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AT THE HEART OF SUSTAINABLE DEVELOPMENT

CHAPTER 5 AT THE HEART OF SUSTAINABLE DEVELOPMENT

"Sustainability starts in Sendai."

Ban Ki-moon, Secretary-General of the United Nations
at the opening of the Third UN World Conference on Disaster Risk Reduction,
Sendai, Japan, 13 March 2015

Disaster risk reduction cannot be confined to one or two government departments. Rather it is a responsibility for every part of government – from education to health to transport to social protection. Just as every sector can be affected by earthquakes or floods or cyclones, so every sector needs to consider how to make its activities disaster resilient.

Disaster risk reduction is an essential component of sustainable development. Measures to reduce the impact of disasters – building stronger infrastructure, for example, or better housing, or better organized communities – also support development in general. But the process works both ways, because countries with higher levels of development are also better able to defend themselves from disasters: as their economies grow, infrastructure becomes more robust and governments that have more resources can provide stronger systems of protection. Sustainable development thus reduces vulnerabilities and makes countries more resilient to disasters.

Disaster risk management should thus be closely integrated with development planning and programming. However in the Asia-Pacific region, there is still a long way to go in achieving this in an inclusive manner in all development sectors, and at all levels.

THE SUSTAINABLE DEVELOPMENT GOALS

The world has increasingly recognized the importance of integrating disaster risk reduction into every development activity, an understanding that has evolved over the years – from the 1987 World Commission on Environment and Development to the 2015 Sendai Framework for Disaster Risk Reduction 2015–2030 (SFDRR) (Box V-1). Disaster risk reduction is also central to the proposed Sustainable Development Goals (SDGs) which address this priority in a number of goals, including those on poverty eradication, food security, infrastructure, cities and human settlements, climate change and ecosystems (Table V-1).¹

The SFDRR is thus integrated with the SDGs—horizontally across development sectors and

BOX V-1

Disaster risk reduction in the global development agenda

Global understanding on the importance of disaster risk reduction for sustainable development has evolved over recent decades.

1987 – World Commission on Environment and Development – This made the first global assessment of disasters, pointing out their devastating effects on development.² The United Nations General Assembly responded by designating the 1990s as the International Decade of Natural Disaster Reduction and adopted an international framework of action that called upon all governments to ‘formulate national disaster-mitigation programmes, as well as economic, land use and insurance policies for disaster prevention and, particularly in developing countries, to integrate them fully into their national development programmes’.³

1994 – The World Conference on Disaster Reduction – Its ‘Yokohama Strategy and Action Plan for a Safer World’ reiterated that ‘disaster prevention and preparedness should be considered integral aspects of development policy and planning’.⁴ A review of the Yokohama Strategy pointed out that ‘ensuring an established disaster reduction strategy that is linked to individual sectoral interests and integrated into national and local development planning and objectives’ remained one of the most critical gaps in the strategy and plan of action.⁵

2005 – Hyogo Framework of Action – The HFA tried to address this gap by recognizing that ‘effective integration of disaster risk reductions into sustainable development policies, planning and programmes at all levels’ would be one of the strategic goals. And addressing the underlying risk factors across all sectors of development would be one of its five priorities of action. However, progress in this regard has been slow. The public investments for disaster risk reduction have been inadequate, as there was very little appreciation of the costs and benefits of risk reduction among the agencies responsible for planning and financing of development. Thus, disaster risk management has been skewed towards disaster response.

2015 – Sendai Framework for Disaster Risk Reduction – The SFDRR identified these critical gaps and substantially broadened the scope and purpose of the global framework of disaster risk reduction. The expected outcome and goals of the framework focused on implementation of ‘integrated and inclusive’ risk reduction with various measures – economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional’. The SFDRR has been carefully aligned with the SDGs: its period of action 2015-2030 is coterminous with that of the SDGs and its progress indicators are being developed by an intergovernmental working group in conjunction with the inter-agency expert group on indicators for sustainable development.

TABLE V-1

Resilience to disasters as a cross-cutting issue in the Sustainable Development Goals

SDGs	Main DRR linkages	Examples
Poverty eradication and economic growth	<ul style="list-style-type: none"> Disasters tend to have the greatest long-term impacts on those people in the poorest income quartile or quintile, although lack of data and research on long-term effects of disasters at household level makes analysis of the complicated linkages between disasters and impoverishment difficult Impoverishment is linked to lack of access to markets, capital, assets, and social security and insurance mechanisms that can help people to cope and to rebuild Disasters affect disproportionately the poor in Asia-Pacific; and LDCs in the region have reported annual damage close to 1% of their GDP since 1970, which is significantly higher than the rest of countries (Chapter 1, "Countries with special needs") Taking on risks and proactively managing them is a natural element of development and economic growth, and risk assessment and DRR planning should be integrated in investment planning at all levels 	<ul style="list-style-type: none"> There are over 500 million poor people, in 17 Asia-Pacific countries, who are living under medium or higher disaster risk (Chapter 1) In rural Andhra Pradesh, India, drought was reported as the single most important factor contributing to impoverishment (Chapter 1)⁶ In the Indian states of Jharkhand, and Odisha (formerly Orissa) and Chattisgarh, drought-related income losses were close to 80 per cent⁷ In the aftermath of the Nepal earthquakes in 2015, poor households in rural areas were more adversely affected than those who lived in cities. The earthquakes are expected to have pushed 2.5 to 3.5 per cent of the population into poverty—around 700,000 people (Chapter 1) After the earthquake in Sichuan, China in 2008, the proportion of the province's population covered under the 'basic provision protection' scheme rose to more than 50 per cent. Five years after the earthquake, this had not returned to the pre-disaster level (Chapter 1) Globally, the expected annual average loss from natural disasters is \$415 billion – of which 40 per cent is likely to come from 50 countries in Asia and the Pacific. In Myanmar, the annual average loss represents 30 per cent of its annual capital investment. In the Philippines it is expected to be 14 per cent and in Cambodia 10 per cent (Chapter 1)
Food security, sustainable agriculture	<ul style="list-style-type: none"> Disasters destroy critical agricultural infrastructure and assets, and they cause losses in the production of crops, livestock and fisheries, causing serious damage to livelihoods and food security of millions of small farmers, pastoralists, fishers and forest-dependent communities in developing countries Increasing demand for farmland can increase the risk of hazards through environmental degradation. For example, landslides can increase when vegetation is cleared for agriculture on steep slopes The agriculture-food-nutrition sector is challenged to move towards resilient sector specific DRR measures, technologies and practices which raise yields and increase resilience against production failure, as well as towards a more sustainable use and management of vital resources 	<ul style="list-style-type: none"> A heat wave in the Russian Federation in 2010 led to the worst drought in nearly 40 years. Added to this were historically severe floods in Pakistan, which led to significant drops in global food supplies⁸ In 2010, following a <i>dzud</i> drought event in Mongolia, more than 8.4 million livestock died, affecting more than 770,000 herders. Among them, 164,000 herders lost more than half their livestock and 43,500 were left without a single animal⁹ Estimates from India suggest that drought reduces agricultural production by 12 per cent, compared with floods, which reduce production by 5 per cent (Chapter 2). In the state of Rajasthan, regular droughts have led to forced migration, unemployment, increased debt and reduced food consumption In South-Western China the Grain for Green Program bans logging and agriculture on steep slopes and prohibits forest clearing. In exchange, the local communities receive grain and cash subsidies as well as protection against flooding events The 2010-2011 floods in Australia led to the loss of \$1.6 billion worth of crops, reducing wheat exports by 1.5 million tons and causing increases in world commodity prices¹⁰ Typhoon Ketsana hit Lao People's Democratic Republic in 2009, inundating 28,500 hectares of rice and crop planted areas. Five of the affected provinces were responsible for around half of domestic rice production¹¹ A severe drought in Afghanistan in 2008 and 2009 led to an acute food supply crisis. Wheat production, at 1.5 million tons, was 60 per cent lower than previous years¹² A severe drought in 2000 and 2001 in Tajikistan and Uzbekistan cut the availability of drinking and irrigation water and led to slow, chronic forms of malnutrition as households eliminated meat and dairy products from their diets

Health and education	<ul style="list-style-type: none"> • The Asia-Pacific region accounted for 60 per cent of all deaths in disaster events globally since 2005. A person living in the Asia-Pacific region is twice as likely to be affected by a natural disaster as in Africa, and 6 times more likely compared to someone living in Latin America and the Caribbean¹³ • Disasters destroy and disrupt service in health and education facilities • Outbreaks of communicable diseases are often linked to the displacement of people in post-disaster situations, and can further hamper disaster relief • Disasters hamper countries' ability to invest in social development • Education can also greatly contribute to preparing communities and building inclusive, disaster resilient societies, as was acknowledged in the HFA 	<ul style="list-style-type: none"> • In the 2015 Nepal earthquakes, more than 460 public and private health facilities were completely destroyed, almost 7,000 schools were completely or significantly damaged (Chapter 1)¹⁴ • In China's 2008 earthquake, almost 5,400 children died or went missing, 4,500 classrooms were completely destroyed¹⁵ • In Pakistan, the 2005 earthquake, 2007 cyclone and 2010 floods all led to drops in net primary school enrolment¹⁶
Water and sanitation	<ul style="list-style-type: none"> • Earthquakes, tsunamis, floods and storms were responsible for around 92 per cent of the total damage in Asia-Pacific since 1970¹⁷ • Lack of basic services and sanitation combined with disasters can also create new risks, for example by turning a heavy rain into disastrous flood with the spread of disease • Disasters, particularly localized, small-scale events, hinder progress in achieving universal access to water and sanitation by damaging sewerage and water supply infrastructure 	<ul style="list-style-type: none"> • As a result of floods in Solomon Islands in 2014, more than 1,000 shallow unprotected wells were contaminated, and flood-induced landslides damaged dams, pipelines and water tanks. This resulted in losses of \$2.2 million (Chapter 1)¹⁸ • Globally, a survey of 65 countries and two states found that more than 90 per cent of all damage and losses of water and sanitation facilities were from disaster events¹⁹ • In 2015 cyclone Pam in Vanuatu damaged a total of 65,000 metres of electric transmission and distribution lines, affecting 12,000 people. Relatively few resources have gone into restoring the energy sector due to urgent needs in other priority areas, such as food, water and shelter²⁰ • The 2012 typhoon Evan caused widespread damage in the Western division of Fiji which experienced damage to power poles, power lines and transformers. The provision of electricity was seriously hindered and it took more than four weeks to restore power²¹
Gender equality and women's empowerment	<ul style="list-style-type: none"> • Due to existing socioeconomic conditions, cultural beliefs and traditional practices, women and men are affected differently by disasters • Productive resources tend to be owned by men, and losses in the informal sector and subsistence farming, dominated by women, are not often recorded at all • Despite being disadvantaged by economic, social and cultural factors, women can serve as agents of change and their role in disaster preparedness and relief both at family and community level is well documented 	<ul style="list-style-type: none"> • Women represented an estimated 61 per cent of fatalities in Myanmar after cyclone Nargis in 2008 and 70 per cent after the 2004 Indian Ocean tsunami in Banda Aceh • The 1991 cyclone Gorky in Bangladesh killed 140,000 people. Within the age group 20-44, the female death rate was 71 per 1,000, compared to 15 per 1,000 for men • Following the 2010 floods in Pakistan, women were either overlooked or were unable to be reached because their mobility was restricted²²
Inequality	<ul style="list-style-type: none"> • Low-income households suffer a disproportionate share of disaster impacts and people living in multidimensional poverty are likely to live in hazard-exposed areas and are less able to invest in risk-reduction measures • Disasters hit hardest the most marginalized, notably children, older persons and persons with disabilities • Extensive risk particularly affects areas already characterized by social inequality and exclusion, where a deficit of infrastructure is an underlying source of vulnerability and loss of this further aggravates the situation 	<ul style="list-style-type: none"> • In villages affected by the 2004 Indian Ocean tsunami the death rate was highest for young children and older persons, and was 40 per cent higher for women than for men • Following the earthquake in Japan in 2011, the death rate in Miyagi region amongst the total population of the coastal area was 0.8 per cent, while it reached 3.5 per cent among persons with disabilities • When tropical storm Washi hit Mindanao in the Philippines in 2011, informal communities were hit the hardest²³

Sustainable cities and resilient infrastructure	<ul style="list-style-type: none"> Up to 742 million people, or 60 per cent of Asia-Pacific city dwellers, are exposed to levels of either 'high' or 'extreme' multi-hazard risk (Chapter 1) More than 60 per cent of the area projected to be urban in 2030 has yet to be built; this poses significant challenges but also opportunities to properly integrate DRR in long-term planning Hazards provide opportunities for major advancements in DRR with focus on building back better; it should not be limited to structural improvements in buildings or to specific elements of infrastructure without adequate focus on underlying drivers Those living in informal settlements are most vulnerable to disasters, and many have migrated to slums due to disasters in their original settlements Extensive risk is characteristic of informal urban settlements and low-income rural areas, where poverty forces low-income households to occupy areas of low land value that may be exposed to floods, landslides and other hazards Jakarta's plan for 2010–2030 calls for incorporating risk reduction activities into long-term spatial planning for the city. This includes: restoration of mangrove forests; improvement in public facilities and mass transit; refinement of building and environmental regulations that consider hazard risk; redesign of technology and engineering in disaster areas; and improvements of provision of open space for anticipated increases in intense rainfall Slum populations and their increase in metropolises such as Dhaka or Manila are significantly augmented by migration related to floods, storms and droughts In 2014, heavy rainfall in Nepal caused severe landslides at Jure village in Sindhupalchowk district, completely obstructing the Arniko highway, part of the Asian Highway network connecting Nepal with China. Importers faced significantly higher costs of transportation from taking alternative routes (Chapter 1) The 2010 - 2011 floods Australia damaged more than 9,100 kilometres of roads 4,700 kilometres of rail networks. Power to 480,000 homes was disrupted and more than 50 coal mines were damaged on disrupted²⁴ The 2011 Typhoon Haima in Lao People's Democratic Republic led to continuous rain, which caused landslides and blocked national, provincial and tertiary roads. (Chapter 1)²⁵ After the 2015 Nepal earthquakes, half a million houses collapsed or were damaged beyond repair; more than 250,000 houses sustained damage. (Chapter 1)²⁶ In 2015, cyclone Pam in Vanuatu destroyed 15,000 homes and affected 60 per cent of the population, setting the country's development by years (Chapter 1)²⁷ In Dhaka, Bangladesh, vegetation cover has been reduced by more than half. This has depleted environmental barriers, increasing the potential impact of cyclones, floods and drought events (Chapter 1)
Climate change	<ul style="list-style-type: none"> Many parts of the world are witnessing an increase in extremes of climate, such as greater extremes of temperature, heavier rainfall, or higher maximum wind speed of storms. This can result in an increase in natural hazards such as flash flooding, drought, landslide, and storm surge In most countries, the predicted annual average loss increases under climate change scenarios. But affects will differ country by country Drought and flood hazards are among the most potent causes for long-term impoverishment, particularly in rural areas In Asia and the Pacific, 80 per cent of disaster events reported since 1970 have been hydrometeorological-related events such as floods, storms and droughts. These have affected 5.8 billion²⁸ Maldives is on average 1.5 metres above sea level. 80 per cent of the land area are less than one metre above sea level. A slight sea level rise will have devastating consequences. Some states, such as the island of Male, risks complete inundation by the end of the century²⁹ Afghanistan, parts of China and India and countries in Central and South Asia, rely heavily on water from mountain glaciers and snow melts. A year with limited snow in winter will affect water resources during the growing season (Chapter 2) Glaciers are retreating at an alarming rate and extreme climate events may become more intense. In particular, heat waves can seriously impact many countries (Chapter 2)
Ecosystems	<ul style="list-style-type: none"> Environmental degradation is one of the main drivers of disaster risk Natural ecosystems can reduce vulnerability to natural hazards and extreme climatic events and complement, or substitute for, more expensive infrastructure investments Communities dependent on fragile or degraded landscapes – such as overgrazed, heavily deforested or severely eroded lands – are often the most vulnerable to losses from natural hazards The effects of land degradation are often irreversible The 2004 Indian Ocean tsunami damaged coral reefs in Indonesia, Thailand and Sri Lanka. Damage was greatest in reefs that had previously suffered destructive fishing practices (Chapter 1)³⁰ In Pakistan, high rates of deforestation have increased susceptibility to floods and landslides during heavy rainfall (Chapter 1)³¹ Mangrove ecosystems reduced the impacts of the Odisha cyclone on coastal communities in India in 1999 (Chapter 1)³² Around 1,400 million hectares of land are affected by desertification across Asia, more than any other region in the world. In China and Pakistan, almost a third of productivity gains were negated by soil and water degradation (Chapter 2) Ecosystems in 32 of 34 Asia-Pacific countries, are experiencing 'medium' to 'strong' degradation (Chapter 1)

	<ul style="list-style-type: none"> Some countries have been strengthening the disaster resilience of ecosystems. Since the 1970s India has taken a watershed development approach to agricultural production. It has, over the years, improved and reforested more than 10 million hectares of degraded land (Chapter 2)
Governance and peaceful societies	<ul style="list-style-type: none"> Governance arrangements adopted by many countries, relying heavily on specialized emergency management organizations, are not always appropriate to address disaster risk Disaster risk governance (DRG) often mirrors the challenges, restrictions, blockages and obstacles that exist within the overall governance arrangements, but DRG can also support good governance Conflict and fragility can increase the impact of disasters, and disasters can exacerbate conflicts
Means of implementation, renewed global partnership	<ul style="list-style-type: none"> International cooperation has heavily concentrated on emergency-relief and reconstruction instead of preventive DRR Funding for DRR is strongly concentrated in just a few recipient countries, with all but one (Bangladesh) of the top 10 recipients of financing being middle-income countries Capacity building will be crucial, and there exists a need for closer coordination between DRR and climate change adaptation; lack of coordination on technology transfer has led to fragmented implementation Globally for every \$100 spent on development aid, just 40 cents has been invested in defending that aid from the impact of disasters In Bangladesh for every \$1 invested in storm, cyclone and flood warning prediction systems, the estimated return is between \$8 and \$500 over a ten-year period. According to research undertaken by the World Bank, investments in hydrometeorological warning services, in developing countries, have a cost-benefit ratio between 4 and 36 (Chapter 4) International assistance focuses primarily on disaster response and recovery while giving less priority to prevention and preparedness. In the Asia-Pacific region, over the past decade total aid from the international community was \$438 billion, however only \$2.85 billion was allocated for disaster prevention and preparedness (Chapter 1)

Source: ESCAP based on UN-DESA, 2015.

vertically through the focus on implementation at all levels: global, regional, national and local. What was hitherto seen as a difficult and complex task by most of the developing countries is now emerging as a concrete agenda for action. There is also the potential for additional financial resources, as stipulated in July 2015 in the Third International Conference of Financing for Development, and also promised for the Green Climate Fund as part of the new climate agreement in December.

Integrating disaster risk reduction into development planning means looking critically at

each programme, activity and project, ensuring that it reduces existing risks and also avoids creating new ones—what is referred to as ‘prospective’ or ‘anticipatory’ risk management.³³

The principles for ensuring that disaster risk reduction is a national as well as a local priority were established in the Hyogo Framework of Action. Its first priorities for action prescribed six strategic principles (Table V-2). These principles provide a ‘horizontally and vertically integrated systems approach with strong coordination across sectors and a delegation of responsibilities at the local level based on the principle of subsidiarity’.³⁴

TABLE V-2

Principles for integrating disaster risk reduction into development

Strategic Principles	Targets
A. Legal and regulatory mechanisms	Adopt, or modify where necessary, legislation to support disaster risk reduction, including regulations and mechanisms that encourage compliance and promote incentives for undertaking risk reduction and mitigation activities.
B. Institutional mechanisms	Support the creation and strengthening of national integrated disaster risk reduction mechanisms, such as multisectoral national platforms, with designated responsibilities at the national through the local levels to facilitate coordination across sectors.
C. Policies and planning	Integrate risk reduction, as appropriate, into development policies and planning at all levels of government, including in poverty reduction strategies and sectors and multisector policies and plans.
D. Finance and budgeting	Allocate resources for the development and the implementation of disaster risk management policies, programmes, laws and regulations on disaster risk reduction in all relevant sectors and authorities at all levels of administrative and budgets on the basis of clearly prioritized actions.
E. Decentralization	Recognize the importance and specificity of local risk patterns and trends; decentralize responsibilities and resources for disaster risk reduction to relevant subnational or local authorities, as appropriate.
F. Capacity building	Assess existing human resource capacities for disaster risk reduction at all levels and develop capacity-building plans and programmes for meeting on-going and future requirements.

LEGAL AND REGULATORY MECHANISMS

Integrating disaster risk reduction in development requires a sound legal and regulatory structure (Box V-2). This refers not just to laws covering disaster management but also legislation for all other relevant sectors. Recently, countries in Asia and the Pacific have introduced specialized legislation on disaster management, generally aligned with global frameworks and addressing disaster risk reduction in a comprehensive manner. They include:

- *Bhutan* – The Disaster Management Act provides that the Government shall ‘accord high priority to mainstreaming of disaster risk reduction into its development plan, policy, programme and project’ and ensure that ‘agencies receive adequate budget’.³⁵
- *India* – The Disaster Management Act provides that disaster management plans shall be prepared at the national, provincial and local levels, which would include ‘measures to be taken for the integration of disaster prevention and mitigation into development plans and projects’.³⁶

BOX V-2

Laws and regulations for disaster risk reduction

Although many countries in Asia and the Pacific prioritize DRR in a range of programmes, policies, plans and strategies this is not necessarily reflected in legislation. In order to cultivate a whole-of-society approach to DRR and provide national leadership and policy direction, governments have often established a single agency, such as a national disaster management agency or a civil defence office, as the national focal point. These offices need to strengthen their coordination with other sectors and stakeholders, especially those related to development planning and climate change adaptation. They also need clear legal mandates and authority for DRR, matched with mandated resources and capacity.

There are, for example still significant gaps in the regulatory frameworks for safety in building and construction, as well as land use and spatial planning. And even countries that have the necessary legislation do not fully implement it. This may be due to a weak 'culture of compliance' and insufficient resources at the local government level. Addressing these failings will mean investing more resources and building the capacity of technical experts at the local level, while promoting public awareness – combined, in some cases with sanctions for non-compliance in major developments.

Governments typically administer DRM laws and environmental laws, including climate change laws, separately from much of the building and spatial planning system. As a result, there is often little coordination between these sectors. One option is to use environmental impact assessments as DRR tools in the construction of new developments.

Source: IFRC and UNDP, 2014.

- *Indonesia* – Article 6 of the Indonesian Law Concerning Disaster Management stipulates that the 'Government's responsibility shall include disaster risk reduction and integration thereof into the development program'.³⁷ Article 35 defines that disaster risk reduction is one of the continuous activities to be undertaken during the pre-disaster phase that would include disaster management planning, prevention, integration into development planning, disaster risk analysis, spatial structure plans for implementation and enforcement, and education and training.
- *Pakistan* – The 2010 Disaster Management Act declares the establishment of the country's multi-tiered system for disaster management, including a National Disaster Management Authority.³⁸
- *The Philippines* – The Philippine Disaster Risk Reduction and Management Act provides that it shall be the policy of the State to 'adopt and implement a coherent, comprehensive, integrated, efficient and responsive disaster risk reduction program incorporated in the development plan at various levels' and further to 'mainstream disaster risk reduction and climate change adaptation in development processes such as policy formulation, socioeconomic development planning, budgeting, and governance, particularly in the areas of environment, agriculture, water, energy, health, education, poverty reduction, land use and urban planning, and public infrastructure and housing, among others'.³⁹
- *Viet Nam* – The Law on Natural Disaster Prevention and Control 2013 makes 'integration

of natural disaster prevention and control into national and local socioeconomic development master plans and sectoral development plans' one of the country's basic principles of disaster prevention and control.⁴⁰

Other countries, including Bangladesh,⁴¹ Sri Lanka⁴² and Samoa⁴³ have also developed overarching frameworks on disaster risk management based on the HFA, and are calibrating these frameworks with the emerging global development agendas.

Some of the region's developed countries, such as Australia, New Zealand and Singapore, do not have stand-alone national laws on disaster risk management, but have firmly embedded the systems and processes of risk reduction across sectors, both within and outside government. This integration has taken place over years of development practice, through a continuous process of iterative learning from successive disaster events.

- *Japan* – The Disaster Countermeasures Basic Act provides that the Central Disaster Prevention Council shall formulate a basic disaster prevention plan, which would include (a) a long-term comprehensive plan for disaster prevention and (b) 'operational' and 'local' disaster prevention plans. These plans are 'reviewed each year in the light of research findings, conditions of disasters that have occurred, and the effect of measures taken', and revised if considered so necessary.⁴⁴ The Basic Act provides guidance for integration of disaster risk reduction in sectoral laws.
- *The Republic of Korea* – There are 23 laws for disaster prevention. In addition, there is a Framework Act on the Management of Disasters and Safety and also the Countermeasures against Natural Disasters Act, which integrates disaster risk reduction across various sectors of development.

Another challenge for developing countries is to produce regulations for the private sector—which may be working with the government through public-private-partnerships, or carrying out infrastructure and real estate projects, such as housing, highways, airports and seaports, telecommunications, power generation, transmission and distribution networks, oil and natural gas, and mining. Thus far, however, the legal regimes have focused mainly on tariff structures and technical standards, and specifications have not always factored in measures for risk reduction.

INSTITUTIONAL MECHANISMS

In Asia and the Pacific the institutional arrangements for disaster risk reduction broadly follow one of three models.

A specialized authority

In the first model, there is a separate specialized national agency or authority, usually chaired by the head of government, which steers overall disaster risk management and provides guidance for similar authorities at provincial and local levels. This is the dominant model in South Asia – as in Bangladesh, Bhutan, India, Pakistan, and Sri Lanka. In India, the National Disaster Management Authority, with the prime minister as chairman and nine nominated full-time members, lays down policies and guidelines and monitors implementation. In Pakistan the same responsibilities are entrusted to the National Commission on Disaster Management with the prime minister as chairman and eight other members: ministers of federal government, chief ministers of provinces, and the leader of the opposition. The Commission is assisted by the National Disaster Management Authority which

has full-time members. Similar arrangements are in place in Sri Lanka and Bangladesh with a National Council on Disaster Management with the president/prime minister as chairman and supported by a Disaster Management Centre/Bureau.

Interministerial coordination

In the second model, disaster management is guided by a high-level interministerial coordination mechanism, but basic responsibilities remain with the respective government departments or agencies. This model is followed by China and by five South-East Asian countries: Cambodia, Lao People's Democratic Republic, Malaysia, Myanmar, and the Philippines. In China the inter-agency coordination body is the National Committee for Disaster Reduction headed by a vice-premier of the State Council which has representation from 33 ministries and departments, including relevant military agencies and social groups.⁴⁵ In Malaysia, coordination is carried out by the National Security Council in the Prime Minister's Department. In Cambodia coordination is the responsibility of the National Committee for Disaster Management, headed by the prime minister. In the Philippines, the corresponding body is the National Disaster Risk Reduction and Management Council which is headed by the secretary of the Department of National Defence.

A single agency

In the third model, disaster management is the exclusive responsibility of a single agency or government department which discharges this in coordination with other agencies. For many years in most countries this was the dominant model but it is giving way to the first or

second models. It is still being used, however, by countries that do not have separate disaster management laws, such as Nepal, Maldives, Timor-Leste and most countries in Central Asia. In Nepal the responsible agency is the Ministry of Home Affairs, in Maldives it is the Ministry of Defence and in Timor-Leste it is the Ministry of Social Solidarity. Some of these countries are drafting disaster management laws that may see a transition to a multisectoral coordinating mechanism.

It is clear however, that even the first and second models are not yet working effectively. Having the head of state or government as the head of the national disaster management authority, or locating the national commission or committee on disaster management in the office of the prime minister or president, is meant to ensure a 'whole of government' approach. In practice this has not happened. Either the agencies and committees have not met regularly or they have not established the necessary actions and monitoring mechanisms in specific sectors.⁴⁶ Moreover, the coordinating agencies may still be working in silos without effective outreach to various development sectors. Many high-level functionaries of these agencies have been drawn from the armed forces, police and civil defence, and too often they have primarily followed their previous interest—disaster response and preparedness—rather than integrating DRR with other sectors.

The HFA prescribed 'multisectoral national platforms, with designated responsibilities at the national through the local levels to facilitate coordination across sectors', but, as of 2013, only 14 out of 64 countries in Asia and the Pacific have set up such platforms, and none of them meet regularly.⁴⁷

POLICIES AND PLANNING

While there are national policies and strategic action plans on disaster risk management in many countries in the region, there is often no clear guidance on how these are to be integrated across government sectors – resulting in considerable gaps between professed policies and plans, and actual practices (Box V-3). Policy implementation across the Asia-Pacific region broadly differs according to level of development. The developed countries have invested enormous resources on structural and non-structural measures for disaster risk reduction in various sectors. The emerging economies that face high disaster risks have also started making such investments with some success – and have introduced low-cost community-based initiatives for risk reduction.

- *Bangladesh* – The National Plan for Disaster Management (2010–2015) has a five-fold strategy for integrating disaster risk reduction: advocacy, policy and planning reform, capacity building, planning frameworks, and uniform community risk assessment. The country has also made significant progress in integrating disaster risk reduction in poverty reduction programmes. This success has been due in part to a participatory risk assessment, a focus on the multidimensional nature of poverty, convergence of all development programmes at community level, and coordinated involvement of all development partners, with strong presence of civil society and women.
- *China* – The National Disaster Reduction Plan (1998–2010) was followed by the Comprehensive Disaster reduction Plan (2011–2015). These plans aimed to establish a unified management structure, bringing all levels of government together. Many recent initiatives in the country are based on the realization that rapid economic development in the past has created new risks of disasters which should be addressed in a comprehensive manner.
- *India* – The Planning Commission developed a blueprint for disaster risk reduction in Tenth Five Year Plan (2002–2007). This underlined the need for a multi-pronged strategy for total risk management, comprising prevention, preparedness, response and recovery, along with development efforts aimed towards risk reduction and mitigation.⁴⁸ The Twelfth Five Year Plan (2012–2017) emphasized that every new development project should be appraised on the basis of detailed assessment of hazards, risks and vulnerabilities, while every existing project should be retrofitted for the risks of disasters. The actual implementation, however, has fallen far short of the vision.
- *Indonesia* – The Government has a National Action Plan for Disaster Risk Reduction which is updated for successive three-year planning cycles. Each cycle identified more than 600 activities for disaster risk reduction across sectors– which required significant financial and technical support from multiple stakeholders and donors. Many of these could not be implemented since the support was not forthcoming; nevertheless, the plan catalysed new ideas and initiatives, created public awareness and provided rallying points for multi-stakeholder participation.
- *Japan* – The Basic Disaster Management Plan is continuously updated and has helped reduce vulnerabilities and strengthen the resilience of urban and rural communities. But the country remains at risk from complex disasters, as demonstrated by the 2011 earthquake, and the country is integrating the lessons learned.
- *The Republic of Korea* – The country has been building the resilience of critical infrastructure

Disaster risk management: the divorce between discourse and practice

The disaster risk management sector in general has developed only weak connections with, and influence on, development sectors, and it has often lacked the political authority, governance arrangements and technical competencies to do so. Many development policies, plans and investments continue to enjoy political support even if they generate and accumulate risks.

Prospective disaster risk management generally requires lower levels of financial investments but higher levels of political capital and support than corrective disaster risk management. Given that disaster risk management has been understood and put into practice as a set of instrumental and administrative mechanisms to protect development against exogenous threats, this political support has rarely been forthcoming. At the same time, development sectors also tend to understand disaster risk management as disaster management.

As a result, the disaster risk management sector has little success in ensuring that other ministries or departments adopt policies, norms, standards and regulations to manage and reduce risks. Similarly, there has been little systematic engagement with the private sector in most countries, except through the lens of corporate social responsibility.

In effect the strong political determination by the HFA to promote and integrate disaster risk reduction into development programming has rarely materialized. The practice of prospective disaster management continues to be more symbolic than real. As the HFA comes to a close, it is difficult to identify countries where the strengthening of disaster risk governance has seriously influenced the direction of development.

Source: UNISDR, 2015b.

such as roads, railways, energy, communication systems and housing. One focus area is making cities more resilient to floods.

- *The Philippines* – The Strategic National Action Plan 2009-2019 identified 18 programmes and projects on disaster risk reduction. These include: (a) mainstreaming DRR in various government plans and programmes and (b) supporting DRR mainstreaming through sectoral approach.⁴⁹ The National Economic Development Authority is developing guidelines for regions and provinces to build DRR into local development plans such as the Provincial Physical Framework Plan, Comprehensive Land Use Plan, and Comprehensive Development Plan.

- *Singapore* – High physical and environmental standards of safety have helped protect from major natural or technological disasters, though in the long run there may be threats from sea level rise.

However, most of the region's developing countries lack the necessary resources and capacity and in many of the least developed countries the limited initiatives are mostly driven by UN agencies and donors with little buy-in from local government agencies. Implementation is also generally constrained by weak local capacities.

- *Cambodia* – The Strategic National Action Plan for Disaster Risk Reduction has as one of its six key components, mainstreaming DRR

into policies and programmes for relevant government ministries,⁵⁰ but implementation has not made much headway.

- *Lao PDR* – The Strategic Plan on Disaster Risk Management provided road maps for the short term (2005), medium term (2010) and long term (2020). Some of the short- and medium-term activities have been implemented, but the long-term activities for integrating disaster risk reduction in various sectors of development have not.
- *Myanmar* – The Action Plan on Disaster Risk Reduction identified 13 priority projects for DRR, but none has passed the inception stage.
- *Timor-Leste* – The National Disaster Risk Management Policy guides risk analysis, vulnerability monitoring, early warning, emergency management, post-disaster research and review, recovery and knowledge development, awareness raising and human resource development. There is no initiative for integrating disaster risk reduction in development.
- *Pacific island States* – Most governments have had some form of national disaster plan for many years. UNDP has also helped develop more comprehensive plans, covering preparedness, response and recovery activities. But implementation has often been hampered by the limited interest of governments and the shortage of suitable funds and human resources. Some countries are receiving support from the Pacific Disaster Risk Management Partnership Network for DRM National Action Plans. Tonga is the first country to develop a Joint National Action Plan for Disaster Risk Management and Climate Change Adaptation.

FINANCE AND BUDGETS

Reports on implementation of the HFA commonly refer to a shortage of funds, either from national resources or from official development assistance (ODA). In the Asia-Pacific region, over the past decade prevention and preparedness accounted for only 0.65 per cent of total ODA.

Countries that have special funds for disaster risk management have mostly used these for disaster response and humanitarian relief. In India, for example, the Disaster Management Act 2005 mandated the creation of two dedicated funds at national, provincial and local levels – the Disaster Response Fund and the Disaster Mitigation Fund, though the latter has yet to be constituted (Box V-4). Pakistan and Bangladesh have also created national funds but only use these for disaster relief and rehabilitation. Most countries, however, do not have such funds, instead relying on the general budgets of the national, provincial and local governments.

Some countries have separate budgetary codes for natural calamities, but none has separate codes for disaster risk reduction. Nevertheless, in different development sectors they devote funds to structural and non-structural measures. Taken together such investments usually far outweigh the contribution of international aid for disaster risk reduction – and the gap could widen still further as a result of slow economic growth in donor countries.⁵¹

- *The Philippines* – Over the period 2009–2011, the budget allocation in the General Appropriation Act expanded by 61 per cent, but still comprised only 2.12 per cent of the national budget and 0.28 per cent of the GDP.⁵² Even so, in the Philippines the Government invests 20 times more than the international community on disaster risk reduction.⁵³

- *Indonesia* – Regulation 21 of 2008 classifies DRR investments in seven categories aligned with the Hyogo Framework of Action.⁵⁴ Based on these, during 2006–2012 there were 71 DRR-related activities. Over this

period, the proportion of the national budget devoted to disaster risk management rose from 0.38 to 0.69 per cent. Of the total investment on DRR, disaster mitigation and prevention accounted for on average 76 per

BOX V-4

Tracking public investment on disaster risk reduction in India

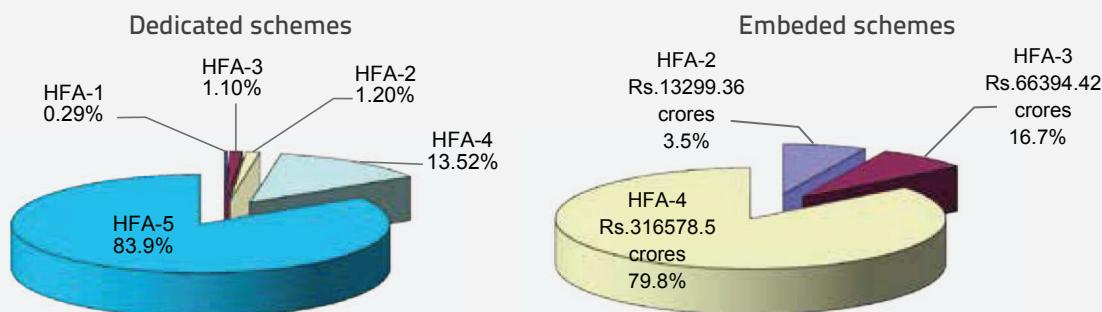
National accounting systems generally do not generate disaggregated data for monitoring the resources allocated for disaster risk reduction. In India a study that tracked allocation of resources on programmes, activities and projects (PAP) in the budgets of 75 ministries/departments of government during 2005–2012 provide significant insights.

When 100 per cent of budgetary allocations were earmarked for disaster risk management they were categorized as 'dedicated schemes'. When the allocations were less than one hundred per cent they were classified as 'embedded schemes'. These were further classified according to the five priorities of the Hyogo Framework of Action. While the share of dedicated schemes never exceeded 1.2 per cent of total budgetary allocations, the share of embedded schemes was as high as 33.6 per cent.

Budget allocations for disaster risk management, INR billion

Financial Year	Total Budget Allocations	Dedicated Schemes	%	Embedded Schemes	%
2005-06	5,143.4	58.3	1.13	1,235.7	24.03
2006-07	5,639.9	68.6	1.22	1,505.3	26.69
2007-08	6,805.2	62.7	0.92	2,227.8	32.74
2008-09	7,508.8	70.6	0.94	2,304.9	30.70
2009-10	10,208.3	95.8	0.94	3,302.5	32.35
2010-11	11,087.5	114.2	1.03	3,728.4	33.63
2011-12	12,377.3	117.1	0.95	3,962.7	32.02

DRR elements in PAPs are so embedded that it is not possible to quantify them precisely, unless there are separate budgetary codes. Contrary to general perceptions, it was found that while nearly 84 per cent of allocations on dedicated PAPs were spent on disaster response and preparedness, nearly 80 per cent of allocations on embedded schemes were related to addressing the underlying risk factors.



Source: Chakrabarti, 2012.

cent, followed by disaster preparedness (12.7 per cent), research, education and training (5.8 per cent), early warning systems (3.3 per cent), institutional capacity building (0.8 per cent), community participation for DRR (0.7 per cent) and disaster management planning (0.5 per cent). In 2011, about 14 per cent of the DRR budget was mobilized from foreign loans and grants, mostly for construction of flood control facilities and infrastructure.

- *India* – A study⁵⁵ that analysed expenditure based on the HFA classification found that 38 schemes of eight ministries or departments were for ‘dedicated’ schemes (all for disaster risk management).⁵⁶ In addition, 75 ministries or departments had 85 ‘embedded’ schemes which had elements of risk reduction. In 2011-2012 these amounted to \$2.1 billion-32 per cent of the total government budget, so around one-third of the budget was spent on schemes that had some elements of disaster risk reduction.

Governments can better integrate disaster management in finance and budgets by stepping up direct or dedicated public and private investments, while also recalibrating existing development schemes in different sectors to optimize their potential for reducing disaster risks.⁵⁷

DECENTRALIZATION

DRR should not remain centralized in the national government. It should be a joint responsibility of all levels of government – national and local – with the participation and engagement of all stakeholders and communities. Decentralization in the Asia-Pacific region takes a number of forms. The weakest is ‘deconcentration’

– partial dispersal of tasks and resources from the central to local government with no devolution of authority – as, for example, in Cambodia, Myanmar, Pakistan and Sri Lanka. A stronger form is ‘devolution’ which also involves partial dispersal of resources and authority – as in Bangladesh, India, and Viet Nam. The strongest form is ‘autonomy’ where for certain functions the government disperses tasks, resources and authority – as in Indonesia and the Philippines – a model particularly appropriate for countries with vast territories and dispersed islands and archipelagos.

- *India* – The Disaster Management Act of India has created disaster management authorities at national, state and district levels, but stopped short of entrusting specific responsibilities to rural and urban local self-governing institutions.
- *Indonesia* – The Law Concerning Disaster Management provided for the creation of regional disaster management agencies and further outlined the rights and obligations of communities and business establishments.
- *The Philippines* – The Philippine Act has created provincial, city, and municipal disaster risk reduction and management councils and provided these councils with structured offices and funds. This was considered necessary to enable them to discharge their responsibilities in widely dispersed island settlements.

Decentralization should promote good governance as it can improve service delivery, involve citizens and make the system more open and transparent. Further it can promote community-based risk assessment, risk reduction and preparedness and enable effective utilization of local knowledge and resources. In addition it improves two-way risk communication between local and national levels. It enables participation of multiple stakeholders including civil society, community-

based organizations, local leaders and other opinion makers. In short, decentralization empowers local communities.

To be effective therefore, vertical and formal decentralization by horizontal and informal decentralization – among all stakeholders across all sectors. In most countries, however, this mix of vertical-horizontal decentralization has yet to take hold. Either vertical decentralization has been top down without effective devolution of power and resources, or it has remained formal without effective engagement with stakeholders. The mid-term review of the HFA found that although 86 countries had made local governments legally responsible for local disaster risk management, only 20 had dedicated budget allocations for local governments.⁵⁸

Most countries have a large gap between policy and action. National Governments often make a commitment for community-based disaster management but fail to allocate the necessary resources, leaving the agenda in the hands of NGOs who have been managing small and scattered pilot projects.

Decentralization must also be supported by continuous and systematic efforts for strengthening the technical and institutional capacities of the local authorities. Most municipal authorities lack the capacity to assess local risks or to design and implement local-level programmes. In India, for example, only a handful of municipalities have revised their building codes to incorporate structural safety from natural hazards like earthquakes, floods and cyclones – as provided



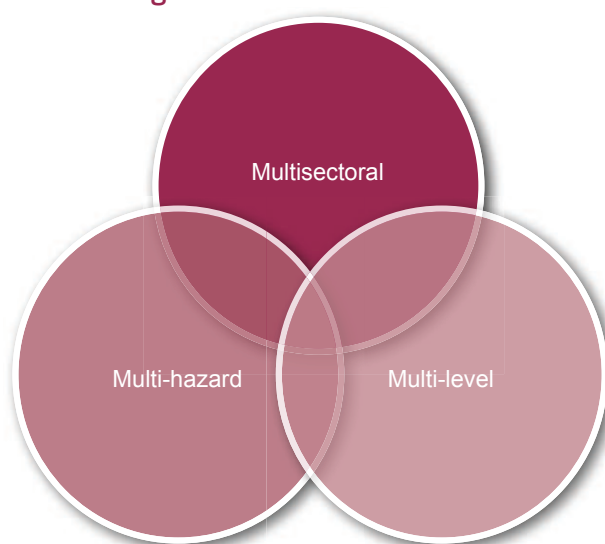
in the National Building Code.⁵⁹ The collapse of the multi-storey Rana Plaza garment factory in Bangladesh, for example, was in part a consequence of weak municipal administration. Many more such buildings in different hazard zones across Asia and the Pacific have been described as ‘weapons of mass destruction’.⁶⁰ Building codes have to be enforced by local authorities – such responsibilities can neither be transferred to regional or national governments nor delegated to civil society or NGOs.

CAPACITY BUILDING AT ALL LEVELS

Capacity development for disaster risk reduction should not be limited to the national agency for disaster management. It must permeate all sectors, at all levels and for all types of hazards, natural and man-made (Figure V-1). In the case of construction, for example, designing or retrofitting buildings so as to be earthquake resistant will mean increasing the capacities of architects, engineers and masons.

FIGURE V-1

Capacity building framework for disaster risk management



But it also means enhancing the supervisory and enforcement capacity of officials in different sectors and at all levels of government.

Capacity building for disaster risk reduction is a massive task that has to be undertaken in an organized and systematic manner. It will mean assessing capacity gaps – for all sectors and all types of hazard, and working out the strategies to fill them. For high-level policymakers – legislative, ministerial and bureaucratic – some capacities can be upgraded through sensitization programmes. For middle-level officials, capacities can be refreshed through knowledge- and information-based programmes. For technical experts, capacities can be strengthened through skills development. For common citizens and communities, they can be developed through awareness programmes. This would require large number of trainers – and programmes for training the trainers.

At the same time countries will want to improve their institutional expertise. Universities and other institutions of higher learning can develop academic programmes in various disciplines to develop a pool of professionals on disaster risk management, while research institutions can take up scientific, policy and applied research.

Several countries in Asia and the Pacific have created specialized institutes for training on disaster management. In India, for example, the National Institute of Disaster Management has been developing capacities across sectors at national and state levels, while China’s National Disaster Risk Reduction is providing similar training. In Singapore the Civil Defence Academy provides specialized training for disaster response, specifically for urban fire management. In the Philippines the work is done by the Crisis Management Institute which is part of

the National Defence College. Indonesia has a Disaster Relief Training Ground. In Myanmar the Disaster Management Training Centre is now being set up. ESCAP through its Regional Network of Knowledge and Innovation Centres initiative is partnering with the institutions in China, India and Indonesia to help them share their capacity-building programmes with other countries that have low coping capacity.

Cross-border learning

Regional platforms are uniquely positioned to foster genuine and durable partnerships and cooperation. This is particularly the case in disaster risk reduction, as disasters frequently have cross-border impacts. Learning from one another could be useful for doing things right or avoiding certain actions that may not work. Regional learning platforms can also serve as clearing houses where countries could place their demands and supply for DRR methods, tools, products and practices that are, otherwise, not easily accessible to inform national processes. Such cooperation would be useful for monitoring and reporting on progress, undertaking peer reviews and sharing lessons. There are several regional level capacity development initiatives for DRR that are at various stages of implementation (Box V-5).

There are good examples of regional initiatives for sharing knowledge and technology, such as ESCAP's Regional Space Applications Programme for Sustainable Development (RESAP) and its Regional Drought Mechanism (Chapter 4). Similarly, as highlighted in Chapter 3, countries can work together to make more efficient use of limited public resources, for example by pooling resources for disaster preparedness and early warning, as demonstrated through the ESCAP's Multi-

donor Trust Fund for Tsunami, Disaster and Climate Preparedness. There are also good examples of countries, especially in the Pacific, addressing shared vulnerabilities and risks through regional insurance pooling facilities.

STRATEGIC FRAMEWORKS AND NATIONAL GUIDELINES

Following the adoption of the Hyogo Framework of Action in 2005 some efforts were made to develop general guidelines for integrating disaster risk reduction in development, but these were not systematically pursued. Guidelines have also been produced by other institutions – for example, suggesting key policy areas such as: policy, strategy, geographical planning, project cycle management, external relations and institutional capacity.⁶¹ The Pro Vention Consortium has also developed a series of 14 guidance notes for mainstreaming disaster risk reduction.⁶² There have also been initiatives from many other institutions, global and regional, for integrating DRR into development planning (Box V-5).

It is clear, however, that the actual practice of integrating DRR into development planning will depend upon national circumstances – on the hazards faced, the level of development, and the country's capacity. In general, however, it will involve three interconnected processes: a strategic framework within the national development plan; national guidelines; and sectoral guidelines (Figure V-2).

Strategic frameworks

The overarching strategic framework for disaster risk management in a national development plan may be laid down by the national planning commission or a similar institution.

BOX V-5

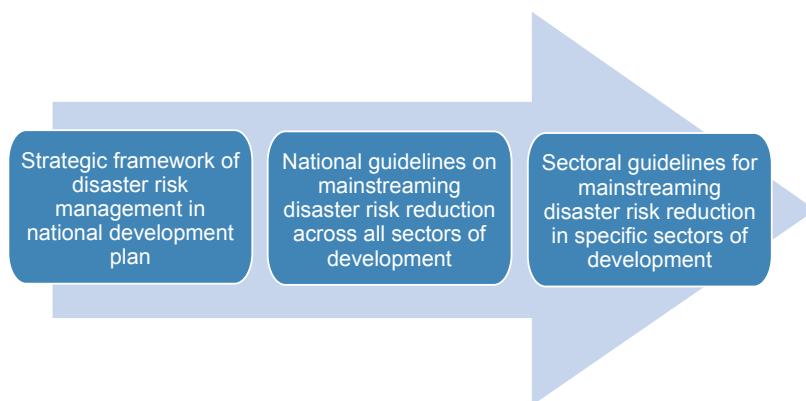
Initiatives for integrating disaster reduction in development planning

There have been a number of initiatives, global and regional, to help countries integrate disaster risk reduction into development planning. These include:

- **ADPC** – the Asian Disaster Preparedness Centre (ADPC) has been promoting the agenda of Priority Implementation Partnerships for mainstreaming disaster risk reduction in different sectors of development. The first phase (2005-2007) was taken up in the Philippines, Cambodia and Lao People's Democratic Republic; the second phase (2008-2011) in Bhutan, Lao People's Democratic Republic and Sri Lanka along with regional-level programmes. In the third phase (2012-2015) the programme was extended to issues of agriculture, infrastructure, urban development, health and financial services, followed by a programme for integrating disaster risk reduction with climate change adaptation in development.
- **ASEAN** – The Association of South East Asian Nations adopted the AADMER Work Programme which included assistance to the member States in mainstreaming disaster risk reduction into national development policies, plans and sectoral programmes.
- **ESCAP** – The Regional Commission has launched a regional programme on the integration of disaster risk reduction into development planning to support member States' efforts to create more disaster-resilient economies and societies. The programme has brought together key ministries with mandates in national development planning and financing and the nodal agency in charge of disaster risk reduction policy. These can then engage in dialogue with other sectoral ministries to integrate disaster risk reduction into multiple sectors. The programme develops guidelines for integrating disaster risk reduction into multisectoral and subnational development planning. It also develops tools for pre-disaster risk assessment for development planning, and for rapid post-disaster damage assessment for recovery planning.
- **SAARC** – In 2006, the South Asian Association for Regional Cooperation (SAARC) adopted its Comprehensive Disaster Management Framework, which aimed at 'mainstreaming disaster risk reduction into the development policies and practices of the government at all levels'. As a follow up measure, the *SAARC Disaster Management Centre developed the SAARC Road Map on Mainstreaming Disaster Risk Reduction in Development* through a consultative process. The implementation of the roadmap did not make much headway.
- **SIDS** – In September 2014 the third International Conference on small island developing States (SIDS) adopted the SIDS Accelerated Modalities of Action. This called for mainstreaming policies and programmes related to disaster risk reduction, climate change adaptation and development.⁶³
- **SOPAC** – The Pacific Islands Applied Geoscience Commission (SOPAC) adopted the Pacific Disaster Risk Reduction and Disaster Management Framework for Action 2005-2015 which called for member governments to strengthen policies and plans for the mitigation and management of natural disasters through the development of National Action Plans.
- **UNDP** – The Global Report of the UNDP on 'Reducing Disaster Risks: A Challenge for Development' recommended that disaster risk analysis must be conducted for every development programme.⁶⁴
- **World Bank** – Track-II of the Global Facility for Disaster Reduction and Recovery of the World Bank was designed to mainstream disaster risk reduction in development in priority countries. Activities focused on some of the basic issues of disaster management like hazard mapping and national DRR policy.⁶⁵

FIGURE V-2

Interconnected processes for integrating disaster risk reduction into sustainable development



This framework for a medium to long-term planning cycle (five to ten years) may be developed in consultation with all relevant stakeholders, including the central ministries and departments, state governments, scientific and technical institutions and experts. Thus far, few national planning commissions in the Asia-Pacific region have developed such a framework. The Planning Commission of India did so in its Tenth Five Year Plan but did not include it in subsequent plans.

National guidelines

The nodal agency on disaster risk management can develop general principles and guidelines in consultation with all sectoral ministries and departments. These should apply to every programme, activity and project across all development sectors. As yet no country has developed such generic guidelines. But some have issued guidelines for disaster impact assessments of major development projects.

- *Bangladesh* – The Government has introduced Disaster Impact and Risk Assessment for analysis of all development projects.
- *Sri Lanka* – For all development projects, the Disaster Management Centre has produced the Disaster Impact Assessment

checklist. This is in four parts – assessing risks, incorporating risk reduction measures into designs, monitoring during construction and maintenance, and analysing post-disaster impact assessment. This has been field tested in the road sector and is to be introduced in other sectors.

- *India* – On the recommendation of the National Disaster Management Authority the Ministry of Finance has issued a Check List for Natural Disaster Impact Assessment. Any new project costing more than INR1,000 million must provide complete information on its hazards, risks and vulnerabilities. This would include not only the probable effects of natural disasters on the project but also its potential for creating new risks. This was an important step forward, even though this is self-assessment by the project implementing agencies rather than an independent evaluation by a body of experts.
- *Indonesia* – The National Disaster Management Agency has developed a disaster risk index as a tool for assessing the vulnerabilities of districts and municipalities and prioritizing the allocation of resources for planning various structural and non-structural measures for risk prevention and mitigation.⁶⁶

The UN General Assembly has established an open-ended intergovernmental working group for developing a set of indicators for measuring global progress in the implementation of the Sendai Framework – in conjunction with the work of the Inter-Agency Expert Group on Sustainable Development Goal Indicators. This could also include indicators for measuring progress in integrating disaster risk reduction in development.

Sectoral guidelines

In consultation with the national authority on disaster management, each sectoral ministry and department can develop its own guidelines on disaster risk reduction. This would ensure that while the process is owned and driven by the unique demands of the sector, it also conforms to the overall national framework.

As a minimum, each sector needs to integrate disaster risk management principles in the following three areas:

- Policies, strategies and directives – Integrating disaster risk reduction into sectoral development plans and budget
- Key infrastructure – Risk reduction measures to protect facilities and assets
- Continuity plans – For maintaining critical services and supporting timely recovery and reconstruction

Although the relevant sectors will differ according to national circumstances, broadly they are likely to cover:

- Social sectors (health, education, housing and human settlements)
- Productive sectors (agriculture, manufacturing, business)
- Infrastructure sectors (roads and bridges, water supply, power transmission and distribution, communications)

- Cross-cutting sectors (poverty reduction, gender issues)
- Multisectoral planning processes (urban and rural development)

The following discussion illustrates how disaster risk management can be integrated into different sectors.

SOCIAL SECTOR

Across the region a wide range of development and social protection schemes have helped to reduce the vulnerabilities of large segments of population, enhance their capacities and reduce the risks of disasters. But some have also created new risks. For example, many new schools built in earthquake zones in China and Pakistan subsequently collapsed. This could have been avoided had they been constructed following building codes for earthquake resistance. Similarly, many people have been lifted out of poverty as a result of government subsidies and credit schemes that they have used to acquire income-generating assets – only to sink back into poverty when the assets were destroyed during floods or cyclones. These losses would have been reduced had the assets been secured through insurance or other securities.

Health

All health sector programmes, activities, projects and critical infrastructure should be protected from the risks of disasters, and further strengthened so they respond during emergencies.

- *New buildings* – Health care facilities, such as hospitals, primary health centres, dispensaries, and trauma centres should be built following disaster resistance principles and building codes, even if this adds to costs.

- ## Education

Education systems from primary schools to universities and management schools should have their infrastructure, programmes, and activities be protected. They should also have sufficient resources to help create a culture of disaster prevention and preparedness and raise a professional pool of expertise.



- *Disaster management education* – All children should be aware of the hazards they face and the measures they can take to protect themselves at school and at home. This would require revising school curricula, developing text books and teaching aides, and training teachers
- *Advanced courses* – Disaster risk reduction requires advanced scientific, technical and professional skills on subjects like earthquake engineering, meteorology, hydrology, communications technology, disaster medicine, psycho-social care, and emergency management. Colleges, universities, and technical and professional institutes should design the necessary courses in all key areas of specialization.
- *Safe buildings* – Each new school building should be designed to be resistant to earthquakes and other disasters. And existing schools that are unsafe should be retrofitted. Given the scale of the need, education departments may initially have to prioritize schools in high-risk zones before extending the programme nationally.

PRODUCTIVE SECTORS

Agriculture and businesses are exposed to disasters and can also create the conditions for disasters. Most are owned by private entrepreneurs but governments can offer support and create conditions that will enable them to minimize risks. It is essential that these risks are assessed and analysed in a comprehensive manner.

Agriculture

Agriculture is particularly vulnerable to natural hazards like flood, drought, and saline water

intrusion – with impacts on rural livelihoods and national food and nutritional security. At the same time, agriculture itself can increase disaster risks – through soil erosion, land degradation and deforestation, for example, and overuse of groundwater.

Making agriculture more resistant to the risks of drought and flood will require a range of programmes. These can address such issues as: protecting agricultural infrastructure; soil and water conservation, water harvesting, improved varieties of seeds and bio-fertilizers, drip irrigation, and weather forecasts. Agricultural research and extension services can also be reoriented to find innovative ways of adapting to the impact of climate change. Many Asia-Pacific countries are taking measures to address climate change adaptation and disaster risk reduction. There are innovative traditional and modern practices that can be disseminated for the benefits of farming communities.

Business

Driven by trade and investment, and continued demands for cost reduction, businesses have been extending their activities across the region, often in coastal and other disaster-prone areas.⁶⁷ In general, businesses, including industry, trade and commerce, tend to take little account of the risks of disasters – though they stand to make heavy losses from disruptions to supply chains. Few small and medium-sized enterprises have continuity plans to deal with such situations; and only a few global corporations collaborate for this purpose with national and local governments. The ESCAP report, *Resilient Business for Resilient Nations and Communities*, called for a paradigm shift in the way private sector perceives and manages disaster risks (Box V-6).⁶⁸

The private sector should be encouraged to adopt or improve business continuity and resiliency planning, and factor disaster risk into overall corporate planning and investment, business analysis and forecasting. These are issues that need to be addressed in business schools. In Japan, for example, following the 2011 earthquake the Government developed guidelines and incentives. International standards for business continuity were issued in 2012 in ISO 22301 which included taking into account the risk of disasters.

For this purpose businesses will need to work more closely with governments.⁶⁹ Traditionally, enterprises and business associations have done so by contributing funds or other resources for disaster relief and rehabilitation – as part of discharging their corporate social responsibilities. Now they need to go further and not only protect themselves but also help make society

as a whole more resilient. The HFA prescribed ‘public-private partnerships to better engage the private sector in disaster risk reduction activities’.⁷⁰

Some businesses are already doing so, by investing sizeable resources in rural areas in agro-business, horticulture, poultry, fisheries and other sectors. For example, they have helped boost incomes in disaster-prone areas by introducing modern technologies of irrigation, plantation, hatcheries, breeding, processing, packaging, storage, and supply chains. This enables farmers, fishermen and other communities to cope with the risks of droughts, floods, and sea storms. One innovation in this area is the 5P model of ‘pro-poor-public-private partnerships’ – hybrid organizations involving government, the corporate sector, civil society and NGOs. Such models can be replicated in other sectors such as water and sanitation, rural and urban development, renewable energy.⁷¹

BOX V-6

A paradigm shift for business

The private sector and governments, national and local, can work together towards a sustainable future that has collective benefits for society at large. Although the private sector has become more aware of the threats that disasters pose to their interests, nevertheless, aiming to maximize profits, many businesses are myopic, focusing on short-term gains instead of long-term benefits for all.

Rather than remaining passive players, the private sector must actively reduce risk. This will require a paradigm shift from reactive and responsive interventions towards proactive, risk-sensitive business investments. Businesses also need to be held accountable for their own share of risk creation. This is important for the survival of both businesses and society at large. Instead of engaging in limited corporate social responsibility initiatives, they should choose interventions that provide wider societal benefits. Governments should therefore foster greater private sector involvement by providing sound legal and regulatory frameworks, timely risk information and other incentives and support, particularly to SMEs.

Source: ESCAP, ADPC and R3ADY, 2015.

INFRASTRUCTURE

Rapid economic development across Asia and the Pacific has required extensive infrastructure. This includes roads and bridges, railways and metros, seaports and airports, power plants and transmission lines, gas and oil storage depots, water supply systems and telecommunication networks, schools and hospitals, administrative headquarters and emergency operation centres.⁷² Much of this was constructed many years back and has yet to be upgraded for resilience to current risks. This has left many countries vulnerable. Examples in 2014 included floods and landslides in Nepal and floods in Solomon Islands which disrupted vital infrastructure including roads, water and sanitation facilities.

All new critical infrastructure should be constructed with a high margin of safety and all existing critical infrastructure, in both public and private sectors, should be audited and upgraded to international standards to cope with worst-case scenarios. This will require a comprehensive strategy – mapping all critical infrastructure, reviewing standards and codes, reducing exposure and strengthening resilience.⁷³ All the major infrastructure ministries and departments—roads and highways, shipping, railways, communications, and energy—will need to incorporate disaster risk reduction in current and future activities.

CROSS-CUTTING ISSUES

Many development priorities cover a number of sectors. Poverty reduction, for example, concerns agriculture, employment, and industry, as well as multisectoral processes like rural and urban development. This is also true of other issues like gender equality, child protection and disability.

Poverty reduction

Working with poor communities, governments should analyse the major disaster risks faced by the poor, as well as their current survival and coping strategies. They can then select appropriate measures to prevent or reduce those risks. This has important implications for poverty alleviation programmes. These should incorporate elements to protect income-generating activities from the financial impact of disaster – such as micro-credit and micro-insurance. Bangladesh, for example, has developed tools for participatory risk assessment, focussing on the multidimensional nature of poverty with coordinated involvement of all development partners at the community level and a strong presence of civil society and women.

There should also be schemes to provide livelihoods for the poor should disaster strike. In India, for example, the National Rural Employment Guarantee Programme has been used to provide livelihood support to people affected by droughts, floods and cyclones.

Gender

Women should be involved at all stages of disaster risk management. At present most governments have limited understanding of how gender relations affect risk accumulation and coping capabilities. They can start with a careful analysis of gender-based inequalities and relations in society and the attitudes that affect women's vulnerability to hazard impacts and their capacities for recovery.

Deciding what risks to reduce and how to do so will mean considering the responsibilities of women during and after disasters, and ensuring gender-sensitive risk communication messages and programmes.

MULTISECTORAL LOCAL PLANNING

Much of the responsibility for disaster risk reduction lies with local governments. They have to execute disaster preparedness plans and are likely to be the first responders when disaster strikes. With the greatest experience and knowledge of local vulnerabilities and coping mechanisms they are best placed to ensure community-based disaster preparedness. However, the issues generally differ between rural and urban areas.

Urban development

Urban areas have complex systems of risks and vulnerabilities especially in the mushrooming slums in dangerous areas that are making poor people vulnerable to multiple risks. Most cities

have master plans and many have detailed regulations that define the purpose for which a particular zone of the city can be used – such as commercial, residential, institutional, recreational, and city forests or parks. Such plans should be disaster risk sensitive, taking into account location, elevation, geological composition, soil characteristics, the availability of surface and sub-soil water, and natural hazards. For example, flood plains should not be used for construction, and areas prone to liquefaction during earthquakes should not have high-rise buildings.

The biggest source of risk in Asia-Pacific cities is unsafe buildings in thickly congested areas. Historically most construction has not conformed to safe standards nor been designed for resistance to natural hazards like earthquakes and storms. Another problem is maintenance, which is



ESCAP PHOTO

often hampered by archaic tenancy and land ceiling legislation. As a result many dilapidated buildings have collapsed even without a natural disaster event.

The first priority in most cities is the preparation and enforcement of building codes. Given the lack of capacity of most municipal authorities this is a daunting task. But it is important to make a start. Each city needs to develop its own strategy to identify and reduce the stock of unsafe buildings. This may require demolition or retrofitting – for which there could be both incentives and penalties for non-conformance.

The HFA prescribe ‘incorporation of DRR in the planning and management of disaster-prone human settlements’ and ‘revision of existing or development of new building codes’ with priority focus on ‘informal housing in high-risk areas’. This did trigger some new initiatives but has not made a substantial difference. The region still has rapidly growing informal settlements and many unsafe construction practices.

Future policy should be based on a more comprehensive framework. This could include: relaxing land ceiling laws to release more land for housing; granting titles to slum dwellers to encourage investment in housing; lifting arbitrary rent control to improve the conditions of houses; developing satellite towns to decongest cities; providing subsidized housing for the poor; and developing capacity and accountability for enforcing building by laws. Giving urban dwellers title to their property encourages them to invest in their safety, and lifting rent controls creates incentives for landlords to comply with building codes, since they can then recoup the cost.⁷⁴

When enforcement is weak due to poor governance, it may be possible to engage

housing credit and insurance agencies to ensure independent inspections and compliance with building codes. Home purchasers too, if they are aware of the dangers can put pressure on builders to comply with the codes.

Rural development

Most Asian governments have ambitious programmes in rural areas for alleviating poverty and reducing vulnerabilities in the face of natural calamities like drought, floods, and cyclones. A few, like India and Viet Nam, have combined rural development schemes with relief activities like food for work programmes, but in most countries this has not been very systematic. All schemes for rural development and poverty alleviation need to be restructured so that they also reduce the risks of disasters.

CLIMATE CHANGE ADAPTATION

Disaster risk reduction (DRR) and climate change adaptation (CCA) are based on a common platform of sustainable development. After 1990 they branched in separate directions. DRR took the route of the International Decade for Disaster Reduction, the Yokohama Strategy and the Hyogo Framework of Action. CCA took the pathway of IPCC, UNFCCC, the Kyoto Protocol and the Conference of Parties. The two agendas converged again, however, when IPCC-4 concluded that a changing climate would have implications for disasters and the Bali Action Plan adopted at the COP-13 in 2007 included ‘disaster reduction strategies and means to address loss and damage associated with climate change impacts’.

In 2004 IPCC-5 came out with its special report on *Managing the Risks of Extreme Events and*

Disasters to Advance Climate Change Adaptation. Although climate change was only referred to in passing in the HFA, it received more attention in the Sendai Framework for Disaster Risk Reduction.

DRR and CCA have a number of synergies. Both aim to reduce vulnerability and have common tools to assess, analyse, monitor and address risks. Many of the disaster risk reduction measures have similarities with adaptation programmes – particularly those related to hydrometeorological disasters, such as drought proofing, flood protection, saline embankments and bio-shields, and alternative livelihood development. Thus, combining the two processes is likely to be more efficient and cost-effective (Figure V-3). At the local level in particular, the two must converge with clear plans of action, funding arrangements and guidelines for implementation and monitoring.

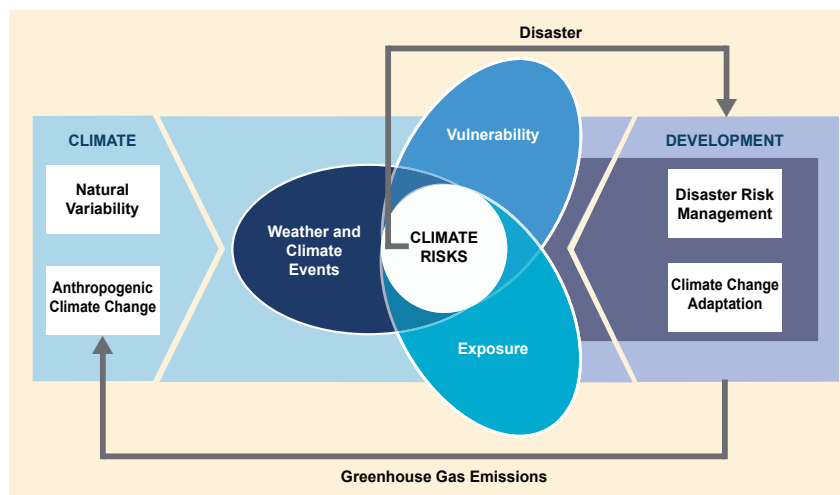
- *Maldives* – In 2011 the Government endorsed the world's first Strategic National Action Plan that integrated DRR and CCA

through an inclusive and consultative process. A unique feature of this plan was its focus on governance and decentralization.

- *The Philippines* – In 2009 the Philippines passed the Climate Change Act which emphasized the importance of integrating disaster risk reduction into climate change programmes and initiatives. The following year the Government passed the Philippine Disaster Risk Reduction and Management Act which mandates the State to develop, promote, and implement a comprehensive National Disaster Risk Reduction and Management Plan that would inter alia institutionalize arrangements for reducing disaster risks, including projected climate risks, and enhancing disaster preparedness and response capabilities at all levels.
- *Pacific Island States* – In 2015 these countries will launch a joint regional strategy to integrate disaster risk management and climate change issues at the regional, national and local levels. They will consider issues such as capacity building, financing, institutions and policies, and implementation for integration.

FIGURE V-3

Synergies between disaster risk management and climate change adaptation



Source: IPCC, 2012.

As a follow up to this process each country should explore how the common elements in DRR and CCA can be integrated through better coordination in planning, design and implementation.

New funding opportunities for integrating CCA with DRR should result from the Green Climate Fund which to be finalized in the new climate agreement in December 2015.

THE FINANCIAL BENEFITS OF DISASTER RISK REDUCTION

Integrating disaster reduction in each development sector will require additional expenditure, though not large sums. Countries are routinely constructing schools, hospitals, roads, and bridges, and often in hazard zones.

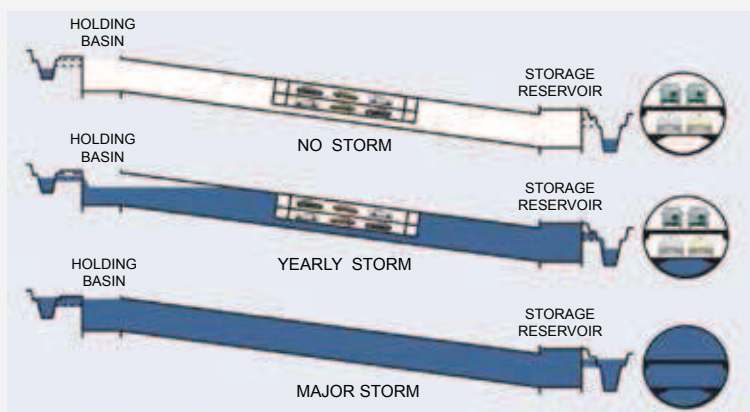
Making these structures resistant to earthquakes, landslides, flood or cyclones is a marginal cost. In the case of earthquake resistant buildings, for example, this has been estimated at 2.5 per cent for the structural elements and 0.8 per cent for non-structural elements such as partitions and ceilings.⁷⁵ The best projects are likely to have multiple benefits (Box V-7). But the processes may be demanding in other ways – redesigning programmes and projects and developing new standards, codes, guidelines and capacities.

While it may be straightforward to estimate the costs, it is more difficult to calculate the financial benefits. The damages and losses avoided are inherently uncertain; they depend on local circumstances, and on the distribution of losses between different groups. In most countries there is very little data on vulnerabilities and impacts and values. There are also debates around the

BOX V-7

A dual-purpose project: storm water management in Malaysia

Dual-purpose projects provide direct economic benefits while also reducing the risks of disasters. One of the most innovative examples is the 9.7-kilometre storm water management and road tunnel in Kuala Lumpur, Malaysia. This has three levels: the lowest for drainage and the upper two for road traffic. This reduces traffic jams during rush hours and also solves the problem of flash floods. This has another advantage – it ensures maintenance of a drain that otherwise would be used only sporadically.⁷⁶



Source: Mott Macdonald Group, 2009.

techniques for quantifying avoided losses and valuing non-market benefits and the choice of discount rates.

Generally, proposals for engineering projects such as embankments, sea walls or earthquake resistant buildings do not include analysis of the social, economic or environmental benefits, and even if these are mentioned they are rarely quantified. Most of the risk information and analysis is produced by the natural sciences and not connected to cost information examined by social sciences.

Overall, the economics of DRR have not yet matured into a sound subject of policy research. There is hardly any theoretical or econometric research on how a lack of investment in DRR has slowed down human, social or economic development.

In principle, risk assessment should be more straightforward for businesses. They are always dealing with opportunities and the associated risks. Not all risks are harmful, nor are they always a burden.⁷⁷ However the risks are not always assessed or priced properly. As a result, investments in otherwise attractive locations may come bundled with hidden contingent liabilities. The risk is often only revealed to investors when a major disaster occurs, as companies like Toyota, Honda, Nissan, Texas instruments and Hewlett-Packard learned to their cost following the 2011 floods in Thailand.

POLITICAL ECONOMY OF DISASTER RISK REDUCTION

Even if a private business factors the costs of hazards in its internal rate of return it will not generally take into account the external societal

or environmental risks it is creating. Governments for their part should be able to do so – to take a longer term and broader view and act in the public interest. Yet they may fail to do so. Most Asia-Pacific developing countries do not have legal, regulatory and governance mechanisms to ensure that public and private investments are fully protected from the risks of disasters and that these do not exacerbate existing risks. In these circumstances, some policymakers have been reluctant to invest in risk reduction though they will readily provide funds for the more obvious requirements of disaster response.⁷⁸

As the UN's 2015 *Global Assessment Report* concluded: 'In general, opportunities for short-term capital accumulation continue to outweigh concerns about future sustainability, resulting in massive discounting of all future risk, including disaster risk. The inadequate pricing of disaster risk and of broader externalities in economic activity means that disaster risk is discounted excessively in order to maximise short-term gains.'⁷⁹

The most obvious cause is pressure on resources. Many developing countries have very limited funds, and international development assistance is still ad hoc and heavily oriented towards humanitarian assistance. This dilemma is well expressed in the submission of Solomon Islands on HFA progress: "If policies based on risk information would lead to increased project costs, budget constraints may limit utilization of the risk information".⁸⁰ Even developed countries whose economic base has enabled them to absorb recurring losses due to disasters may not yet be convinced about the benefits of large-scale investments for disaster risk reduction.

Policymakers have to deal with competing demands for other seemingly more immediate priorities. And in competitive democratic politics

they are likely to be influenced by the power of various institutions, as well as by pressures from business, civil society, the intelligentsia and other stakeholders.

One countervailing force should have been the various newly created disaster management institutions. But even these tend to give priority to response. This is generally because of the backgrounds of their members who, often from the military, have more experience in this area. But government institutions also have an eye to public perceptions. Disasters averted do not exist, but disasters responded to are very visible in the news.

Nevertheless opinion is shifting. Some of this is due to the success of preparedness projects – which in the past decade have dramatically reduced disaster mortalities, especially for hydrometeorological disasters for which early warning is possible. At the same time mounting economic losses combined with the spectre of climate change are bringing disaster risk reduction and climate change adaptation into the centre stage of public policy discourse. Other positive signs include the success of regional and global platforms on disaster risk reduction, and the unprecedented participation of countries and other stakeholders in the recently concluded World Conference on Disaster Risk Reduction.

In Asia and the Pacific, one pioneering country has been Japan. During the 1960s, Japan invested heavily in various structural and non-structural measures for disaster risk reduction – around 8 per cent of the national budget. Without these measures the impact of earthquakes in 1995 and 2011 would have been much worse.⁸¹ In 2004 the Government issued Technical Guidelines for Cost Benefit Analysis of Public Work Projects. The Ministry of Land Infrastructure

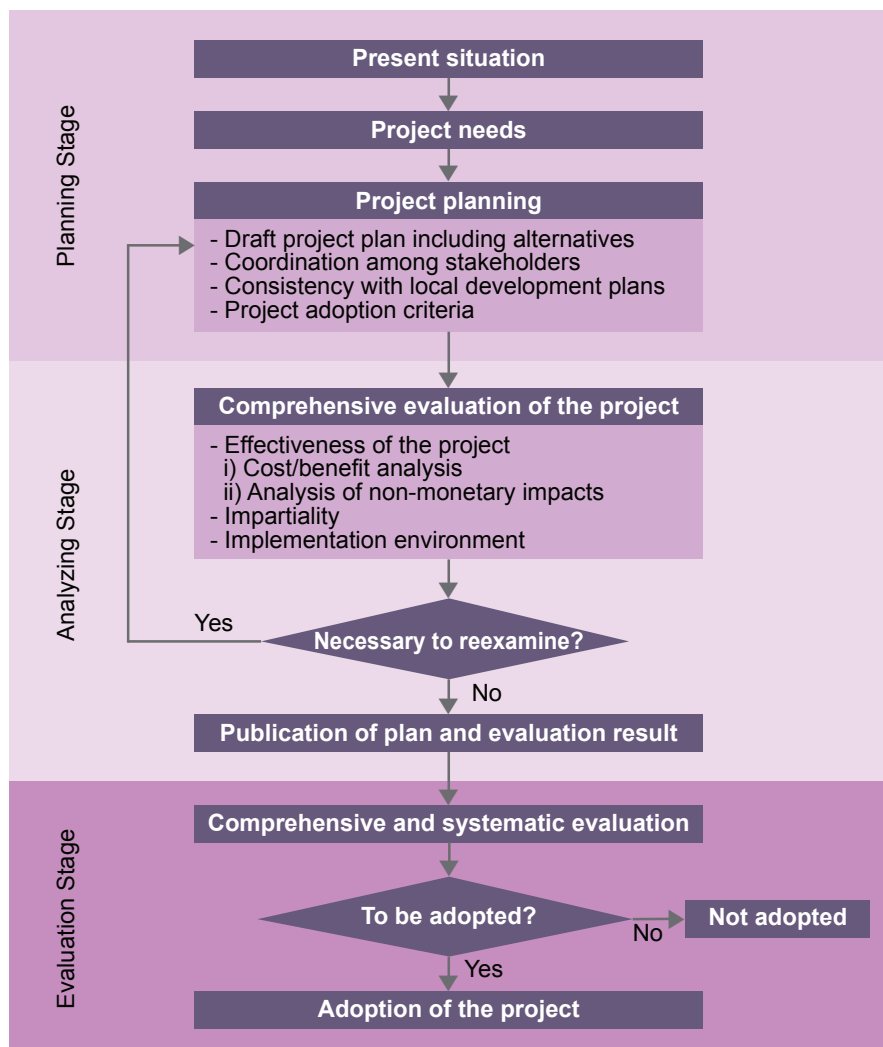
Transport and Tourism has also established a comprehensive process which ensures that all construction projects are designed such that no new risks are created while existing risks are reduced through co-benefits (Figure V-4).

There is also considerable empirical evidence of the financial benefits of mitigation from other Asia-Pacific countries.⁸²

- *Bangladesh* – A community-based disaster preparedness programme implemented over 15 years had a CBR of between 3.05 and 4.90 – an even this calculation excluded many benefits due to difficulties in collecting data.⁸³
- *China* – In the 1960s and 1970s, the Government invested \$3.15 billion for flood control measures that are estimated to have averted damages of over \$12 billion.⁸⁴
- *India* – A combined disaster mitigation and preparedness programme in Bihar and Andhra Pradesh had a CBR of 3.76.⁸⁵
- *Indonesia* – An integrated water management and flood protection scheme for Semarang had an internal rate of return of 23 per cent and a CBR of 2.5.⁸⁶
- *Nepal* – A livelihood-centred disaster risk reduction programme had a CBR estimated in 2011 of 2.04.⁸⁷ It should also be noted that in the Nepal earthquake of 2015 many buildings and infrastructure constructed with earthquake resistant technology survived – including 160 school buildings in the Kathmandu valley retrofitted under an ADB-supported school safety programme.⁸⁸
- *Viet Nam* – A mangrove plantation project in 1994 which cost \$1.1 million significantly reduced the costs of maintenance of dykes by \$7.3 million per year as well as saving lives and property.⁸⁹

FIGURE V-4

Japan: process for project evaluation of Ministry of Land, Infrastructure, Transport and Tourism



Source: World Bank, 2012b.

THE WAY AHEAD

Disaster risk reduction is set to occupy a larger space in the political economy of the countries of the Asia-Pacific region. The Sendai Framework has given clear goals and targets, the SDGs will open up windows of opportunity, and the

new climate deal should facilitate integration of climate change adaptation and disaster risk reduction. The task now is to translate these opportunities into action throughout the region – to ensure that every investment in all development sectors has a component for disaster risk reduction.

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