was fed into composite risk matrices for complex evacuation plans – enabling governments and on-the-ground responders to repurpose evacuation shelters according to specific community risks. Another key innovation was the open-source COVID-19 contact tracing app in India, *Aarogya Setu* (bridge to health). This became the world’s most downloaded contact

tracing COVID-19 application and has helped the Government identify infection clusters.

In Bangladesh, Google AI has used machine-learning models to run hundreds of flood simulations that predict flooding with great accuracy and provide stratified risk information that can be used to plan evacuation with the necessary social distancing. Bangladesh also has many social entrepreneurs who are using cutting-edge technology in the fields of health, gender, disasters, and environmental management.

Digital technologies have huge potential, but they need to be introduced carefully, with due consultation to ensure democratic outcomes. In many countries they have already been integrated into government-coordinated mitigation processes for COVID-19 and are accessible to many people.

Integrated insurance and financing to support the most vulnerable

Larger enterprises and better off households can address disaster risks through insurance. Poor communities, particularly in rural areas, have fewer affordable options. More recently, however, innovations in remote sensing, modelling and GIS-based applications have created greater opportunities for managing and pricing disaster risks even in remote areas.

One success has been index-based parametric insurance. This bases payouts not on verified damage but on a triggering 'index' event such as a drought or a flood. Once the threshold is passed those insured can receive immediate payments rather than having to wait for individual assessments. Parametric insurance has been deployed, for example, in Nagaland, a landlocked state in north-eastern India. The state Government has invested in index-based solutions for multiple perils – drought, hailstorms, humidity, and floods. These plans, developed in conjunction with the International Water Management Institute (IWMI), for multiple hazards, use advanced computation modelling, remote sensing, crowd sourcing and geospatial-gridded datasets. To scale up these insurance plans, the state government has partnered with insurance providers such as Tata AIG and Swiss Re to provide a parametric insurance

mechanism that covers the entire state during the monsoon season. This innovative solution could be scaled up to strengthen disaster resilience and, when combined with a gender-sensitive response and risk strategy, can help people become more effective in managing their own risk.

Similar insurance plans are being adopted in flood- and drought-prone states in India such as Bihar, using index-based financing products that help communities manage their risks throughout the disaster cycle.

COVID-19 created an additional class of risk in the form of lockdowns which caused farmers to miss harvesting and sowing seasons – with serious implications for food security and nutrition. The IWMI model could therefore also incorporate pandemic risk. To manage multiple risks effectively, index-based insurance would, however, need to be complemented with access to seeds and climate information, as well as better communication between farmers, government and various stakeholders.

Financing for pandemic and disaster management can also come from the COVID-19 fiscal stimulus packages which can be invested in building resilient livelihoods for the future.

Digital innovations that empower communities

Technological advances have helped save lives and livelihoods, but new technology cannot be fully operationalized without community support. This will require careful communications, presenting the hazard information clearly so that people can combine this with community knowledge to develop localized interventions. In India, for example, digital solutions have been used for health services and could be further integrated into disaster and emergency management systems (Box 2).¹⁸

Bangladesh has successfully applied advanced technology for community empowerment on an enormous scale for its cyclone evacuation programmes. Communities can now use their mobile phones to track cyclones, make decisions on evacuations, and also receive preparedness training. During the most recent cyclones, they knew when the cyclone would reach their villages so they could take steps to reduce the damage and

evacuate on time. Similarly in India, multiple emerging technologies, including weather tracking and proactive COVID-19 testing, together have saved lives and livelihoods (Box 3).

Just as the technologies have advanced so has the understanding of how to use them. Countries and communities have recognized that each disaster provides learning opportunities, using iterative methods for policy development. Good feedback loops can monitor the consequences of different policies – both intended and unintended – while helping build community ownership. This has been critical to the success of the cyclone evacuation programme in Bangladesh. Over time, through an iterative process, the programme has developed multi-purpose evacuations shelters with separate facilities for women, and accessible paths for disabled populations, as well as hilltop shelters that can accommodate livestock.

Box 2: Digital solutions for healthcare- India's National Digital Health Mission

The National Health Policy of India (2017) aims to attain the highest level of health and well-being for all and emphasizes the importance of using digital technologies for healthcare services to increase efficiency and ensure effective delivery. Despite subsequent efforts to deploy technology for healthcare, the benefits were highly localized and fragmented.

To address these issues, in 2019 the Ministry of Health and Family Welfare set up the National Digital Health Blueprint. The blueprint's principle is: 'think big, start small, scale fast', and is the basis for a phased implementation of a National Digital Health Ecosystem and supports:

1. Establishing and managing core digital health data and the infrastructure required for its seamless exchange;
2. Promoting the adoption of open standards by all actors in the National Digital Health Eco-system, for developing several digital health systems that span across the sector from wellness to disease management;
3. Creating a system of personal health records, based on international standards, and easily accessible to citizens and to the service providers, based on citizen consent;
4. Promoting health data analytics and medical research;
5. Leveraging the information systems already existing in the health sector.

Source: Government of India, Ministry of Health & Family Welfare eHealth Section. (2019). National Digital Health Blueprint. Available at https://www.nhp.gov.in/NHPfiles/National_Digital_Health_Blueprint_Report_comments_invited.pdf

Box 3: New technologies protect slum communities

Many of India's urban poor live in informal settlements on low-lying land. Each year they have to endure the impacts of monsoons, with the subsequent flooding, waterlogging, and outbreaks of vector-borne diseases. In 2020 they were also hit with COVID-19 which was able to spread rapidly in communities that were unable to practice social distancing, while the lockdown also stopped most employment for people working in the informal sector.

One of the world's largest slums is Dharavi in Mumbai which in April 2020 reported sharp spikes in COVID-19 cases. Nevertheless, the response to the pandemic has been impressive. The slum has received considerable attention from the Government, the Brihanmumbai Municipal Corporation authorities, NGOs, media and the public. Everyone in Dharavi is being tested, many of them in quarantine centres. The BMC has stationed many mobile dispensaries in Dharavi to screen residents, while doctors are distributing zinc and vitamin tablets to boost people's immunity.

In addition, the Government has established a group of community health practitioners, people who are recruited for training and dispatched into communities in Dharavi. These practitioners have amplified the impact of health and social innovations to contain the spread of the virus while also responding effectively to the other natural hazards.

Source: News 18, India. (July 20, 2020). Amid coronavirus and cyclones, Dharavi is just a canary in a coalmine for megacity slums. Available at <https://www.news18.com/news/india/amid-coronavirus-and-cyclone-nisarga-dharavi-is-just-a-canary-in-a-coal-mine-for-megacity-slums-2651105.html>Critical areas of investment to outpace natural and biological hazard risk

4. Key Investments to Outpace Natural and Biological Hazard Risks

Following the combined impacts of COVID-19 and hydrometeorological disasters, governments in South Asia are determined to build back better and ensure that future strategies and policies address systemic and interrelated risks. For this purpose, there are several key areas where additional investments will yield the largest dividends.

Early warning systems for multiple hazards

South Asia's cyclone early warning systems have showcased the potential for adapting existing mechanisms to complex hazards. Faced with the added challenge of COVID-19 governments revised the protocols for cyclone response, increased the availability of shelters, informed stakeholders at all levels, adapted early warning systems incorporating COVID-19, and provided additional equipment in cyclone shelters, as well as taking steps to facilitate social distancing.

More efforts are needed in this area to build back better. In particular, early warning systems in both health and disaster management need to be updated with the latest risk information. Instead of having separate systems for floods, earthquakes, droughts, or cyclones governments need to build

comprehensive all-hazard plans that deal with multiple and compounded risks and the intersections of vulnerabilities and impacts.

Early warning systems for health, for example, should also be based on meteorological parameters since changes in rainfall and temperature patterns increase the incidences of many diseases. Adapting these systems for cascading disasters can also benefit vulnerable populations like migrants and women. Risk assessments should consider the movements of people, with information on their gender, employment, and livelihoods. This will support disaster-responsive social protection, mitigate gender-based discrimination and reduce the vulnerabilities of women-headed households.

Open science policy and forums to democratize technology

To harness the full benefits of digital technologies, they should be introduced and managed in a democratic way. Many more people are already involved as users of technology – through disease surveillance, testing, contact tracing, and quarantine for COVID-19. However, democratizing technology should also embrace the exchange of knowledge

and information through open science policies and forums, while empowering local people and building on aspects of 'citizen science'. There should also be opportunities for regional collaboration in training, and in sharing and acting on timely information, as well as for learning from setbacks and successes.

Index-based insurance

Only a small fraction of South Asia disaster losses are insured. The region can build on successful schemes such as IWMI's index-based insurance which can be extended to incorporate multiple risk factors, including pandemics, for insurance pricing.

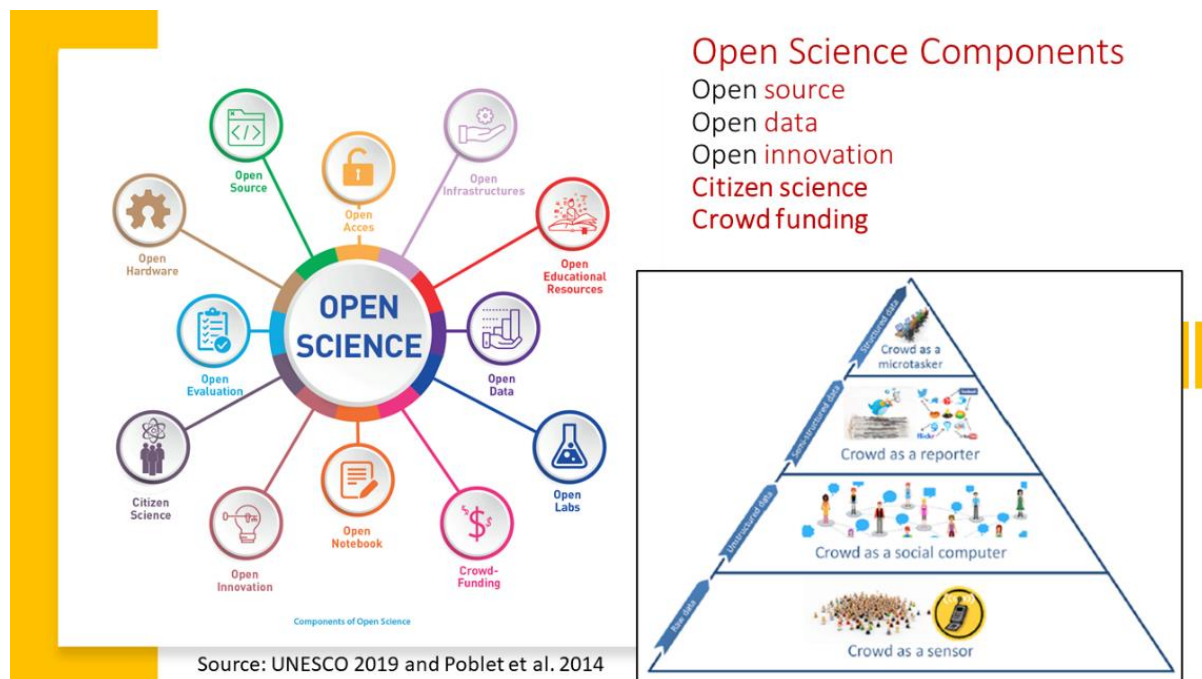
This can not only prevent economic hardship during and post disaster, but also speed up rebuilding and recovery – providing communities with funds to incorporate hazard mitigation into rebuilding efforts.

A regional social innovation ecosystem

Social innovations, both digital and non-digital, can be scaled up by establishing a regional social innovation ecosystem (Figure 5). This would be based on open-source software, open data, citizen science, and crowdfunding. A regional innovations ecosystem can bring new technologies to at-risk communities which can use them in unique and

customized ways to amplify the benefits of innovations. Such an ecosystem can extend and deepen ties among diverse stakeholders, including regional and sub-regional organizations, academia, private sector, SMEs, communities, and local governments.

Figure 5 - Build a regional social innovation ecosystem for disaster risk reduction



5. Key opportunities for regional cooperation

The concurrence of the pandemic, floods, and cyclones has forcefully demonstrated that disasters know no boundaries. Investing in risk reduction requires not just national action but also regional and sub-regional cooperation – for which governments in South Asia can take advantage of a number of international achievements and agreements. They can now:

A regional social innovation ecosystem

Faced with the COVID-19 pandemics, the global community is waking up to the notion of “build back better”. For the disaster risk community, however, this is already an ingrained concept. It comprises four priority areas in the global agreement on disasters – the Sendai Framework for Disaster Risk Reduction. Policy makers for disaster risk reduction thus already have an understanding of the mechanics of building back and have established strengths. They can adapt and use global and national frameworks to help countries increase national capacity for disaster and health emergency risk management. For better management of disaster and health systems, the following frameworks can be called upon:

- *The Sendai Framework for Disaster Risk Reduction* – The health aspects of this global framework for the period 2015-2030 call for enhanced cooperation between health authorities and stakeholders at global and regional levels. The aim is to strengthen national capacity for disaster risk management implementing international health regulations and building resilient health systems. Useful tools for integrated emergency and preparedness systems include the Bangkok Principles of implementation of the health-aspects of the Sendai Framework, and the ministerial-

- level Delhi Declaration on Emergency Preparedness adopted in September 2019.
- *The Sustainable Development Goals* – SDG goal three aims for healthy lives and well-being for all. Target D in goal three calls for strengthening the capacity of developing countries for early warning systems, risk reduction and the management of national and global health risks.
- *WHO frameworks* – 196 WHO Member States have adopted the International Health Regulations (2005) and the National Action Plan for Health Security. These are legal frameworks designed to assess country capacity to prevent, detect, and rapidly respond to public health threats.
- *The Five-Year Regional Strategic Plan to Strengthen Public Health Preparedness and Response – 2019-2023* – This is a WHO regional adaptation of the global plan. Its three-pillars approach is designed to work at all levels to enhance emergency, preparedness and response and increase health security.

Along with national action plans, these global frameworks can guide governments towards more comprehensive management and preparation for all disasters.

Promote disaster risk reduction as a public good

Early warning systems and resilient infrastructure are essential public goods and should be promoted as such – and financed by public investment. These are cost-effective investments that can bring huge dividends by building resilience, minimizing loss of life, and accelerating recovery.

For building risk-informed and resilient infrastructure, countries in South Asia can benefit from the Coalition for Disaster Resilient

Infrastructure. Launched by India, this provides research and enables information sharing on infrastructure risk management. It is now clear that infrastructure assessments will need to expand the range of risks they cover. Traditional disaster risk assessments for public infrastructure projects have just started to allow for climate change, but will also have to incorporate biological hazards like pandemics

Use existing cooperation mechanisms

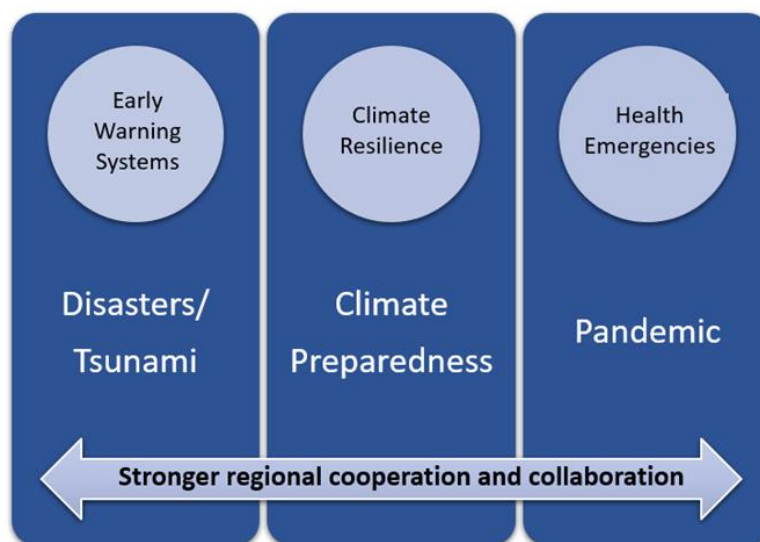
Countries in South Asia can take advantage of a number of regional and subregional cooperation mechanisms. These include the South Asian Association for Regional Cooperation (SAARC), the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation, ESCAP's Asia Pacific Disaster Resilience Network, and the South Asia SDG Forum.

These cooperation mechanisms can be used to generate knowledge and advances in good practices. One example is Nepal's decentralized disaster management system, which has been providing multi-sectoral, on-the-ground support to save lives and preserve jobs and livelihoods. This has focussed particularly on local-level action. The National Disaster Management Authority of Nepal

has provided local governments with risk assessment tools and post-recovery frameworks that can be customized for individual localities. The Authority is also helping establish local disaster risk reduction funds and disaster management committees within the local governments while coordinating with health ministries at the central level to support the additional needs of populations, including the distribution of relief packages. These success stories should be part of a regional knowledge base.

Governments can also utilize existing regional cooperation mechanisms for establishing integrated multi-hazard early warning systems which can have huge benefits, not just for one country but for the entire subregion (6).

Figure 6 Regional cooperation mechanisms for pandemic preparedness, better recovery, and resilience



- Pooling of regional resources, technologies and innovations-risk analytics, telemedicine, tele-education and remote learning
- Complement regional/sub-regional initiatives for combatting the COVID-19

Of particular importance is the Asia Pacific Disaster Resilience Network (APDRN). This was established by ESCAP to support integrated multi-hazard early warning systems and close the gaps in multi-hazard risk assessment and early warning systems (Figure 7). As a network of networks, the APDRN mobilizes expertise and resources to establish multi-hazard early warning systems. The network is built around four work streams:

1. *Early warning systems* – The network has already mobilized regional cooperation around early warning systems for tropical cyclones under the WMO/ESCAP Panel on Tropical Cyclones. It is also in the process of developing early warning systems for slow-onset disasters such as floods and drought, and will also add biological hazards.
2. *Knowledge for policy* – Under the network, ESCAP produces a host of thematic knowledge products including the biennial

Asia Pacific Disaster Report. These thematic knowledge products will be broadened to include integrated natural and biological hazard risk analytics.

3. *Technology innovations and applications* – The network brings together space data applications, artificial intelligence, and digital connectivity for disaster management. The components of this workstream can be expanded to include both health and disaster management.
4. *Data and statistics, geospatial information* – The network assembles under one platform geospatial information and services for disasters, disaster-related statistics, and big data analytics for identifying disaster risk hotspots, scenario-based risk analysis etc.
5. *Disaster and health nexus* -This platform will now include health-related data, developing the cascading risk scenarios and close the gaps in integrated analytics from multiple data sources.

Figure 7 Asia Pacific Disaster Resilience Network- a network of networks



The APDRN has already delivered a series of products and services related to cascading risk scenarios at the time since COVID-19 pandemic and climate extremes are on risk in South Asia and served the basis of well-informed webinars with key stakeholders (Figure 8).

Figure 8 Asia-Pacific Disaster Resilience Network- products and services related to cascading risks scenarios- COVID-19 and Climate Extremes in South Asia



The APDRN has been activated to support building cascading risk scenarios that take into account converging biological and natural hazard risks. In particular, the APDRN study on scenario-based risk analytics for managing cascading disasters presents a methodology to develop an integrated scenario assessment for strategic management and policy development in South Asia (Figure 9).

Figure 9 Methodological framework for developing cascading risk scenarios



If governments across the region are to withstand future cascading and converging disasters, they will need to close the gaps and weave stronger economic and social fabrics. The recovery process from the current cascading disasters provide a fresh impetus for action. Multi-sector and multi-stakeholder integration of disaster management and health systems will help build resilience, protect development gains, and fulfil the aspirations of the

Sustainable Development Goals. In this regard, the South Asia SDG Forum presents an opportunity for key stakeholders including high level officials and ministers to engage in collective policy dialogues. Together they can shape a regional co-operation architecture for managing the cascading impacts of systemic risk within the framework of the 2030 Agenda for Sustainable Development.

6. Recommendations of the Special High-Level Event on Disaster and Climate Resilience in South Asia

On 4 December 2020, the UN Economic and Social Commission for Asia and the Pacific (UNESCAP) convened a Special High-Level Event on Disaster and Climate Resilience in South Asia. This virtual event was attended by Ministers dealing with environment/ disaster management in five South Asian countries: Afghanistan, Bangladesh, India, the Maldives, and Pakistan, along with

directors/heads of the SAARC Secretariat, the Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES), the BIMSTEC Centre on Weather and Climate (BCWC), the National Institute of Disaster Management (NIDM), India, and the Asian and Pacific Centre for the Development of Disaster Information Management (APDIM) addressed the meeting.



The meeting discussed opportunities and imperatives to overcome the challenges in implementing a systemic approach to disaster and public health risk management amidst the COVID-19 pandemic. It also considered strategies to capitalize on existing regional and sub-regional cooperation mechanisms including the South Asia Forum on SDGs, to scale up multi-hazard and multi-sectoral preparedness systems for future cascading disaster risks.

The meeting made the following recommendations:

- a. Develop a new regional framework and strategic action plan for managing cascading risks from natural and biological hazards through cooperation with sub-regional bodies such as SAARC or BIMSTEC to shape a longer-term, holistic, coordinated and more strategic approach to building disaster and climate resilience aligned with the Sustainable Development Goals, the Paris Agreement and the Sendai Framework for Disaster Risk Reduction.
- b. The regional framework can deepen existing cooperation between different subregional/regional institutions, scale up mitigation and adaptation efforts, enhance knowledge and technology for a post-COVID-19 green recovery and capitalize on South Asia SDG forum. A network of knowledge institutions namely, NIDM, APDIM, BCWC and RIMES offered their support to operationalize the framework through their respective mandates for specialized training, capacity development and information management in South Asia.
- c. Given their role as the host of the RIMES Secretariat, Maldives offered to play an enabling role and deepen regional co-operation in South Asia through RIMES services in the areas of disaster and climate resilience.
- d. Highlighting that climate-proofing multi-sectoral development planning and financing are key to achieving 2030 Agenda for Sustainable Development in South Asia, RIMES proposed to partner with UNESCAP's South and South West Asia Office to assist the South Asian countries in implementing and monitoring climate and disaster resilience for attaining SDGs. RIMES also reported on the linkages between the South Asia Hydromet Forum and the South Asia SDG Forum, and informed on the progress made in establishing national climate adaptation offices.
- e. The SAARC Secretariat expressed interest in remaining engaged with the South Asia Forum on SDGs and in developing a SAARC regional cooperation framework to address shared disaster vulnerabilities and exchange good practices in the region to further shape the SAARC Vision.
- f. Further scaling up of the Asia Pacific Disaster Resilience Network to support the proposed regional co-operation framework to manage cascading disasters in South Asia was requested. Afghanistan offered to serve as a pilot country for this initiative and noted further that the role of UNESCAP will be important in shaping South Asia's disaster, climate, and health resilience perspectives, including through coordination with the Economic Co-operation Organisation, The Heart of Asia – Istanbul Process, among other partners.
- g. UNESCAP was requested to initiate the necessary steps and collaborate with key stakeholders, including the SAARC and BIMSTEC Secretariats for implementation of the above recommendations.

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