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Review of the implementation of the 2030 Agenda for Sustainable Development in Asia and the Pacific and issues pertinent to the subsidiary structure of the Commission: Committee on Disaster Risk Reduction

Pathways for managing systemic risks in Asia and the Pacific: regional and subregional approaches

Note by the secretariat

Summary

The coronavirus disease (COVID-19) pandemic started as a health emergency but it has evolved into an economic and human crisis with global coverage and severe local impacts. In order to build back better for a more equal, resilient and sustainable region post COVID-19, the systemic risks emerging from the intersection of multiple natural and biological hazards need to be considered and addressed. Until now, the discourse on these risks has been siloed, resulting in major gaps in economic and social preparedness, as seen in the context of the current crisis.

The present document demonstrates how the systemic and cascading risks emerging from the intersection of multiple natural and biological hazards have expanded the disaster riskscape of the region. It will capture some of the subregional specificities of the new risk hotspots and illustrate how emerging technologies can strengthen management of systemic risks. Finally, the document contains highlights of key solution-oriented approaches, including those provided by regional and subregional cooperation approaches under the aegis of the Asia-Pacific Disaster Resilience Network.

The Economic and Social Commission for Asia and the Pacific is invited to consider the issues raised and provide guidance to the secretariat on its future work.

I. Introduction

1. The Asia-Pacific region is the most disaster-prone region in the world, with disaster risks increasing in severity, scale and frequency. The coronavirus disease that emerged in 2019, COVID-19, has added to the risks that prevail in the region. While the region is no stranger to disasters, the intersection of the pandemic with cyclones, monsoons and other natural disasters has created challenges that the region has not dealt with before.

* ESCAP/77/L.1.

2. In May 2020, India and Bangladesh were struck by Cyclone Amphan, the most powerful cyclone in those countries in 20 years, which claimed more than 100 lives and destroyed the homes and livelihoods of thousands of families. Then in June, Cyclone Nisarga hit the west coast of India. In addition, during the spring, swarms of desert locusts infested South-West Asia and countries struggled to cope amidst the pandemic.[1]

3. The cascading impacts were also evident during the heavy monsoon floods in South Asia. In places like north-eastern India and Nepal, nearly 4 million people have been displaced by heavy flooding, with the death toll rising to almost 200. In the State of Assam, India, for example, almost 22,000 COVID-19 cases have been recorded; with the heavy monsoon flooding affecting 28 districts and uprooting more than 51,000 people, the State had the highest single-day spike, 1,218, of cases during the heaviest floods.[2] Responding to the multiple challenges of cascading disasters has been complex, lockdowns have made it difficult for relief to get through and when COVID-19 care centres doubled as shelters, ensuring social distancing and wearing masks became difficult.

4. While the causes and physical characteristics of pandemics and disasters are very different, both shocks have struck in the same geographical space and time in several countries. The virus has affected high population density areas and has had serious impacts for disaster risk management and on vulnerable groups, including persons with disabilities, female-headed households and indigenous population groups, as well as people's livelihoods.

5. The present document contains information on how the systemic and cascading risks emerging from the intersection of multiple natural and biological hazards have expanded the disaster riskscape of the region. Subregional specificities of the new risk hotspots are noted as are the ways emerging technologies can strengthen management of systemic risks. Finally, the document contains highlights of key solution-oriented approaches, including those provided by regional and subregional cooperation approaches under the aegis of the Asia-Pacific Disaster Resilience Network.

II. A region at risk: the cascading disaster riskscape and convergence into multi-hazard hotspots

6. In 2020, climate extremes collided with the COVID-19 pandemic to create cascading disasters with wide-ranging impacts on sectors, economies and populations. A new landscape of cascading risks is now emerging. In 2020, climate-related hazards were responsible for 99 per cent of the people affected by disasters and 97 per cent of the deaths. Of these deaths, floods contributed to 66 per cent, followed by tropical cyclones (16 per cent) and landslides (15 per cent). In total, climate-related disasters affected more than 75 million people and killed almost 6,000. Additionally, COVID-19 infected 21 million people and killed 365,925. While deaths due to climate extremes are just 1.5 per cent of those due to COVID-19, the former impacted three times more

[1] Economic and Social Commission for Asia and the Pacific (ESCAP), "Investing in innovative solutions to manage cascading disaster risks in South Asia: key takeaways for stakeholders", Asia-Pacific Disaster Resilience Network Policy Study, No. 3/2020 (Bangkok, 2020).

[2] Ibid.

people. Together, the converging disasters killed 371,558 people and affected 96 million.[3]

7. So far, the South and South-West Asia subregion was most impacted; with 48 million people affected and 4,354 killed by cyclones and flooding, together with 15 million people infected and 248,983 killed by COVID-19. In South-East Asia natural disasters affected 15 million people and killed 811, followed by East and North-East Asia (12 million affected, 355 deaths), the Pacific (83,000 affected, 69 deaths), and North and Central Asia (110,000 affected, 6 deaths). Meanwhile, South-East Asia recorded 35,528 deaths and 1.6 million infections from COVID-19, with East and North-East Asia following closely with 9,206 deaths and 409,136 infections.[4]

8. The five countries now at most risk from cascading disaster risks arising from the convergence of natural and biological hazards are India, Bangladesh, Indonesia, Pakistan and the Philippines. Additional countries that have been impacted by both natural disasters and COVID-19 include Afghanistan, China, the Islamic Republic of Iran, Japan, Myanmar, the Russian Federation, Turkey and Viet Nam. The impacts of COVID-19 in disaster-risk hotspots such as the Ganges-Brahmaputra and Meghna and Indus River basins, the typhoon corridors of South-East Asia, and the dust belts of South and South-West Asia are expected to push populations living near the poverty line into extreme poverty.[5]

9. With the region already at an elevated disaster risk, the impact of the COVID-19 pandemic and government responses depleted the resources and capacities of health and disaster management systems. The pandemic has very quickly shown the systemic gaps in integrated crisis management and mitigation and Governments are recognizing that the demarcations between natural, biological and other hazards are at best arbitrary. The virus proliferated in high population density areas with significant impacts on vulnerable groups who also suffer from the impacts of natural disasters. With the number and intensity of weather extremes expected to increase due to climate change, another pandemic or other shock of a similar magnitude could decimate already weakened social systems, including those related to health and disaster management.

A. Health and other disasters intersect and interconnect

10. For the past several decades, the Asia-Pacific region has experienced the world's highest human and economic impacts from disasters. This partly corresponds to its size – the region is home to 60 per cent of the world's population and has 40 per cent of the land mass, as well as 36 per cent of global gross domestic product (GDP). Recent data from the Emergency Events Database show that the region is experiencing increasing impacts from climate-related hydrometeorological hazards as well as various biological

[3] ESCAP Blogs, "2020: the year when crises converged", 15 January 2021.

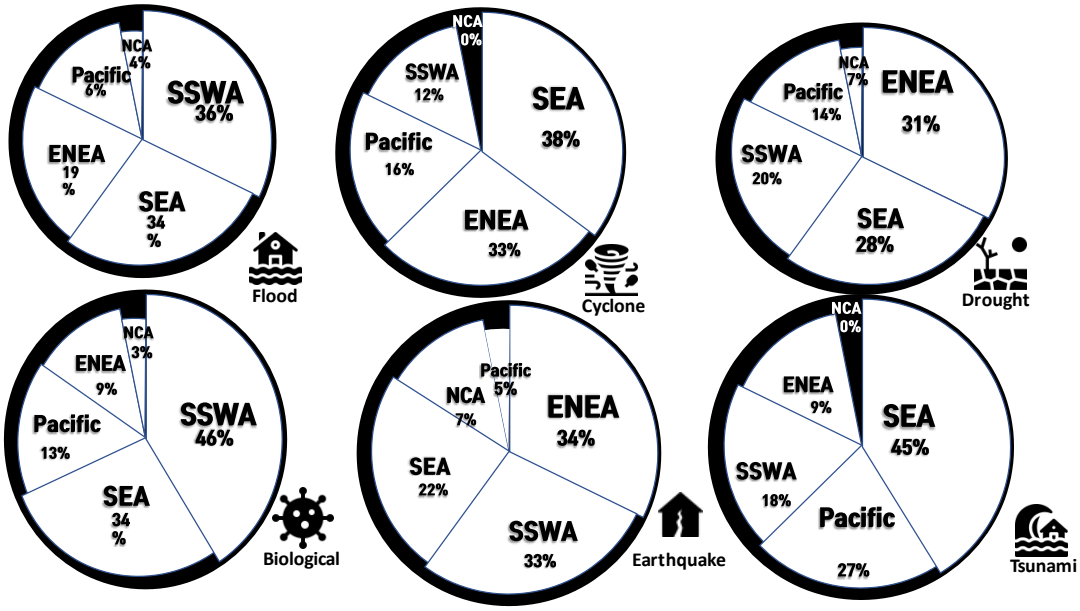
[4] Ibid.

[5] ESCAP calculations based on Centre for Research on the Epidemiology of Disasters, EM-DAT: The International Disaster Database, available at www.emdat.be/; and Johns Hopkins Coronavirus Resource Center, COVID-19 Dashboard by the Center for Systems Science and Engineering at Johns Hopkins University, available at https://coronavirus.jhu.edu/map.html (both accessed on 1 January 2021).

hazards, including vector-borne diseases. The region is also a hotspot of infectious disease emergence.[6]

11. South and South-West Asia and South-East Asia are the most impacted subregions in terms of the number of occurrences and people affected by hydrometeorological and biological hazards, followed by East and North-East Asia, the Pacific, and North and Central Asia (figure).

Multi-hazard profile for Asia-Pacific subregions, 2000 to 2020



Source: ESCAP, "Scenario-based risk analytics for managing cascading disasters: a pathway to manage risks and protect people in South Asia", Asia-Pacific Disaster Report 2021 Working Paper, No. 1 (Bangkok, 2020).

Abbreviations: ENEA, East and North-East Asia; NCA, North and Central Asia; SEA, South-East Asia; SSWA, South and South-West Asia.

B. Risk drivers contribute to and exacerbate impacts of cascading hazards

12. The underlying risk drivers that exacerbate the impacts of natural and biological hazards include poverty, inequality and unsustainable use of natural resources. Climate change especially is not only a hazard in and of itself but is also a risk driver, increasing the interactions of and impacts between biological and natural hazards. In addition, climate change exacerbates the intensity of extreme weather events with compounding impacts on populations and economies.[7] The Intergovernmental Panel on Climate Change, in its fifth assessment report, notes that climatic variations will not only increase floods, monsoons and drought but will also create new ecological niches for both vector-borne and zoonotic diseases, thereby altering the temporal and spatial distribution of diseases. Risks from some vector-borne diseases, such as

[6] Serge Morand and others, "Infectious diseases and their outbreaks in Asia-Pacific: biodiversity and its regulation loss matter", *PLoS ONE*, vol. 9, No 2 (25 February 2014).

[7] ESCAP, "Scenario-based risk analytics for managing cascading disasters: a pathway to manage risks and protect people in South Asia".

malaria and dengue fever, will not only increase with warming from 1.5 to 2 degrees Celsius but will also potentially shift their geographic range.[8]

13. Climate change-induced seasonal flooding, for example, is already exposing more and more people to diarrhoeal disease outbreaks, especially children under 5 years of age and to some extent adults, through drainage systems that contaminate clean water sources. This also disrupts the nutritional needs of children in this age group, putting them at risk for moderate and severe malnutrition. Currently, people living in temporary shelters due to flood evacuation also run the risk of measles on top of COVID-19. Future drought situations will also drive the cycle of malnutrition among rural populations due to food insecurity with the risk of severe acute malnutrition. During floods, droughts and pandemics, human health takes a beating, compromising growth, negatively impacting development efforts to eradicate severe acute malnutrition with its impacts on the immune system, adding to mental health woes and psychosocial imbalance, and deepening existing inequalities, as well as sometimes overwhelming health systems depending on the intensity of the disaster and the existing local capacities. Patients with chronic diseases like diabetes, hypertension and kidney ailments end up being affected due to supply chain disruption, during prolonged flooding, due to irregular transportation and follow-up care in endemic and/or pandemic situations. Risk-informed policy and sectoral integration are needed to address these issues. Additionally, global warming will increase the frequency and severity of heat waves with large increases in the number of people exposed to extreme heat, which, in turn, will increase conditions such as heat exhaustion, heat cramps, heat strokes, and cardiovascular and respiratory disorders.[9]

14. In the *Asia-Pacific Disaster Report 2019: The Disaster Riskscape across Asia-Pacific – Pathways for Resilience, Inclusion and Empowerment*, four distinct hotspots were identified where fragile environments are converging with critical socioeconomic vulnerabilities to create potential cascading crises.[10] The first hotspot is located within the transboundary river basins of South and South-East Asia, where poverty, hunger and undernourishment combine with exposure to intensifying floods that alternate with prolonged droughts. The second surrounds the Pacific Ring of Fire, a path along the Pacific Ocean where major cities, transport and information and communications technology (ICT) infrastructure and poor populations are exposed to typhoons and seismic and tsunami hazards. The third is the Pacific small island developing States, where vulnerable populations, fragile ecosystems and critical infrastructure are exposed to climate-related hazards of increasing intensities. A fourth emerging hotspot is the sand and dust storm risk corridor which covers parts of South, South-West, and Central Asia.

15. The newly available data on exposure to COVID-19[11] and disease data from the INFORM Risk Index demonstrate that South and South-West Asia are particularly vulnerable, experiencing high impacts from natural hazards, COVID-19 and other biological disasters (table).

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[8] *Climate Change 2014: Impacts, Adaptation and Vulnerability* (New York, Cambridge University Press, 2014).

[9] ESCAP, "Scenario-based risk analytics for managing cascading disasters: a pathway to manage risks and protect people in South Asia".

[10] United Nations publication, 2019.

[11] Johns Hopkins Coronavirus Resource Center, COVID-19 Dashboard by the Center for Systems Science and Engineering at Johns Hopkins University. Available at https://coronavirus.jhu.edu/map.html (accessed on January 12, 2021).

Four hotspots of converging natural and biological hazard vulnerabilities

Hotspot 1: Flood and drought prone areas/transboundary river basins, COVID-19 and biological hazards		*Hotspot 2: Ring of Fire/earthquakes, landslides, tsunami and typhoon corridors, COVID-19 and biological hazards*	
South and South-East Asia		*North and North-East Asia, some of South-East Asia*	
Population exposure: COVID-19	Very high	Population exposure: COVID-19	Low
Population exposure: vector-borne diseases	Very high	Population exposure: vector-borne diseases	Moderate
Population exposure: natural hazard	Very high (mostly poor people)	Population exposure: natural hazard	Very high (mostly poor people)
Economic stock exposure: natural hazard	High	Economic stock exposure: natural hazard	High
Infrastructure, energy: natural hazard	Low	Infrastructure, energy: natural hazard	Low
Infrastructure transport: natural hazard	Moderate	Infrastructure transport: natural hazard	Moderate
Infrastructure, information and communications technology: natural hazard	Low	Infrastructure, information and communications technology: natural hazard	Low
Hotspot 3: Tropical cyclones, El Niño, earthquakes and landslides, COVID-19 and biological hazards		*Hotspot 4: Sand and dust storm risk corridors, COVID-19 and biological hazards*	
Pacific small island developing States		*South and South-West Asia and Central Asia*	
Population exposure: COVID-19	Low	Population exposure: COVID-19	Very high in South and South-West Asia and context specific in Central Asia
Population exposure: vector-borne diseases	Moderate	Population exposure: vector-borne diseases	Very high
Population exposure: natural hazard	Very high (mostly poor people)	Population exposure: natural hazard	High (mostly poor people)
Economic stock exposure: natural hazard	High	Economic stock exposure: natural hazard	High
Infrastructure, energy: natural hazard	High	Infrastructure, energy: natural hazard	Moderate
Infrastructure transport: natural hazard	Moderate	Infrastructure transport: natural hazard	Moderate
Infrastructure, information and communications technology: natural hazard	Low	Infrastructure, information and communications technology: natural hazard	Low

Source: Adapted from ESCAP, *Asia-Pacific Disaster Report 2019: The Disaster Riskscape across Asia-Pacific – Pathways for Resilience, Inclusion and Empowerment* (United Nations publication, 2019); INFORM Risk Index, available at https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Risk; and Centre for Research on the Epidemiology of Disasters, EM-DAT: The International Disaster Database, available at www.emdat.be/ (both accessed on 11 January 2021).

III. Outpacing cascading risks requires scaled-up investments in science, technology and innovation

16. The roots of resilience lie in managing systemic cascading risks. Therefore, to counter the impacts of these cascading hazards, there are several key areas where scaled-up investments will yield the largest dividends.

17. Continued investments to develop complex risk scenarios and early warning systems that integrate climate science into the larger sustainable development agenda will be essential. Furthermore, advances in climate science need to be incorporated into sustainable development planning processes and enhance the scope of early warning systems. This, however, cannot be achieved without using the tools offered by advances in science, technology and innovation.

18. From enhancing the understanding of virus transmission pathways and the complexity of pandemic risks to managing critical supplies and developing digital platforms for health, science, technology and innovation-based solutions can transform short-term crisis management into long-term resilience building through smart preparedness, economic restructuring, productive diversification and the delivery of social protection.

19. Australia, China, New Zealand, the Republic of Korea, Singapore, Thailand and Viet Nam were among the countries that rapidly gained effectiveness in early detection, rapid diagnostics, timely containment, prevention of spread, and containment.[12] The key lesson is to have an epidemic early warning system with real-time disease surveillance with projected potential exposure and vulnerability to identify at-risk communities for timely interventions. However, highly granular or personal data for public health purposes raise security and privacy concerns that need to be addressed; advances in computational epidemiology, data science and digital health platforms can be helpful in this area.

20. Technological advances, including satellite data, COVID-19 tracing applications, and applications based on geographic information systems (GIS) have provided tools to adapt to the more complex risk scenarios and have helped to produce better risk analytics. In addition, science, technology and innovation are needed to incorporate advances in climate science into development planning and to enhance the scope of early warning systems. These issues are considered in further detail below.

A. Geospatial information for location-based risk analytics

21. The effective integration of geospatial data with existing statistics and ground-based information will be key to delivering the time-sensitive data needed by governments, businesses, communities and citizens to make evidenced-based decisions in the context of cascading risks. Countries within the Asia-Pacific region are already making steady progress on the uses of geospatial information and space applications in the disaster risk management cycle. Through its long-standing Regional Space Applications Programme for Sustainable Development, ESCAP has made concerted efforts to promote the application of space technology to support disaster risk reduction and inclusive and sustainable development.

[12] Sanjay Srivastava, “STI based solution for a resilient future”, *Financial Express*, 10 January 2021.

22. In *Geospatial Practices for Sustainable Development in Asia and the Pacific 2020: A Compendium*, ESCAP demonstrates the diverse uses of geospatial information and applications and the vital role that they will continue to play in the future. The publication is based on more than 100 practices from member States. It showcases the benefits and importance of accessible, available, actionable and affordable geospatial data, tools and innovations to maximize potential benefits. The examples of good practice cover the six priority areas identified in the Asia-Pacific Plan of Action on Space Applications for Sustainable Development (2018–2030), including disaster risk reduction and resilience and cascading risks arising out of the impacts of the COVID-19 pandemic.

23. Integration of space-derived data and land-based information is vital in combating drought. However, there is a lack of resources and capacity to perform such analysis in many drought-prone developing countries. Through the Regional Cooperative Mechanism for Drought Monitoring and Early Warning, which is a flagship programme under the Regional Space Applications Programme for Sustainable Development, timely and free access to space-based data and products and tailored services and capacity-building are provided to drought-affected countries in the region to support evidence-based decisions in response to drought, with direct support from the Governments of China, India, the Russian Federation and Thailand as well as other cooperation partners.

24. This can also translate to strengthening water management, adjusting crop cycles, planting drought-resistant seeds and initiating timely relief measures. Additionally, governments use geospatial data and space applications to support monitoring, response, and preparation with regard to the COVID-19 pandemic. Public and private sectors have collaborated to develop platforms and publish information products, such as web-based maps of confirmed infections, maps of critical infrastructure and supplies, and maps of available routes for medical staff, among others. Many countries have used space applications to support hotspot mapping, contact tracing and early warning systems to strengthen preparedness for COVID-19, as well as other disasters and cascading risks. These applications can also help in the recovery phase to build back better, by providing an evidence base for decisions on the easing of lockdown measures and the resumption of economic and social activities.

B. Building more complex risk scenarios to support targeted actions

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

26. Using various technologies, including machine learning, these scenarios can model not just the vulnerability, exposure and impacts of natural and biological hazards but also the temporal non-linear transitions of biological hazards from one phase to another. The combination of systemic risks and deep uncertainties can be captured in different scenarios. This can help governments to identify the areas which are hotspots of emerging diseases, including those with pandemic potential, for early warning and systemic risk management.

27. The Commission recently demonstrated a prototype developed for Bangladesh that places districts or areas into appropriate risk zones. By integrating data from diverse sources and using a composite risk matrix incorporating endemic, natural and biological hazard risks, it shows the States most exposed to cascading disaster risks.[13] For example, the matrix identifies red-zone districts characterized by overstretched health-care infrastructure that is further affected by wide-scale flooding that not only damages health-care infrastructure but also increases the disease burden due to 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 cooperation between the planning ministries and line ministries responsible for health and disaster management.

C. Incorporating advances in climate science into development planning and integrated early warning systems

28. The experience of managing climate and health disasters against the backdrop of the COVID-19 pandemic has brought to the fore the importance of climate services and the potential of technological advances. Several Governments, such as the Governments of China, Japan and the Republic of Korea, have built seamless models that can produce climate forecasts that range from the smallest scale, such as cities, to the largest, such as the national or global level, and for hours, months or years ahead.[14]

29. This modelling framework is mainly being used for agriculture and water resource management. It has yet to be applied to public health and disaster management. Early warning systems for health, for example, should also be based on meteorological parameters as 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, based on 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. 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 early warning systems for disasters.

D. Developing integrated insurance and financing to support the most vulnerable

30. Larger enterprises and better off households can address disaster risks through insurance, but poorer 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 disasters risks, even in remotes areas.

31. A common application has been through index-based parametric insurance. It bases payouts not on ex post facto verified damage but on a triggering index event such as a drought or a flood of a certain magnitude. Once

[13] ESCAP, “Scenario-based risk analytics for managing cascading disasters: a pathway to manage risks and protect people in South Asia”.

[14] ESCAP, “Pathways to manage cascading risks and protect people in South Asia: key takeaway for stakeholders,” Asia-Pacific Disaster Resilience Network Policy Study, No. 5/2020 (Bangkok, 2020).

the threshold index is passed, those insured receive immediate payments rather than having to wait for individual post-disaster assessments.

32. Parametric insurance has been piloted in many parts of the Asia-Pacific region. The International Water Management Institute, for example, uses advanced computation modelling, remote sensing, crowd sourcing and geospatial-gridded data sets to demonstrate the operational feasibility of parametric insurance in several countries of South Asia.[15] Providers such as Tata American International Group General Insurance Company Limited and Swiss Re Group, as well as others, in partnership with Governments, are making scaling up these insurance plans possible. When scaled up, this innovative solution could strengthen disaster resilience and, when combined with a gender-sensitive response and risk strategy, could help people to become more effective in managing their own risk.[16]

33. In the countries impacted most by COVID-19, the pandemic 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 International Water Management Institute model was adjusted to also incorporate pandemic risk. To manage multiple risks effectively, index-based insurance would, however, need to be complemented with access to seeds, climate information, and increased as well as better communication among farmers, government and various stakeholders.

IV. Subregional solutions to cascading crises through regional cooperation

34. The concurrence of the pandemic, floods and cyclones has amply demonstrated that disasters know no boundaries. Science and technology-driven innovations that scale up early warning systems, supported by complex risk scenarios and integrated financing solutions, require not just national actions but also regional and subregional cooperation, if cascading risks are to be outpaced. Under the Asia-Pacific Disaster Resilience Network, ESCAP has promoted subregional cooperation for cascading disaster risks across its five subregions.

A. South and South-West Asia: developing a new regional framework for managing cascading risks

35. As shown above, while much of the Asia-Pacific region is at risk from the convergence of natural and biological hazards, South and South-West Asia, in particular, is at an extremely high risk from the convergence. Not only does the subregion have high losses from natural disasters, but it also shows high losses from biological disasters.

36. The Commission delivered a series of analytical products and services related to this convergence. Through the Asia-Pacific Disaster Resilience Network, support for building cascading risk scenarios was provided. The Network 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 the subregion.

[15] See https://ibfi.iwmi.org/.

[16] ESCAP, “Investing in innovative solutions to manage cascading disaster risks in South Asia: key takeaways for stakeholders”, Asia-Pacific Disaster Resilience Network Policy Study, No. 3/2020 (Bangkok, 2020).

37. In the specific context of addressing cascading risks and bringing together multiple stakeholders under one discussion platform, ESCAP, with the National Institute of Disaster Management of India, the South Asian Association for Regional Cooperation (SAARC) Tuberculosis and HIV/AIDS Centre, and the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation Centre for Weather and Climate Centre, held an expert webinar series that used the analytical products as an evidence base for experience sharing and coordinating policy responses.

38. The series culminated in a special event on disaster and climate resilience in South Asia, in association with the South Asia Forum on the Sustainable Development Goals.[17] Ministers responsible for environment as well as disaster management from Afghanistan, Bangladesh, India, Maldives and Pakistan, and directors and heads of the SAARC secretariat, the Regional Integrated Multi-Hazard Early Warning System for Africa and Asia, the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation Centre on Weather and Climate Centre, the National Institute of Disaster Management of India, and the Asian and Pacific Centre for the Development of Disaster Information Management participated.

39. The Commission, working in close collaboration with subregional organizations, notably SAARC, was asked to support the development of a new regional framework and strategic action plan for managing cascading risks from natural and biological hazards. Furthermore, with SAARC, the Economic Cooperation Organization and the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation, the secretariat was asked to help to shape a longer-term, holistic, coordinated and more strategic approach to building disaster and climate resilience that is aligned with the Sustainable Development Goals, the Paris Agreement and the Sendai Framework for Disaster Risk Reduction 2015–2030.

B. South-East Asia: managing risks from the coronavirus disease and drought through a new plan of action

40. The Commission, acting as lead for the work programme on risk awareness and assessment of the Joint Strategic Plan of Action on Disaster Management (for the periods 2016–2020 and 2021–2025), together with the Association of Southeast Asian Nations (ASEAN) secretariat, published the *Ready for the Dry Years: Building Resilience to Drought in South-East Asia* publication series. By providing evidence for intensifying drought risk, and by assessing present and future patterns of drought hazard exposure and vulnerability, the series has supported ASEAN member States in coordinating their policy responses and preparedness.

41. The second edition of the publication,[18] released in November 2020, highlighted the sectors that were hardest hit by agriculture and food security disasters as well as the emerging vulnerabilities of households relying on incomes from rural agriculture and urban-rural migration. The publication also contained information on how fiscal stimulus packages for COVID-19 recovery could strengthen resilience to future droughts. In this regard, the importance of cross-sectoral initiatives for drought adaptation and

[17] ESCAP, "Weaving a stronger fabric: managing cascading risks for the climate resilience", Asia-Pacific Disaster Resilience Network Policy Study, No. 8/2021 (Bangkok, 2021).

[18] *Ready for the Dry Years: Building Resilience to Drought in South-East Asia – Second Edition.*

addressing human and ecosystem vulnerabilities in drought hotspots to reduce converging risks were underlined.

42. The information in the publication was helpful for the adoption of the ASEAN Declaration on the Strengthening of Adaptation to Drought at the thirty-seventh ASEAN Summit in November 2020. The ESCAP and ASEAN secretariats are now developing a follow-up plan of action for the Declaration.

C. Pacific: increasing resilience to cascading hazards through disaster-responsive social protection systems

43. People living in the Pacific small island developing States experience the highest vulnerability to natural hazards. To protect people and their livelihoods in this subregion, ESCAP, with the Government of Samoa, developed a policy brief series entitled "Disaster-responsive social protection: policy brief for the Pacific small island developing States". For example, Cyclone Evan, which struck Samoa in 2012, caused damages and losses equivalent to 29 per cent of national GDP; most of the losses occurred in the social and productive sectors.[19] Thus, in this subregion, increasing government investments in social protection will be crucial to mitigate the impacts from disasters, high levels of unemployment and COVID-19 economic fallout.

44. The policy brief series supports the development of well-designed disaster responsive social protection systems through cross-sectoral and institutional coordination. Increasing investments is just as important as investing strategically because predictable and adequate finance contribute to the credibility and success of disaster responsive social protection systems and may be achieved through innovative measures, such as strengthening linkages with contingency reserves, insurance schemes and aligning social protection with the priorities of climate finance. As noted above, advances in science, technology and innovation should further be capitalized upon to improve the design, coordination and delivery of disaster responsive social protection services. These key considerations were highlighted in the first policy brief in the series, which was co-published with the Samoa Ministry of Natural Resources and Environment in 2020.

D. East and North-East Asia: responding to cascading hazards through integrated impact-based forecasting in climate outlook forums

45. Using the most advanced early warning systems, East and North-East Asia has been a leader in reducing the number of fatalities from natural disasters. However, it is still one of the subregions most exposed to disasters in terms of economic assets, reflected by the $409 billion average annual losses, and the subregion's economic losses, particularly from climate-related hazards (tropical cyclones, floods, drought and heatwaves) continue to grow.[20] With the advent of COVID-19 as a converging biological hazard, the subregion has also shown that integrated disaster and health early warning systems are critical in mitigating economic losses from all hazards.

[19] Samoa and others, *SAMOA Post-disaster Needs Assessment: Cyclone Evan 2012* (Samoa, 2013).

[20] *Asia-Pacific Disaster Report 2019: The Disaster Riskscape across Asia-Pacific – Pathways for Resilience, Inclusion and Empowerment* (United Nations publication, 2019).

46. In this context, ESCAP has been promoting impact-based forecasting in climate outlook forums that support better and more integrated early warning systems. The secretariat developed a novel methodological approach that signals the evolution from the conceptual model of "What the weather will be" to "What the weather will do" for risk-sensitive sectors, including health, food security and energy. The methodology, in the form of seasonal outlooks,[21] can now be used by sectoral ministries to better prepare for future cascading hazards.

E. North and Central Asia: restoring and strengthening supply chains and connectivity through disaster resilience

47. The Commission, through a United Nations Development Account project, is addressing the challenges of strengthening supply chains in North and Central Asia to build resilience to multiple disasters. With a specific focus on building disaster resilient energy, transport and ICT infrastructure, ESCAP held several consultations with policymakers in the project's three pilot countries (Kazakhstan, Kyrgyzstan and Mongolia) to identify measures and strategies to ensure inclusive and sustainable development.

48. Recognizing the importance of resilient infrastructure for connectivity in the subregion, ESCAP has developed products that support the risk assessment of complex transboundary challenges to and vulnerabilities of these sectors, which have been used for capacity development activities in North and Central Asia. Specifically, the analytical products are used to identify areas of risk hotspots in the subregion that may require additional risk-informed investments in transboundary infrastructure development. This will be key for the subregion to achieve the Sustainable Development Goals and to ensure that poor and vulnerable people as well as isolated communities are not left behind.[22]

V. Issues for consideration by the Commission

49. Considering the cascading riskscape that has emerged during the pandemic, drawing from subregional initiatives discussed in section IV above, and in preparation for the seventh session of the Committee on Disaster Risk Reduction, scheduled to be held in August 2021, the secretariat will continue, under the Asia-Pacific Disaster Resilience Network, to respond to imminent and cross-cutting challenges by deepening regional cooperation through the adoption of subregional approaches. In particular, the secretariat plans to take the following actions:

(a) In collaboration with the ASEAN secretariat, develop a follow-up regional action plan to the ASEAN Declaration on the Strengthening of Adaptation to Drought;

(b) In collaboration with the SAARC secretariat and with the support of the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation, scale up regional cooperation by drafting a new framework and strategic action plan for managing cascading risks from natural and biological

[21] ESCAP, "Seasonal outlook to socioeconomic impact based forecasting: proposed methodology and key results – building on the seasonal forecasts of South Asian Climate Outlook Forums 2020", Asia-Pacific Disaster Report 2021 Working Paper, No. 2 (Bangkok, 2020).

[22] ESCAP, "Multi-hazard risk to exposed stock and critical infrastructure in Central Asia", Asia-Pacific Information Superhighway (AP-IS) Working Paper Series (Bangkok, 2020).

hazards. In collaboration with the Economic Cooperation Organization, build a partnership to expand the geographic coverage and scale up the management of cascading risks including through coordination with the Istanbul Process on Regional Security and Cooperation for a Secure and Stable Afghanistan (Heart of Asia – Istanbul Process), among other partners;

(c) In North and Central Asia, continue to deepen analysis of risk-sensitive development strategies, particularly those related to addressing shared vulnerabilities through regional economic cooperation and integration;

(d) In East and North-East Asia, capitalize on advances in risk analytics and climate sciences for multi-hazard impact forecasting in partnership with the World Meteorological Organization and others;

(e) In the Pacific, continue to support the operationalization of disaster-responsive social protection systems through cross-sectoral and institutional coordination.

50. The Commission is invited to provide guidance to the secretariat on its future work, including the priority areas and partnerships listed above, with a view to strengthening regional and subregional cooperation in the area of disaster risk reduction.