



Building Resilience to Natural Disasters and Major Economic Crises



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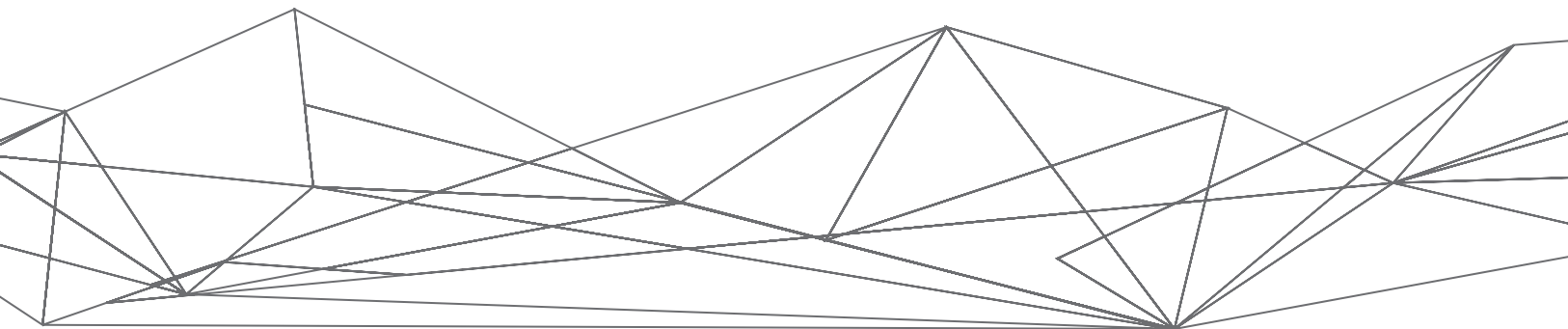
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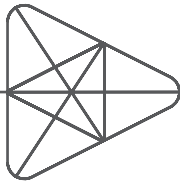
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FOREWORD



Building resilience to multiple shocks is one of the most pressing contemporary development challenges faced by Asia and the Pacific. Economic crises and natural disasters are on the rise and know no boundaries; they straddle wide geographic areas, spread across all sectors of economic activity, and endanger our communities. For communities still living in fragile and conflict-affected States, each shock erodes their capacity to cope with the next disaster or crisis on the horizon. They are twice as likely to be undernourished and their children three times as likely to be out of school, while they receive less than half the amount that Governments in other countries spend on education, health and security. These communities are stuck in life-long vulnerability traps from which it is very difficult to break out.

Five years ago, global economies plunged into deep crises as they struggled under the weight of the most severe economic slowdown since the 1930s. In Asia and the Pacific, the financial crisis converged with the food and fuel crises, which compounded the damage inflicted on the livelihoods of millions of people across the region. Furthermore, in the past few years devastating earthquakes, floods, typhoons, droughts and other natural disasters have wreaked havoc throughout the region, causing enormous loss of lives, and widespread damage to livelihoods, property and local economies. In its wake, climate change has the potential to result in even more disasters among our most vulnerable communities.

Increased connectivity and interdependence through trade and financial flows, dense transport networks and speed of communications, while creating unprecedented opportunities, have also amplified the effects of these multiple shocks. Floods in Thailand, for example, triggered supply chain disruptions across the region, and severe droughts that covered large swathes of China and Central Asia led to higher food prices for millions of people. Meanwhile, turmoil in major financial markets continued to adversely affect people living in far-flung villages in our region who have never even visited a bank.

Although most economies in the region have been fortunate enough to recover relatively quickly from recent economic crises and stabilize towards long-term growth rates, this seemingly visible evidence of economic resilience masks the underlying vulnerabilities of poor and disadvantaged communities. For poor families who struggle daily under the reality of permanently higher food and fuel prices, who are unable to replace the loss of income from jobs that have disappeared and who have inadequate access to systems of social protection, the crises and disasters of years past are not distant memories. The lasting legacy of multiple shocks - food insecurity and rising maternal and child malnutrition, reduced public expenditures on health and education, compromised livelihood opportunities and underemployment - all affect the quality of human development long after GDP growth rates and per capita income have regained their footing. The gap between visible resilience and hidden forms of vulnerability among the "bottom billion" remains very large.

The lessons of the past five years have led to this new normal. The global financial crisis, food and fuel crises, and the consequences of natural disasters may seem to be unrelated, but they are the result of shocks applied to complex systems that interlink social, economic and environmental factors. They highlight the increasing interrelation of economies that have been brought together by globalization, which binds systems and economic activities in locations that were previously unconnected.

Experiences from the region and around the world have proven that disaster prevention and preparedness is far more effective and less costly than recovery and relief efforts. Despite this fact, policymakers are largely in uncharted territory when it comes to integrating crisis mitigation and disaster risk reduction measures into macroeconomic policy planning. As policymakers turn to building resilience as a key pillar of sustainable development for the Asia-Pacific century, they must factor in the impacts of natural disasters, balance short-term macroeconomic stability with long-term development and build capacity across all sectors and levels of government, if they are to successfully manage simultaneous shocks of unknown origin and

magnitude. These are not easy tasks. They call for systems thinking, applying new and more sophisticated decision-making tools and above all, overcoming inherent limitations in addressing risks and uncertainties.

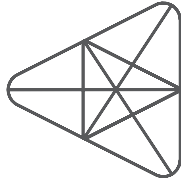
It is my hope that this report will provide a significant contribution to the regional policy dialogue that addresses the pressing question of how people, organizations, institutions and policymakers can work together to weave resilience into the everyday fabric of our social and economic lives. A range of complex factors have impacts on levels of resilience and risks sown by economic crises and natural disasters, including health and education levels, political conflict and the legacy of violence in conflict-affected States. The focus on resilience is crucial in the current environment because multiple shocks are increasingly becoming the new normal for the region. The threats of tomorrow will come at anytime, from anywhere, without warning, and with increasing frequency. Countries that build systems of resilience to withstand, adapt to, and recover from major economic crises and natural disasters are investing in the security of our region's most valuable resource – its people.

A handwritten signature in black ink, appearing to read 'N. Heyzer', with a horizontal line at the end.

Noeleen Heyzer

Under-Secretary-General of the United Nations and
Executive Secretary, United Nations Economic and
Social Commission for Asia and the Pacific

APRIL 2013



ACKNOWLEDGEMENTS

Under the overall direction of Noeleen Heyzer, Executive Secretary of ESCAP, this report was prepared by a team led by Shamika Sirimanne, Director of the Information and Communications Technology and Disaster Risk Reduction Division. The core team consisted of Masato Abe, Patrik Andersson, Witada Anukoonwattaka, Derek Atkinson, Tiziana Bonapace, Clovis Freire, Shaina Hasan, Kelly Hayden, Rémi Lang, Dominic Leong, Manuel Mejido, Linda Vega Orozco, Teemu Puutio, Nokeo Ratanavong, Madan B. Regmi, Mari Sawai, Ermina Sokou and Sanjay Kumar Srivastava.

The team appreciates the valuable support provided by the Senior Management Team of ESCAP, with special thanks to Shun-ichi Murata, Deputy Executive Secretary of ESCAP, Anisuzzaman Chowdhury, Director of the Macroeconomic Policy and Development Division, Dong-Woo Ha, Director of the Transport Division, Nanda Krairiksh, Director of the Social Development Division and Ravi Ratnayake, Director of the Trade and Investment Division who made substantive contributions to the report.

The following ESCAP staff members provided inputs, comments and suggestions: Shuvojit Banerjee, Alf Blikberg, Ksenia Glebova, Eric Hermouet, Alberto Isgut, Beverly Jones, Nagesh Kumar, Daniel Jeongdae Lee, Timothy Wai Leong Loh, Hongpeng Liu, Laura Lopez, Mia Mikic, Oliver Paddison, Hitomi Rankine, Isabel Pereira Rodrigues, Marco Roncarati, Maria Semenova, Harumi Shibata, Robert Spaul, Donovan Storey, Yusuke Tateno, Ram Tiwarae, Keran Wang, Natalja Wehmer and Jenny Yamamoto. The following individuals also provided inputs: Linghe Ye, Nitin Kumar Tripathi, Associate Dean of the Asian Institute of Technology (AIT), and Lal Samarakoon, Director, Geoinformatics Center, AIT.

The following experts prepared technical background papers for the Study: Benigno Balgos, Center for Disaster Preparedness, Philippines, and M.G. Quibria, Professor, Department of Economics, Morgan State University.

The following individuals provided research support: Han Du, Wei Jei, Iris Lim, Francisco Morino, Chitrini Mozumder, Jonghyo Nam, Suhyon Oh, Yuzuru Sato, Shweta Sinha, Zulfiya Suleimenova, Guibo Sun, Kento Yoshimura, Xun Zhang and Rulin Zhu.

The report benefitted from the comments and suggestions of an external peer review meeting held in Bangkok on 26 and 27 February 2013. Participants in the meeting were a group of policymakers and scholars: Debapriya Bhattacharya, Distinguished Fellow, Centre for Policy Dialogue, Bangladesh; Wisit Chairisawatsuk, Assistant Professor, School of Development Economics, National Institute Development Administration, Thailand; Karin Fernando, Senior Professional, Centre for Poverty Analysis, Sri Lanka; Santosh Kumar, Professor and Head, Policy, Planning and Cross-Cutting Issues Division, National Institute of Disaster Management, India; Louis Lebel, Director, Unit for Social and Environmental Research, Chiang Mai University, Thailand; Antonio Limuaco Fernandez, Expert, Earthquakes and Megacities Initiatives, Philippines; Tetsuo Miyairi, General Manager, SOMA Construction Office, Tohoku Branch, East Nippon Expressway Company Limited, Japan; Thusitha Pilapitiya, Policy Advisor, Democratic Governance, Asia-Pacific Region, United Nations Development Programme, Thailand; and German Velasquez, Senior Regional Coordinator, United Nations Office for Disaster Risk Reduction, Thailand. The report also benefitted from review and comments by Surya Raj Acharya, Senior Research

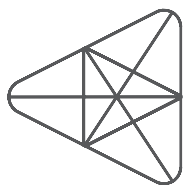
Fellow, Institute for Transport Policy Studies, Tokyo, and Shinya Hanaoka, Associate Professor, Tokyo Institute of Technology.

Asia-Pacific Research and Training Network on Trade (ARTNeT) advisors, John Gilbert, Sisira Jayasuriya, and Debaphrya Bhattacharya provided comments and suggestions on various chapters of the report.

Logistical support in processing and administration was provided by Suraphong Chuachamsai and Narada Kalra. Support from Patricia Budiyanto, Tarnkamon Chantarawat, Preyawan Chobpanich, Sukanitt Jaruveshsuti, Pradtana Limkrailassiri, Kanjana Sibunnanon on proofreading is much appreciated.

Substantive editing of the manuscript was undertaken by Peter Stalker. The graphic concept, design and layout was created by Marie-Ange Sylvain-Holmgren, assisted by Paula Simone do Amaral Praxedes, and printing services were provided by PK Printers.

Francyne Harrigan, Chief Strategic Communications and Advocacy Services, coordinated media communications.



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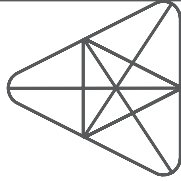
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EXECUTIVE SUMMARY

AN ERA OF OVERLAPPING SHOCKS

A COMPREHENSIVE RESPONSE TO NATURAL DISASTERS AND ECONOMIC CRISES IN ASIA AND THE PACIFIC

The Asia-Pacific region has been battered in recent years by a relentless series of shocks. Some have been related to natural disasters, such as earthquakes or droughts or floods. Others, such as the 2008 financial crisis, have been caused by convulsions in global markets. Still others, such as rocketing food and energy prices, have been the result of a complex combination of shocks.

The traditional approach has been to consider such events individually. This is increasingly unrealistic. Governments across the region often find themselves dealing with overlapping shocks that demand a more comprehensive and systemic approach to building resilience. Resilience in this sense means the capacity of countries to withstand, adapt to, and recover from natural disasters and major economic crises – so that their people can continue to lead the kind of life they value.

For many policymakers this is new territory: they are more accustomed to focusing on problems in particular economic or social sectors rather than treating them as systemic wholes. Even more difficult, they have to take decisive action now about events that may or may not take place. By definition, this is a step into the unknown. On the whole, human beings are not very good at assessing the likelihood of what might happen in the future. Moreover, politicians know that they will be blamed for any such decisions that work out badly while receiving little credit for low-key actions that quietly avert disaster.

The risks they find easiest to identify are those from events that occur fairly regularly. Bangladesh, for example, is accustomed to coping with floods and cyclones and has invested in disaster risk reduction – in flood monitoring, for example, and forecasting and early warning systems. Other natural hazards, such as earthquakes and tsunamis, are far less predictable. Economic shocks may also come as a bolt out of the blue: the collapse of a United States investment bank that helped trigger the 2008 global financial crisis had been considered highly improbable.

To add to the uncertainty, a single event that, in isolation, might seem manageable within national borders can nevertheless provoke multiple and interrelated global shocks. The 2010 floods in Pakistan and the droughts in the Russian Federation were together translated by global financial and trade systems into higher food prices. And massive floods in Thailand in 2011 triggered a cascade of failures – bringing production to a halt in factories around the world.

These possibilities are of increasing concern in Asia and the Pacific because of the rising number of natural disasters. This is the world's most disaster-prone region: in the past decade, about 2.5 million people in Asia and the Pacific have been affected by disasters and almost 800,000 have been killed. At the same time, the economic damage caused by disasters has grown.

The countries that are most at risk to both natural disasters and economic crises are the small island developing States including Solomon Islands, Tonga and Vanuatu. Bangladesh, Cambodia, Fiji, Papua New Guinea and the Philippines, for example, also face high risks of natural disasters, while landlocked developing countries, such as Kyrgyzstan, the Lao People's Democratic Republic, and Tajikistan, are highly susceptible to economic crises. But not all are equally vulnerable. For example, a hazard only triggers a disaster when it encounters exposed and vulnerable communities. Thus, Bangladesh, Japan, Indonesia and the Philippines, even though highly exposed to disasters, have taken positive steps to mitigate the adverse effects.

For people living in fragile and conflict-affected States, the journey from fragility to resilience is often both long and arduous. With the additional threats to lives and livelihoods posed by climate change, natural disasters and economic crises, establishing human security is the most fundamental requirement of development. While this issue is not taken up in this report, what matters most for fragile States is good governance, strong institutions, accountable management of natural, human and financial resources and, above all, enlightened leadership.

THE MACROECONOMICS OF RESILIENCE

Despite the frequency of simultaneous shocks, economic literature offers little guidance on how to respond. Should countries faced with multiple crises maintain conventional macroeconomic stabilization objectives and targets – on inflation or fiscal deficits, or on liquidity norms or debt sustainability? And faced with the prospect of slower growth should they uphold their central bank's objective of low inflation?

From the macroeconomic perspective, a natural disaster generally reduces output and employment. Disasters can also affect trade balances, fiscal balances and public debt. But these outcomes are not automatic; much will depend on government policies, and private sector expectations and responses. Also critical is the nature of the shock. While a natural disaster can deliver a supply shock that increases inflation, an economic crisis can deliver a

demand shock that is likely to be deflationary. Natural disasters and economic crises that occur together can thus mitigate each other's impact on the price level. So getting policies right will mean considering both impacts.

Pre-disaster risk management

When preparing for disaster, Governments need to identify risks and social vulnerabilities and take steps to mitigate them – strengthening building codes, for example, or retrofitting existing buildings, while ensuring that they have systems of social protection that they can scale up to meet emergency needs. But it is also important to make financial preparations, by accumulating savings and foreign reserves, for example, or by transferring some risks through commercial insurance.

All these measures require up-front investments. Some governments may not consider this worthwhile. Moreover, there are risks of moral hazard: low-income countries, for example, may be tempted to underinvest in prevention if they believe they will always be rescued by foreign aid. Today's policymakers may therefore prefer to defer expenditure until a disaster happens, preferably on someone else's watch.

Even the most conscientious policymaker, however, will struggle to make a rigorous cost-benefit analysis if there are too many unknown factors. For assistance, they might turn to emerging sophisticated decision-making tools and methodologies based on scenario analysis, which can help them analyse unpredictable events for which there is very little information. Arriving at the best solution will always be difficult, but ultimately these are issues of public choice, so determining public priorities in disaster risk reduction will benefit from extensive stakeholder participation.

Post-disaster response: financing versus adjustment

Faced with the cost of a natural disaster, governments can draw on reserves or seek new finance – or embark on a programme of macroeconomic adjustment. Indeed, a well-accepted tenet in macromanagement of disasters is: "Finance if you can, adjust if you must".

Where can the finance come from? Some countries will be able to draw on reserves, or they may be able to pay the costs out of current budgets. They can also establish with lenders "contingent" credit lines that would enable them to borrow in the event of a disaster. The poorer developing countries should be able to rely on concessional aid or grants from international donors. In addition, they might assume that workers' remittances to families would increase in times of distress.

Governments and private individuals and corporations can also take out insurance. Governments can also become involved in insurance themselves, either providing it directly or working with the private sector. For some small island economies in the Pacific, disasters

could be on such a scale as to overwhelm the economy – yet, insurance would be prohibitively expensive. In this case, it might be possible to pool the risk with other countries that find themselves in similar positions.

In principle, the Government could also increase commercial borrowing. But this may be difficult. Even countries that have access to international capital markets will find foreign borrowing expensive, especially after a disaster. If so, they may have to adjust through fiscal policy – by redirecting funding from planned projects, by cutting discretionary expenditure or by raising taxes on high-income earners. The choices will depend on the current state of the economy: if it is overheated with a risk of inflation, the Government might impose a temporary tax on high-income citizens in the form of a reconstruction levy.

Monetary policy after a natural disaster presents a classic dilemma: how to use the same policy to reconcile two competing objectives – maintaining price stability while restoring pre-disaster levels of output and employment. Some policymakers would give priority to price stability and therefore tighten the money supply, but this could worsen unemployment and poverty. In fact, many economies are operating far below optimum levels of output, so fears of inflation may be unfounded.

Generally speaking, the midst of a crisis or disaster is not the best time to mechanically pursue prudential norms of macroeconomic stabilization. Instead, the overarching aim should be to arrest the spread of the shock to the real economy, to labour markets and, above all, to the poorest and most vulnerable. Moreover, even in “good times”, there is no unique threshold of stability for each macroeconomic variable – growth, inflation, the fiscal deficit, the current account deficit, or the level of public debt. Rather, there is a continuum of thresholds for various combinations of these key variables. Developing countries should thus not have an overly mechanical interpretation of macroeconomic prudence. While maintaining short-run stability, they should instead be guided by the goals of long-run economic development and poverty reduction. This will require striking a balance between development and stability.

BUILDING RESILIENT COMMUNITIES

Those most exposed to economic crises and disasters are the poor. Without savings and living in precarious circumstances, they have few buffers against shocks. Already disadvantaged by social and economic imbalances, they can thus be further marginalized into vicious cycles of chronic hardship, sometimes for generations.

The poor tend to be more exposed to natural disasters because they tend to live on hazardous land – on earthquake fault lines, floodplains, or coastal areas that are highly exposed to cyclones and typhoons. The poor are also likely to be hardest hit by an economic crisis: most will be low-skilled, casual, seasonal or contract labourers with precarious or irregular work

and low earnings. And among the poor, the most vulnerable to disasters are “excluded” individuals – those who are outside many societal bonds and relationships. Among these are older persons, ethnic minorities and those with disabilities or living with HIV and AIDS. They have less access to networks and fewer relationships of support that they can turn to. They can also be disadvantaged when it comes to emergency relief.

Nevertheless, people facing disasters are rarely passive victims. Most will try to cope by drawing on all their economic, social and natural resources. Unfortunately, under pressure, they can also be forced into “erosive” strategies that lead to a vicious cycle of poverty. They might sell their livestock or agricultural or fishing equipment. Or they may take out high-interest loans. They can also reduce the quantity or quality of food, forego medical treatment, or overexploit natural resources. As a last resort, they may withdraw children from school. All these measures can perpetuate poverty and reduce the welfare of future generations.

The more resilient groups or households, on the other hand, can respond with “non-erosive” strategies that do not endanger their future livelihoods. They might be able to draw on their savings, sell non-essential possessions, or consume less expensive food. They could also seek additional work, either locally or by migrating to a nearby city. In addition, they might draw on family or social solidarity networks for food supplies or informal loans, or engage in reciprocal labour exchange.

Governments can support these forms of community resilience in a number of ways. They can, for example, strengthen systems of social protection – including old age and disability pensions, unemployment pay, maternity and child benefits, and universal access to essential health care. It is crucial to provide a basic social protection floor based on the understanding that all citizens have the right to benefits and that the State has a vital role in ensuring access, if not in the actual delivery of programmes. These systems cannot be set up overnight, and crises and disaster interventions should build on existing mechanisms. It is important, therefore, to ensure that the financing systems are sufficiently flexible so that they can be scaled up for episodic shocks. Ideally, the strategy should be one of “adaptive social protection” – integrating social protection with disaster risk reduction and climate change adaptation.

In the absence of formal social protection, most people rely on traditional or informal protection systems within households, groups and social networks. Generally, in many developing countries, social protection is likely to involve a combination of informal and formal channels – taking advantage of informal connections and systems but supporting these with formal mechanisms where appropriate.

Governments can also help communities with various forms of risk transfer. While richer individuals can take out their own insurance, poorer households cannot afford such coverage. An alternative is “microinsurance” which pools the risks and resources of whole groups. Some of the most effective microinsurance schemes are index based – for example,

assessing the exposure of a group of farmers within a specific area to extreme weather events and compensating them for the associated loss of income without their having to make individual claims.

Some of the most effective public support, especially for more frequent disasters, is likely to come from local governments. They can support community responses, engage vulnerable groups in decision-making and help them become more resilient. To do so, they need to involve those groups in every step of the development process – from vision setting, planning, and implementation to monitoring and evaluation. An important contribution to greater local resilience is effective decentralization which can improve the delivery of key public services. However, decentralization can only be effective if local governments have the necessary capacity, resources, accountability and transparency. In the absence of these conditions, decentralization can lead to rent seeking and capture by local elites.

Responding rapidly to a disaster requires timely and reliable data. The starting point should be extensive pre-disaster vulnerability assessments. Until recently, governments and development partners would have been daunted by this prospect, feeling that they lacked the necessary resources or skills. Nowadays, however, they can take advantage of new technologies. A number of governments, including Indonesia and the Philippines, have, for example, been using satellite-based data and geographic information systems to produce multi-hazard maps showing where the poor are at greatest risk.

During the crisis, both governments and community leaders will need to produce accurate up-to-date information and disseminate it quickly. Fortunately, they can now do this effectively in a variety of ways – print, radio, television, the Internet and mobile phones. Social media platforms are also proving invaluable.

THE LAND, WATER, ENERGY NEXUS – AVOIDING CATASTROPHIC FAILURE

Rapidly rising production and consumption of goods and services could push countries of Asia and the Pacific towards a catastrophic ecosystem collapse. Though natural systems have large absorption capacities, once tipping points are reached, they could suddenly crash, with devastating consequences for other economic and social systems. Building resilience will mean addressing this nexus of converging threats.

Land for agricultural production is becoming ever scarcer. Of the world's remaining arable land that could be used for cultivation, most is in Latin America and sub-Saharan Africa. There is also some in East and South-East Asia, but virtually none to spare in South and West Asia. Moreover, in South Asia, about 45 per cent of land with crop production potential is currently used for human settlements; and urban areas could encroach on the remainder. In addition, much of the land currently under cultivation in the region is becoming degraded: Asia has the largest amount of land affected by desertification, and when land is no longer productive, those cultivating it are often pushed into ecologically fragile areas, such as forests and wetlands.

Freshwater systems are also coming under increasing pressure as a result of over-exploitation and pollution. Most of this is due to cultivation. Unless water is used more efficiently, the world will need, by 2050, 40 per cent more than will be available. In Asia and the Pacific, only about 9 per cent of water withdrawal is for domestic consumption. Even so, about 380 million people in the region do not have access to clean water. About 12 per cent of water is used for industrial production and a number of enterprises are becoming concerned about supplies. Water is also needed for the production of energy – as well as for transport and processing of primary fuels: in 2010, about 15 per cent of the world's total water withdrawals were for energy purposes.

All these processes will be exacerbated by climate change, which is already reducing crop yields in some places and adding to water stress. However, the impact will vary according to location, with some areas suffering more droughts and others experiencing more floods.

Rising consumption is also leading to greater use of energy, whether for industrial processes, transport, or households for cooking and heating. Some energy sources, such as coal, are still relatively abundant, and other fossil fuel reserves, shale oil and gas, seem to be increasing. But these new reserves are more difficult to exploit – demanding significant amounts of energy for extraction. Using more fossil fuels will also increase CO₂ emissions, with serious implications for climate change.

Another concern is the future availability of minerals, some of which are becoming uneconomical to extract. These include the "rare earth" elements that are critical for many industries: electronic equipment, vehicle parts and batteries as well as renewable energy technologies.

Governments and societies that recognize the limits to the natural resource base can take some incremental steps to use resources more efficiently, but ultimately they will have to adapt and diversify their systems of production. The best results will come from involving stakeholders and communities who often have extensive knowledge of how to make the best use of scarce resources. It will also be important to place a true value on natural resources, for, if not properly priced and regulated, these are likely to be inefficiently used and rapidly exhausted.

A good starting point for making better use of energy is to remove fuel subsidies. But there are also many options for boosting water and energy efficiency. Good land use planning can reduce the initial and ongoing costs of resource consumption. The way a city is designed and built locks the population into consumption and production patterns for generations. Good urban planning therefore allows for sustainable city growth – considering the needs of its inhabitants yet also allowing more efficient use of resources. Likewise, sustainable land management, particularly for agriculture, will help reduce land degradation and strengthen food security, while also protecting against some natural disasters, such as floods and drought.

All of this will require strong policies that integrate national development priorities in a cross-sectoral manner, recognizing the true value of natural resources. They can only be effective if supported by strong and effective administration, monitoring and enforcement.

PROTECTING CRITICAL SECTORS

All sectors of the economy need to become more resilient to external shocks, but it is especially important to strengthen certain critical sectors for which any failure is likely to cascade across the whole society. Principal among these are the financial sector, and parts of the physical and social infrastructure.

Financial infrastructure

There are four main types of financial shock: banking crises; the bursting of speculative bubbles; currency or exchange rate crises; and sovereign debt defaults. In reality, financial crises often mutate from one type to another or show multiple symptoms. Banking crises typically result from a loss in confidence in one or two banks. In some cases, this can be contained, but, if not, the shock soon cascades to the real economy in the form of a widespread credit crunch. Speculative bubbles, however, are often consequences of herd behaviour and are particularly dangerous if they affect commodities, such as food or fuel, whose prices are of major significance to vulnerable people.

Governments and financial regulators have taken measures to make financial markets more stable and reduce the potential for future crises. They have, for example, increased surveillance by regulatory authorities, and reinstated controls on the riskiest behaviour, notably taming large-scale, speculative capital flows. In doing so, they need to strike a fine balance: on the one hand, they want to make the financial system less volatile and vulnerable; on the other hand, they do not want to excessively limit the capacity of capital markets to allocate funds to finance legitimate risk-taking that encourages innovation and productivity, and boosts economic growth.

As a result of the experience of the 1997 crisis, many countries in the region have aimed to become more resilient by building up large foreign-exchange reserves. However, they have effectively parked much of this in United States Treasury bonds with very low yields. They could use these funds more productively by investing them in the region. One option, recommended by ESCAP, would be to establish a fund to finance cross-border infrastructure projects and other regional public goods.

Another concern is that governments and investors find it difficult to assess risk exposure – hampered by a lack of transparency, poor accounting standards and weak understanding of financial instruments. This underlines the importance of better market surveillance – with accurate data on international financial interconnections, and assessments of the vulnerability of domestic economies. The Asia-Pacific region has already made progress in this

direction. In 2011, ASEAN established the ASEAN+3 Macroeconomic Research Office (AMRO). A truly Asia-Pacific system of resilience would mean expanding AMRO's membership and the scope of its surveillance. Overall, one of the most important principles should be global harmonization of banking and financial market regulations. Unless similar regulations apply everywhere, the more footloose institutions will be tempted to migrate to laxer jurisdictions.

Many Asia-Pacific developing countries, in particular the least developed countries, depend on exports of a small number of commodities while also relying on commodity imports, especially of food and fuel. All countries are thus concerned about the recent volatility of commodity prices. A number of measures have been proposed to dampen price volatility. One way to address this would be by taxing the trade in commodity derivatives to reduce the number and speed of speculative transactions.

Critical infrastructure

Even infrastructure that is well designed, constructed and maintained will not always withstand natural disasters. Governments will therefore need to identify "critical infrastructure" for which they need higher than usual margins of safety. Critical infrastructure includes not just "hard" infrastructure in terms of buildings or networks, but also the "soft" infrastructure that supports this – the institutions, users, regulations and legislation. Taken together, they should constitute a resilient system.

As regards social infrastructure, the greatest damage is typically to housing, schools and hospitals. Planning authorities generally try to ensure that high-rise "engineered" buildings follow stringent building codes – as a result, they often survive earthquakes. Those planning authorities now need to pay greater attention to houses and other non-engineered buildings using an interdisciplinary approach that includes both engineering and social sciences. They also need to ensure that builders and homeowners comply with these codes.

It is particularly important to secure school buildings. Over recent decades, the death toll of schoolchildren from natural disasters has increased significantly. Had their schools been built to be more resilient, the losses could have been substantially reduced. This means not just building safer structures but also preparing for emergencies and instilling a general culture of safety. Many schools can also serve as disaster shelters, but people living in vulnerable areas may need other forms of dedicated shelters integrated with early warning systems.

Storms, cyclones, floods and earthquakes frequently disrupt community power supplies and cause tremendous damage to transport infrastructure, telecommunications, wastewater and water supplies. Moreover, the various forms of infrastructure are becoming increasingly interdependent, so that a fault in one system can significantly affect many others – triggering a cascade of failures. It has been argued that "lifeline" systems, including power, water, wastewater, communication and transportation, need to be restored within four hours to support emergency response operations. Improving overall resilience thus involves recognizing and managing these interdependencies.

All these forms of infrastructure can be made more resilient. Power transmission lines can, in some cases, be moved underground, and coastal sections of roads and railways can be moved to higher ground or given protective walls or embankments. And in mountainous areas, roadside slopes can be made more stable through bioengineering. To keep transport links open for disaster relief operations, planners should incorporate some redundancy – building extra routes in case one is damaged. Similarly for ICT systems, submarine data cables can be complemented with terrestrial cables and communication satellites.

Making infrastructure more resilient requires significant investment. Although governments in most developing countries are aware of the benefits of disaster risk reduction, they may not feel able to justify such measures. If so, they can consider using some emerging methodologies to evaluate potential benefits and integrate disaster risk reduction and adaptation in planning processes. Adapting high design standards for critical infrastructure increases serviceability and lifespan of costly structures.

In some cases, Governments should be able to seek support from international financing institutions, such as the multilateral development banks. Many banks already incorporate disaster risk reduction into project assessment cycles and are often involved in financing rehabilitation and reconstruction after a disaster.

Some shocks themselves present financing opportunities. In normal circumstances, strict budgetary regulations preclude a high level of investment in new infrastructure. But these restrictions can be relaxed during a financial crisis, opening up opportunities for building more resilient facilities through economic stimulus packages. Another potential source of financing could be the private sector – via public-private partnerships (PPPs); engaging the private sector in infrastructure development should not only provide extra resources but also help improve project design.

Developing resilient infrastructure will demand coordination among many sectors and levels of administration. The focus should be not only on physical infrastructure but also on the associated policies, guidelines and by-laws. It is also imperative to engage communities and different stakeholders: the community can identify the necessary infrastructure while engineers can come up with solutions.

STRENGTHENING SUPPLY CHAINS

As well as protecting physical and social infrastructure, countries will also want to make their supply chains more resilient. Many goods are now provided through complex global chains of production and distribution. An increasing proportion of this trade is South-South. China in particular has now emerged as a “global assembly centre”.

A similar trend is evident in agriculture. Modern agricultural supply chains increasingly rely on imports and multi-tiered systems of supply management. Such chains encompass

inputs, production, post-harvest, storage, processing, marketing and distribution, as well as retailing and final consumption.

While these systems can be very efficient, they are also vulnerable to external shocks. If just one node is damaged the whole chain can be broken. Particularly exposed are enterprises that rely on inputs or intermediate goods from a single source – one which might be located on a tectonic fault line or in an area subject to frequent storms and hurricanes. Supply chains are also vulnerable to sudden changes in demand: faced with an economic downturn or recession in a major market, a highly complex supply chain might find it difficult and costly to react.

Most vulnerable are the small and medium-sized enterprises (SMEs). Generally, they work as subcontractors, supplying basic services or labour-intensive parts and components. Few SMEs are prepared for natural disasters. Typically, they lack insurance and do not carry out risk assessments or have business continuity plans. This makes it difficult to recover from disasters and heightens supply chain disruption.

Enterprises that want to build in greater resilience to natural disasters can take a number of measures. They can: (a) invest more in each location to enhance resilience to natural disasters; (b) spatially diversify the locations of both production and supply; (c) hold larger inventories or stocks; and (d) consider acquiring proper insurance. All these options incur extra costs. In addition to facing direct costs, enterprises building greater redundancy into their systems may also have to forego some economies of scale or opportunities for lower factor costs.

Devising the optimal strategy is not easy, particularly when allowing for rare events. Nevertheless, firms will need to assess risks and find ways to control them – and ensure that they have robust business continuity plans. Particularly important in this are the global value chain (GVC) anchors, the transnational corporations around which these chains work; they can help their smaller business partners become more resilient and, if necessary, help with reconstruction.

Governments can also support these efforts – improving the overall regulatory framework, providing better risk information and modelling systems and subsidizing private insurance. They can also foster the development of business continuity plans, for example by imposing legal requirements for such plans or by offering tax incentives or providing technical support. Governments can also temporarily relax labour movement restrictions to enable GVC anchors to send in people to assist in overseas subsidiaries.

MUTUAL SUPPORT THROUGH REGIONAL COOPERATION

Many of today's shocks are transboundary, so they will need transnational responses. By working together, Asia-Pacific governments can produce solutions that are greater than

the sum of individual country responses. The Asia-Pacific region has some regional cooperation mechanisms that deal with natural disasters and economic shocks. However, they are at various stages of development and, in most cases, do not have resilience built in.

What is needed now is a new regional framework for resilience-building – one that rebalances economic, social and environmental systems. The regional framework proposed in this report consists of three pillars, three enablers and an integrator.

Pillars

Coordinated economic management – In fiscal policy, for example, countries can work together to prioritize public investments in regional infrastructure, improving disaster preparedness, and adapting to climate change. Countries can also coordinate monetary and exchange rate policies and harmonize their banking and financial market regulations, while strengthening regional monetary and financial monitoring and surveillance. At the same time, Asia-Pacific economies can rationalize their preferential trading agreements to facilitate regional trade.

Coordinated investment in social protection and inclusive development – Inclusive development will involve greater investment in social infrastructure, particularly in education and health services. Similarly, all countries need to establish social protection floors – not as a handout but as an investment in building resilience. If countries cooperate on these issues, they can build synergies in the planning, coordination and tracking of such systems, which could ultimately lead to the establishment of a regional social protection fund. Such a fund, built on the principles of regional solidarity, could go a long way towards building resilience, especially for least developed countries, which have the largest portions of the population vulnerable to multiple shocks. Apart from the political groundswell that builds up from regional solidarity, there are numerous synergies from enhanced economic and social security, not least of which is the mitigation of push factors in economic migration and the huge expenditures of high-income countries on border protection. ESCAP could provide the platform for a further dialogue on this issue.

Cooperation on food security and sustainable resource management – Governments need to strengthen existing integrated river basin management frameworks by tapping into the new dynamism of South-South cooperation. Comprehensive frameworks can help countries sustainably manage shared water, energy and land resources – all of which are critical for food security.

Enablers

Investing in technological innovation – Governments need to manage the overall impacts of innovation – ensuring that the benefits spread to everyone, especially vulnerable

groups, while also taking measures to minimize potential risks, both for people and the environment. This will require collaboration between the public and private sectors both within and between countries.

Monitoring and early warning – Governments should continue to strengthen regional monetary and financial monitoring and surveillance. Similarly, in disaster-prone areas, they will need to generate and share people-centred risk knowledge, and strengthen regional multi-hazard monitoring and early warning systems. For this, they can work more effectively through regional cooperation – which would enable them to pool scientific knowledge and technical expertise and take advantage of economies of scale.

Pooling resources for better preparedness – For this purpose, ESCAP could serve as a bridge – bringing together regional cooperative mechanisms that have similar expertise and mandates. Cooperative mechanisms, such as RESAP and Sentinel Asia, for example, can provide satellite-based data and products. Supply chains could also be made more resilient through joint regional supply chain risk assessments.

The integrator

Synergizing regional efforts – All these pillars and enablers would need to be integrated into a comprehensive whole. For this purpose, ESCAP, as the main economic and social development centre of the United Nations system for the Asian and Pacific region, can provide the regional platform for mutual cooperation, sharing experience and building the region's resilience to withstand, adapt to, and recover from overlapping shocks.

The Asia-Pacific region has become the driving force in the global economy and has made significant progress in reducing poverty. Nevertheless, the region still faces considerable risks – most countries are regularly exposed to shocks that could jeopardize future economic and social progress. Countries across the region need, therefore, to work together to consolidate and extend their achievements by ensuring that their economic and social systems are sufficiently robust, flexible and resilient to deal with what lies ahead.