Resilience across the riskscape

Millions of people across Asia and the Pacific remain vulnerable to disasters. Those most exposed are often in remote areas, or who belong to minority groups or live on the fragile margins of big cities, with little defence against disasters and in danger of being left behind. But with sufficient effort and investment, and support at both national and regional levels, it is possible to extend protection to everyone in order to achieve resilience across the riskscape.

In adopting the 2030 Agenda for Sustainable Development, United Nations Member States pledged to ensure "no one will be left behind" and to "endeavour to reach the furthest behind first". Usually these are people who have been discriminated against, marginalized or excluded in the process of development, notably the poor, women, children, the disabled, the aged, migrants and other ethnic, religious, or linguistic minorities.

The Asia-Pacific region is now in the fourth year of implementing the 2030 Agenda for Sustainable Development. Progress has been mixed. The region is an economic powerhouse but economic growth in the region has come at a cost of social inclusiveness.[210] For the cluster of goals related to inequality and environmental degradation the region is moving backwards. This is based on evidence from the ESCAP SDG Progress Report 2019,[211] and evidence from voluntary national reviews.[212]

The evidence shows that for the bottom 10 per cent income group in the region, their income has doubled since the 1980s. However, the pace of their income growth is slower than that of the middle 40 per cent and of the top 10 per cent, and much slower than the top 1 per cent income group.[213] An important contribution to these disparities is the impact of recurring disasters. Track six of the United Nations Secretary-General Climate Action is 'the Resilience and Adaptation Pact' which aims for a fundamental shift in investments and behaviour. In the region's riskscape where nearly 85 per cent

is occupied by climate-related disasters, such as floods and cyclone, concerted actions under 'the Resilience and Adaptation Pact' will go a long way towards achieving the 2030 Agenda for Sustainable Development (Box 5-1).

This report offers the first comprehensive riskscape for the region, as well as showing the impacts of disaster risk on poverty and inequality. Chapter 2 identified those likely to be left furthest behind. These include women in households in the bottom 20 per cent of the wealth bracket, who are employed in agriculture, and have more than two children and have little voice in their households. When hit by disasters, such groups are likely to become even poorer, with a rise in inequality.

Acceleration towards many of the SDGs will mean further empowering people and ensuring their inclusion.[214] The sixth Asia-Pacific Forum on Sustainable Development highlights the need to mobilize actions around four areas: rights and justice; norms and institutions; resources and capabilities; participation and voice. A further source of guidance should be the United Nations Secretary-General's Conference on Climate Action (Box 5-1).[215]

A way forward: opportunities for action

Increasing disaster resilience for all excluded groups will require action across three broad areas. First, to ensure that all policies and investments are risk-informed, notably in education, health, social protection, agriculture and infrastructure. Second, to capitalize on industry 4.0 technologies. Third, to unlock the potential of regional cooperation.

BOX 5-1 United Nations Secretary-General's Climate Action 2019

On 23 September 2019, the Secretary-General of the United Nations will host the Climate Action Summit in New York to accelerate action to implement the Paris Agreement.[a] Track 6 of the Secretary General Climate Action is 'the Resilience and Adaptation Pact' which aims for a fundamental shift in investments and behaviour. The pact aims to seek cross-sector commitment at the highest level to bring adaptation action to global scale. It will aim for:

· Resilient people: allow investment (both private and public) to adapt and to build resilience where it is most needed; including financial and technical support to build capacity of the most vulnerable.

· Resilient economies: integrate adaptation into norms, policies and long-term low-emission development strategies and embed climate risk and opportunities through all public and private planning, investment and financing.

· Resilient food and land-use: reduce land degradation and provide food security.

· Preparing for, and responding, to disasters/shocks: including preparatory financing, early warning systems, and insurance.

a   United Nations Climate Action Summit (2019).

1 Implement risk-informed policies and investments

Policies and investments must be risk-informed but also tailored to local circumstances. In some hotspots, high-disaster risk is compounded by high levels of poverty and inequality. Here it will be important to ensure risk-informed services of social protection, education and health along with resilient agriculture and infrastructure. In other hotspots, disaster risk is closely linked with environmental fragility, so policies and investments need to be coupled with environmental protection and ecosystem restoration.

Many Governments across the region have already taken major steps in this direction; investing in the social sectors as part of pro-poor growth strategies. But if growth is to be inclusive, Governments need to go further and encompass disaster resilience. At the national scale this means developing a comprehensive portfolio of sectoral investments and policies that collectively address the differentiated risk profiles. The traditional approach has been to consider these as separate policy domains. Instead, to promote disaster resilience, multiple ministries should collaborate to align their plans, as well as their financing, monitoring and reporting systems. Different interventions may be necessary for different groups, according to their unique vulnerabilities and capacities.

2 Capitalize on new technologies

Disaster reduction can now make greater use of big data techniques for analysing very large data sets to reveal patterns, trends, and associations. In the case of early warning systems, big data can fill critical gaps and allow impact-based, risk-informed, people-centred and end-to-end early warning services down to community level. It also helps the transition from early warning to early action when used for forecast-based financing, forecast-based social protection and risk prevention.

Resilience building relies upon many different data types and information sources. Industry 4.0 technologies can also assist here through machine learning, which enables actions to be analysed and used rapidly, sometimes in near real time as well as for generating multiple risk scenarios. New technologies can also identify and count the excluded, the poorest and the most vulnerable, through the use of satellite imagery and geospatial disaggregation. Disaster risk reduction should now

be grounded on a seamlessly integrated system that comprises big data, risk analytics and digital identity. But there are always risks that the technology might be used in damaging ways, so it will be important to tailor the framework to address disaster response and resilience-building measures in an inclusive and participatory manner (Figure 5-1).

Disaster resilience is increasingly reliant on space and geospatial information. In 2018, the third Ministerial Conference on Space Applications for Sustainable Development in Asia and the Pacific pledged to continue to work collectively towards using space and geospatial information applications in disaster risk reduction. Three core implementation modalities were identified: (a) research and knowledge-sharing; (b) capacity-building and technical support; and (c) intergovernmental discussions and regional practices. Among them, capacity building and technical support has been identified by countries as the priority.

ESCAP's partnership with Japan's Keio University on development of the 5D-World Map System is a good example of harnessing the potential of machine learning and artificial intelligence for disaster resilience. ESCAP Member countries from North-East and South-East Asia have been able to minimize losses of life using second-generation earth observation satellites, advanced modelling systems, artificial intelligence and big-data analytics.

The ESCAP/WMO Typhoon Committee adopted its action strategy for 2017–2021, focusing on applications of emerging technologies, multi-hazard approaches, impact-based forecasting, and risk-informed early warning systems.

The backbone for industry 4.0 is communications links, which can support disaster risk prevention, risk reduction and preparedness, as well emergency communication for disaster response and recovery. So it is vital after disasters to quickly restore ICT infrastructure and services. ESCAP's Asia-Pacific Information Superhighway initiative promotes regional cooperation on improving the access to affordable and resilient broadband connectivity by promoting regional cooperation under four pillars of: development of cross-border infrastructure connectivity; efficient internet traffic and network management; strengthened e-resilience from natural disasters; and access to affordable broadband connectivity for all citizens.
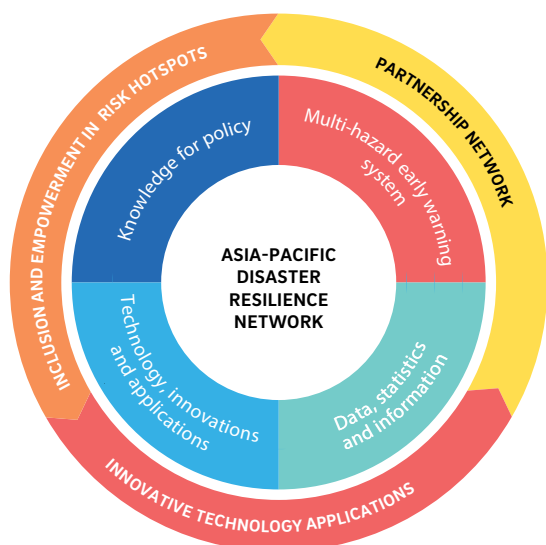
3 Unlock the potential of regional cooperation

Asia and the Pacific has some of the world's most extensive transboundary disaster hotspots. With climate change these are likely to expand still further, creating deep uncertainties. Addressing these will require strategies at the regional and subregional levels.

In 2017, to unlock the potential of regional cooperation, the ESCAP inter-governmental committee on disaster risk reduction established the Asia-Pacific Disaster Resilience Network (APDRN). APDRN, with an emphasis on partnerships and innovation, comprises four inter-related streams: (i) multi-hazard early warning system platform; (ii) data, statistics and information management, which also includes big data from emerging technological platforms and sources; and (iii) knowledge for policy (Figure 5-2).

FIGURE 5-1 **An integrated system for resilience, inclusion and empowerment**

UNDERSTANDING RISK COMPLEXITIES

TARGETING THOSE LEFT BEHIND
IN MULTI-HAZARD RISK HOTSPOTS

IMPLEMENTING RISK-INFORMED
POLICY ACTIONS

FIGURE 5-2 **Structure of Asia-Pacific Disaster Resilience Network**

Regional multi-hazard early warning systems

The advances in industry 4.0 technologies enable more-effective, risk-informed and end-to-end multihazard early warning systems. The benefits can be scaled up through regional cooperation. The longer forecasting and warning lead times enabled through smart technologies go beyond saving lives to ensuring livelihood support. For small farmers in Bangladesh, for example, a flood-warning lead time of one day results in reductions in losses of up to 33 per cent for fish aquaculture. A lead time of seven days reduces household damage by up to 90 per cent. For the moderate 2007 floods of Bangladesh, a forecasting and early warning system could have reduced damages by an estimated $208 million. Estimated benefits over a decade of typical flooding would be about $1,700 million—more than 500 times the cost of a hypothetical forecasting and warning system.[216]

Tropical Cyclones — ESCAP and WMO are partners in the Typhoon Committee and the Panel on Tropical Cyclones which cover the Pacific and the Indian Ocean respectively. In 2018, the Panel on Tropical Cyclones in its 45th session recognized the intensification of tropical cyclones and laid out plans to address their complex risk patterns in South and South-West Asia. With inclusion of new Members, including the Islamic Republic of Iran, the Panel membership increased from 9 to 13.

Tsunamis — The ESCAP and UNESCO-IOC partnership supports effective end-to-end tsunami early warning systems in the Indian Ocean basins. With the lessons learned from the 2018 tsunamis in Sulawesi and the Sunda Strait in Indonesia, the ESCAP Multi-donor Trust on Tsunami, Disaster and Climate Preparedness has prioritized its funding support to multi-hazard risk assessment and early warning. The aim is to enhance the preparedness for near-field tsunamis and help IOC-UNESCO strengthen tsunami early warning in the North-West Indian Ocean.

Flooding — Forecasting transboundary floods and slow-onset disasters remains difficult. Efforts to strengthen regional cooperation for early warning for river basin floods are underway.

For the Pacific Island countries, early warning systems have had support from the Government of Japan and other key partners such as the Indonesian Agency for Meteorology, Climatology and Geophysics. This has helped these countries in the use of statistical and geospatial data for early warning systems via technical training, regional workshops and pilot projects.

Data, statistics and information

In support of strengthening big data ecosystems, APDRN has three initiatives.

The Asia-Pacific Disaster Risk Atlas — The atlas is the online data and information platform of ESCAP's regional institute, the Asian and Pacific Centre for the Development of Disaster Information Management (APDIM).[217] It serves as a decision support tool for risk-informed infrastructure investment and development policy decisions. With a set of geospatial vector and raster data, it covers natural hazards, exposure of critical infrastructure in the built environment, natural resources assets and the vulnerability of city populations. The atlas synthesizes data on cross-border risks and disasters including earthquakes, floods, droughts, tsunamis, cyclones and storm surges, showing where critical infrastructure is severely exposed. The atlas also uses the IPCC reports and synthesizes the state of the science to inform policy decisions on climate-resilient infrastructure.

The Disaster-related Statistics Framework — The Disaster-related Statistics Framework (DRSF) covers the core concepts and indicators defined

in the Sendai Framework and the SDGs, aiming to translate these into specific instructions and technical recommendations for the production and dissemination of statistics.[218] For risk assessment and post-disaster impact assessments, the DRSF also analyses data on population, society, and economy from censuses and surveys. The DRSF capitalizes on UN Global Geospatial Information Management (UN-GGIM), particularly its Geospatial Information and Services for Disasters which promotes open data, communities and sources, as well as spatial data infrastructure. Since November 2018, ESCAP has been the secretariat of the Regional Committee of Global Geospatial Information Management for Asia and the Pacific (UN-GGIM-AP). ESCAP promotes new data acquisition and integration approaches, including Earth observations and geospatial information.

Data-and information-driven regional cooperation— Earth observation satellite and surface-based observations are used to capture transboundary impacts and origins of disasters. Sand and dust storms, for example, are frequently transboundary in nature; storm sources in China can be a thousand kilometres from the impacted regions. Risk-informed policy interventions therefore require dialogue and cooperation among the related countries.[219] The ecological restoration programme has reduced sand and dust storms by between 5 and 15 per cent in the North China Plain.[220] APDIM is currently establishing a regional slow onset hazards network and sand and dust storms alert system. ESCAP has also joined a United Nations Coalition on Combating Sand and Dust Storms to deepen regional cooperation in South and South-West Asia, Central Asia and North and North-East Asia.

Similarly, the Regional Drought Mechanism is a cooperative initiative where various countries or institutions support drought-prone developing countries and expand their capacity to use these and other tools to manage drought while building the capacity of Governments to more effectively utilize space applications. The Regional Drought Mechanism is supported by the Governments of Australia, China, India, the Russian Federation and Thailand.

As a part of the Regional Drought Mechanism, Australia has developed a comprehensive water accounting system pilot for Cambodia, along with DataCube which enables space- and ground-derived information to be better stored, combined and examined.

Knowledge for policy

ESCAP has put in place a knowledge and innovation platform and develops its analytical research products to promote risk-informed policies. This *Asia-Pacific Disaster Report*, for example, has been produced on a biennial basis and the report findings are discussed at the respective sessions of the Committee on Disaster Risk Reduction. The report also contributes to the High-Level Political Forum for Sustainable Development and its regional preparatory process, the Asia-Pacific Forum on Sustainable Development.

ESCAP has been working with the ASEAN Secretariat under its Joint Strategic Plan of Action on Disaster Management to enhance the capacity of national hydrometeorological services and risk-sensitive sectors in South-East Asia.[221] Partnership between ESCAP and ASEAN is mobilizing Member States towards the development of an ASEAN strategy on drought resilience.

As shown in chapter 3, interventions to build resilience cut across a range of issues including health, education, social protection, insurance, infrastructure, urban planning, housing, land tenure, agriculture and livelihoods, which no single ministry can address. Individually, each offers an entry point for breaking the link between disasters and poverty. However, the overall approach will be most effective when Governments consider the potential interactions between each intervention. Coherent strategies and plans, budget and financing, monitoring and reporting systems and inter-sectoral coordination will be a critical norm towards ensuring that all parts of a government pull in the same direction to build the resilience of those left behind.[222]

To provide the knowledge base for improving coherence across ministries, the ESCAP Secretariat and partner United Nations agencies are supporting countries with special needs through the Regional Learning Platform on Policy Coherence for Disaster Risk Reduction and Resilience. Organized for the first time in 2016, the Platform has now been institutionalized as an annual capacity building activity on policy coherence, an important guiding principle of Sendai Framework for Disaster Risk Reduction and its Asia Regional Plan. Attended mainly countries with special needs, participants of the 2018 Platform focused on policies and shared experiences around innovations and evidence-based approaches to policy coherence using the

"Policy Coherence for Disaster Risk Reduction and Resilience: From Evidence to Implementation" toolkit as the main input.[223]

To provide an analysis of the potential risks and impacts of an impending 2018/2019 El Niño event, ESCAP in partnership with the Regional Integrated Multi-hazard Early Warning System released an advisory for the Regional El Niño Group, made up of the United Nations, and major development and humanitarian agencies in Asia and the Pacific.

An analytical report, Ocean Accounting for Disaster Resilience in Pacific SIDS, contributed substantially to the Ocean Accounts Partnership for Asia and the Pacific. The report presented an ecosystem accounting framework to strengthen the linkages of SDG 14 with other SDG targets.

Resilience across the riskscape

The Asia-Pacific region has had considerable experience with reducing disaster risk. But with climate change and expanding disaster hotspots, the region is entering an increasingly uncertain future. All countries will need to consider how every aspect of development can face up to disaster risk. All ministries and departments should consider how they can work together in a more integrated way, so that they are able to identify the people in danger of being left behind, and empower them to protect themselves and build sustainable and resilient livelihoods.

Endnotes

210   ESCAP (2018b).
211   ESCAP (2019b).
212   DESA.
213   ESCAP (2019a).
214   ESCAP/ADB/UNDP Asia-Pacific SDG Partnership.
215   United Nations Climate Action Summit (2019).
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