

## Chapter 14

# Risk Governance: In Search of the Missing Paradigm



Even in today's globalised economy, **national governments and local administrations** remain one of the most important mediators and **regulators of private investment** and thus disaster risk management. Governments report **significant progress** in achieving **effective disaster response and preparedness** and are investing more in risk reduction. Yet, the required shift towards **prospective risk management** remains a challenge for most.

The future of disaster risk reduction<sup>xii</sup> will depend on governments and **political leaders** becoming more successful at **combining** the promotion of local and national **economic growth with effective disaster risk management** on the ground. Thus, they will have to **expand their approach to risk governance** to include the creation of incentives for risk sensitive investment.

## 14.1 Evolving risk governance: evidence from the 2011–2013 HFA Monitor

**Results from national self-assessments of progress against the Hyogo Framework for Action (HFA) confirm countries' previously reported challenges, particularly in addressing the underlying drivers of risk.**

Risk governance, understood as a systemic approach to decision-making related to physical and technological hazards, has become an important concept for businesses and governments to effectively manage disaster risks (Fra Paleo, 2009; Renn, 2008; IRGC, 2005; IRGP-IHDP, 2010). Since the previous Global Assessment Report (UNISDR, 2011), which focused on public risk governance and associated government strategies, it has become apparent that risk governance structures and policies need to be expanded to include real consideration of the business sector, as well as civil society.

This is particularly pertinent, owing to evidence of rising economic loss risk from business investments in hazard-exposed regions. As highlighted in previous chapters, economic analyses and forecasts used by investors rarely mention disaster risk. Moreover, policy-makers in national government institutions and international organisations, although beginning to recognise changes in the nature of risks and risk management requirements, are still limited in their capacity to comprehensively assess and ad-

dress identified risks and future uncertainty (World Bank, 2012a; Kent, 2013).

In overall terms, HFA Progress Reports 2011–2013 (see Box 14.1) highlight broadly similar successes and challenges as reported in the 2007–2009 and 2009–2011 cycles.<sup>i</sup>

Risk governance arrangements established by countries and cities to manage their disaster risks have evolved significantly since 2005<sup>v</sup>.

From the 1980s onward, a growing number of countries reformed their legislation, policy and institutional frameworks for disaster risk management. Civil defence and protection organisations, focused on response, gradually gave way to a second generation of national systems for disaster risk management with common characteristics (UNDP, 2012a and 2012b; World Bank, 2012a; ADPC, 2003). Multi-sector committees now provide coordination and articulation across different ministries and departments; responsibilities are decentralised to local governments and dedicated budget lines for risk reduction activities are established.

As of December 2012, 85 countries had established multi-sectoral national platforms for disaster risk management; 191 countries had a dedicated focal point for disaster risk reduction in a central government department; and 121 countries enacted legislation to establish policy and legal frameworks for disaster risk reduction<sup>vi</sup>. But with notable excep-

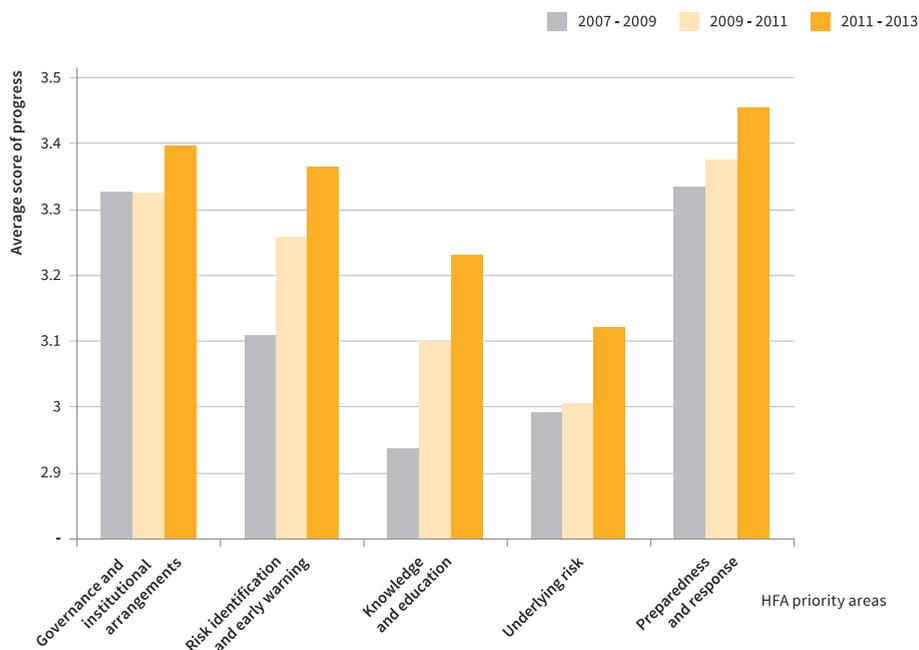
**Box 14.1** Regional, national and local self-assessments of progress against the Hyogo Framework for Action

Since 2007, national governments have been assessing their progress against the five priorities of the Hyogo Framework for Action (HFA) in a systematic manner, through the HFA Review process and HFA Monitor. In 2009, a regional self-assessment process was established for interested inter-governmental organisations and in 2011, local governments began to use a similar process and tool to review progress at the provincial, district and municipal levels.

The HFA Review process is entirely voluntary. The self-assessment process is led and owned by inter-governmental organizations, and governments and local government institutions at regional, national and local levels, respectively. It is designed to promote a multi-stakeholder appraisal progress in implementing the HFA. It is intended to stimulate an inter-disciplinary planning process that ensures that disaster risk is appropriately considered in public and private investment portfolios, not least to reduce mortality, minimise fiscal exposure and losses, and contribute to sustainable development.

The corresponding HFA Monitor is a multi-tier online tool, facilitated by UNISDR and led by country governments.<sup>ii</sup> The tool provides a mechanism to capture responses against progress indicators of the HFA, ensuring some degree of comparability of data over time series and between countries. Achievements in each core indicator are rated by governments themselves on a scale of 1 to 5, with 1 representing ‘minor’ achievement and 5 indicating ‘comprehensive’ achievement. Figure 14.1 gives an overview of progress reported against each priority area from 2007–2013.

**Figure 14.1** Progress against the five HFA priority areas, 2007–2013 (comprising three reporting cycles)

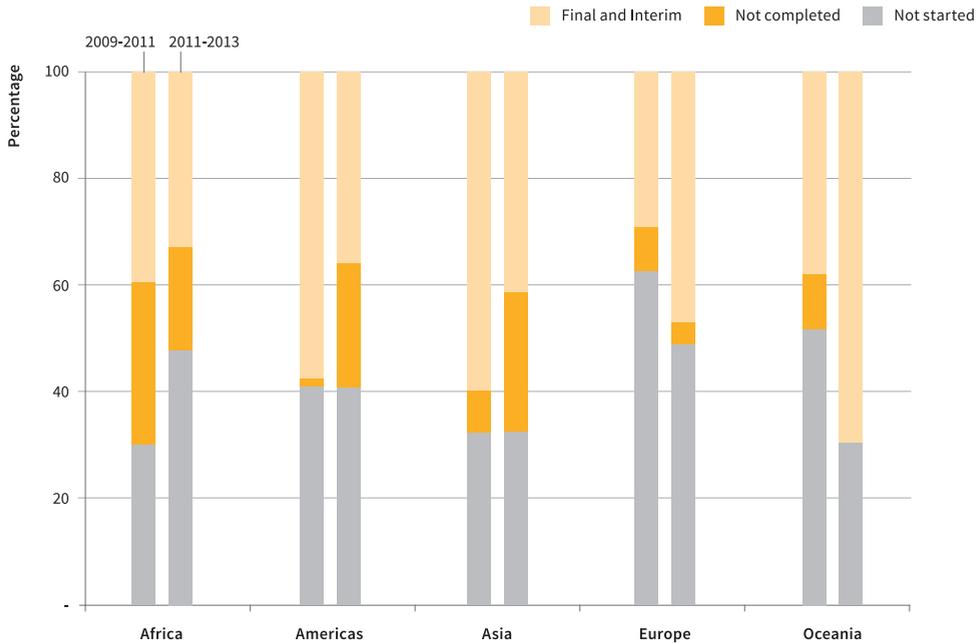


(Source: UNISDR, based on HFA Monitor data)

More than 100 countries and territories used the HFA Monitor in 2007–2009 and 109 submitted final reports in the 2009–2011 review. It should be underlined that strict comparisons across time periods are difficult, as not all countries participate in every reporting cycle. Only 45 percent of countries participating in the 2011–2013 reporting cycle have participated in all three progress reviews to date. At the time of writing, 94 national authorities have submitted reports covering June 2011 to January 2013, with a further 37 undergoing further assessments due to be published in mid-2013<sup>iii</sup>. Encouragingly, since the last reporting cycle the geographical balance of engaged countries has improved.



**Figure 14.2** Breakdown of percentage of countries reporting by region<sup>iv</sup>



(Source: UNISDR, based on HFA Monitor data)

Unless cited otherwise, all country-specific information in this chapter is based on the quantitative and qualitative analysis of the final or interim national HFA progress reports that countries have voluntarily submitted in the 2011–2013 cycle (as of March 2013). A more in-depth analysis is available in Annex 3 of the online version of this report and all national reports are available on Preventionweb.

(Source: UNISDR)

tions, these institutional and legislative systems have remained focused on disaster preparedness and response, including through improved planning, training and capacity building. This has contributed to declining mortality risk in many countries, at least in weather-related disasters (UNISDR, 2007; UNISDR, 2009; UNISDR, 2011).

Several countries have progressed in passing legislation and policy that attempts to integrate disaster risk considerations into sector strategies and wider planning. For example, a policy framework for reducing disaster risk has been incorporated in the National Development Plan 2011–2013 of the State of Palestine and integrated in the sectoral plans and strategies of the agriculture, health and security sectors. Some countries also highlight the success

of integrating disaster risk reduction into broader frameworks; examples include Burkina Faso in its Strategy for Accelerated Growth and Development; Ethiopia and its Growth and Transformation Plan; Rwanda in its Vision 2020; and Bangladesh in its Perspective Plan 2012–2021, which ties together all investment plans for the Government of Bangladesh.

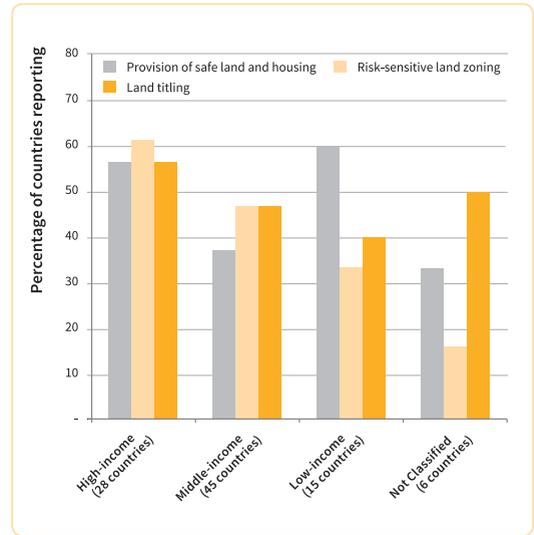
Countries have been less successful, however, in making substantial inroads to achieving risk-sensitive investment. Papua New Guinea cites the existing Disaster Management Act and Disaster Management Plans as providing legislative and regulatory provisions for disaster management in the country, but recognises that these need updating to reflect a shift in government policy from emergency re-

sponse to integrating disaster risk. Lesotho notes that the sectoral legal framework needs further strengthening and greater emphasis required to promote implementation of decentralized disaster risk reduction (DRR) activities.

Captured under HFA priority area 4, countries continue to make less progress across all three HFA reporting cycles since 2007 and the figures are sobering: of the countries that reported, only half confirm having in place simple regulatory mechanisms for providing safe land and housing for low-income communities, for risk-sensitive land zoning and private real estate development, or for land titling (Figure 14.3). From that perspective national policies, institutional frameworks and legislation on disaster risk management have been largely peripheral in addressing the underlying risk drivers, through which disaster risks accumulate.

In many countries, legislation that mandates risk-sensitive investment and development is in place and budget allocations for disaster risk manage-

**Figure 14.3** Number of countries reporting on regulatory mechanisms for risk-sensitive land use



(Source: UNISDR, based on HFA Monitor data 2011–2013)

ment have increased. However, the HFA Progress Reports of 2011–2013 highlight the continued challenge of implementing these policies, strategies and laws. As highlighted by previous

**Box 14.2** Implementation gaps

China reports that, although it has a relatively coherent disaster prevention and reduction law and regulation system, it struggles with implementing risk reduction efficiently and even of integrating its response mechanisms.

India, owing to its federal state system, struggles with lack of synergy and complementarity of national and state policies and institutional structures. Relatively new state and district disaster management agencies may have limited capacity and lack authority vis-à-vis better-established national institutions.

Germany faces similar challenges with strong federal states (or Länder) whose disaster management strategies are rarely coordinated with each other or with the national system.

Niue reports that, although limited capacities in each sector can result in implementation problems, the key issue is lack of ownership for cross-sector coordination and local implementation.

Uruguay strengthened the risk management capabilities of municipalities, while recognising that decentralized management requires commitment and installed capacities at local and departmental levels.

Myanmar established an action plan on disaster risk reduction for 2009–2015, but will have difficulties enforcing it without policy guidance or directives for townships and villages, where gaps already exist.

Pakistan cites a dependency syndrome of local institutions and communities on provincial and federal governments in managing local disasters.

Enforcement on the ground and accountability at all levels tend to be weak, confirming once again findings from the 2011 Global Assessment Report.

(Source: UNISDR)

HFA reporting cycles (UNISDR, 2009; UNISDR, 2011), problems of articulation and coordination exist between disaster risk management agencies, sector ministries and departments and local governments, compounded by lack of political muscle and technical capacities. As Box 14.2 highlights, there has been a major gap between development of policy and institutional frameworks and implementation on the ground (GNDR, 2011).

## 14.2 Attracting investment, constructing risk

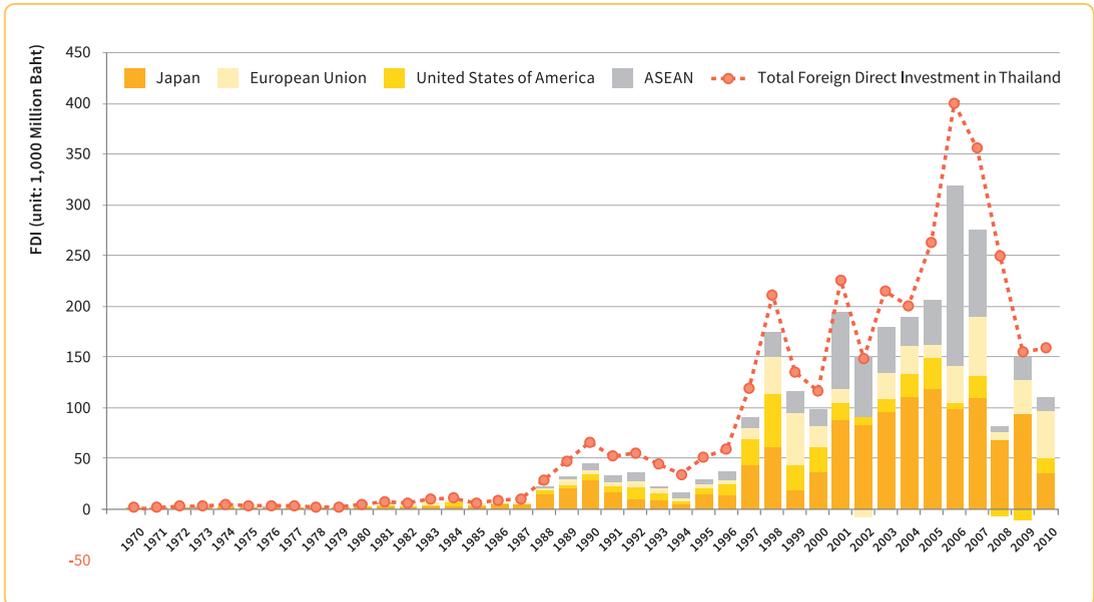
**As governments need to attract domestic and foreign direct investment (FDI), the effective management of disaster risk can be compromised. This may be mainly a result of the current disconnect between investment promotion and risk management functions within their administrations.**

Governments report difficulty in regulating investment and development in a way that reduces disaster risk; this should be examined more broadly.

Economic globalisation has been accompanied by radical changes in the role of the state in many countries. To maintain competitiveness and reduce financial risk, in some countries, welfare services and national industries have been privatised and state regulation has been reduced (Hobsbawm, 2011; Loko et al., 2003; Rondinelli and Cheema, 2003). Although this trend was briefly reverted at the outset of the global crisis in 2007 and 2008, pressure to deregulate and privatise services and infrastructure management in particular has now been renewed (Gerulis-Darcy, 2012; Heise and Lierse, 2011; Lapvitsas et al., 2010).

Across many low and middle-income countries, structural adjustment programmes, and more recently, poverty reduction strategy papers (PRSPs) were used as vehicles to remove barriers to investment and growth; to reduce government spending; and to ensure debt servicing (Dollar and Svensson, 2000; Easterly, 2003; Craig and Porter, 2003). Consequently, state-owned enterprises were privatised and private investment and participation was encouraged in sectors such as health, education, pensions, banking, ports, airports and telecommunica-

Figure 14.4 Major sources of FDI into Thailand



(Source: Bank of Thailand, in: Thampanishvong, 2012)

tions, which were previously subject to state monopolies (Kyryli and Martin, 2010; Babb, 2005; Bouton and Sumlinski, 2000; Epstein et al., 2003). This shift in fiscal and economic policy has also characterised many high-income countries, in Europe and elsewhere (Gerulis-Darcy, 2012; Lapvitsas et al., 2010; Elkins et al., 2006; Maarse, 2010; OECD, 2008).

In parallel, governments began to play an active and explicit role as promoter and facilitator of private investment. Financial, property, labour and other markets were deregulated and liberalised; tariffs on trade were reduced or eliminated; and incentives

were provided for foreign investment. At the same time, in some countries, national mechanisms and institutions for development planning were either weakened or wound down (UNCTAD, 2012; Cernea, 2005; Likosky, 2009).

As a result, the global economy is increasingly characterised by geographical competition between countries and cities to attract investment on the basis of their real or perceived comparative advantages.

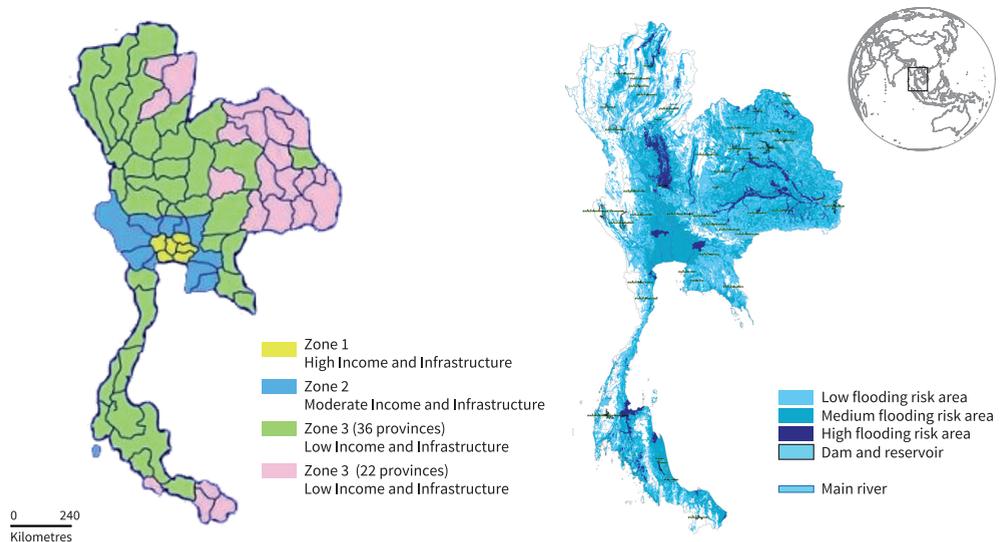
As described earlier in this report, SIDS compete to attract tourism investment; other countries with sig-

**Box 14.3** Attracting new risk in Thailand

Thailand's powerful Board of Investment (BOI) encouraged investment in three promotional zones<sup>vii</sup>—through tax privileges; sectoral incentives through BOI-identified priority projects; and privileges provided by the Industrial Authority of Thailand (IEAT). Although privileges offered in Zone 1, the areas surrounding Bangkok, were lower than those offered in regions further inland, they were still substantial, including corporate tax exemption for 3 years and a 50 percent reduction on import duty for machinery (BOI, Government of Thailand, in: Thampishvong, 2012).

Although this policy was successful in attracting FDI, it led to massive increases in flood exposure. As Figure 14.5 shows, much of the investment took place in former rice paddies located in floodplains of the provinces Ayutthaya and Pathumthani (Thampishvong, 2012), which paved the way for the 2011 Chao Phraya flood disaster (Marome, 2012).

**Figure 14.5** Thailand map of investment zones and flood risk



(Source: BOI, Government of Thailand (<http://thailandboi.com/investment-zones.html>) and Emerald Insight.<sup>viii</sup>)

(Source: UNISDR)

nificant reserves of natural capital offer broad concessions for investment in primary production, including mining, oil and gas, timber and more recently agricultural production. Yet others provide incentives for export-oriented special economic zones (SEZs) or similar mechanisms to allow the assembly and export of products with imported components (World Bank, 1998). SEZs, which aim to promote FDI, have expanded rapidly over 20 years—from 176 zones in 47 countries in 1986 to 3,500 zones in 130 countries in 2006 (Boyenge, 2007).

As inter-country and intra-country competition for increasingly footloose investment has increased, many governments now have a competitiveness agenda in which they seek to strengthen their comparative advantages in one or more sectors. The World Economic Forum classifies several basic requirements for competitiveness, which includes institutional environment, sound infrastructure, macroeconomic stability and health and primary education; efficiency enhancers, which include higher education and training, goods and labour market efficiency, a developed financial market, technological readiness, market size and innova-

tion; and sophistication factors, which includes business sophistication and innovation (WEF, 2012).

High levels of disaster risk are a negative competitiveness value because they undermine these requirements and pose risks to investors. However, instead of highlighting success in managing and reducing these risks, many governments have preferred to downplay or simply ignore them, contributing to the investor risk blindness already highlighted in the previous chapter. Instead, governments, through promoting the advantages of low labour costs, access to export markets and low taxes, may instead encourage investments in high-risk areas.

Together with the ineffectiveness of public regulation of development, particularly from a risk reduction perspective, highlighted in the previous section, this implies that the current practice of risk governance does not provide adequate disincentives to business investment that produces disaster risks.

In Thailand, for example, since 1977, the government began to grant tax exemptions and import duty reductions to companies investing in industrial activity

**Box 14.4** Guangzhou: producing risk over centuries of economic activity

As early as 200 AD, Indians and Romans came to the city also known as Canton, to trade, making Guangzhou China's oldest trading port. In the 18th and 19th centuries, China was already an important global manufacturing hub (Roy and Ong, 2011). Today, Guangzhou and its surrounding industrial areas are a major manufacturing and export hub and a global supplier of goods.

However, it also ranks just behind Miami and much ahead of Shanghai, Mumbai, Tokyo, Hong Kong and Bangkok in a recent global index of port cities' exposure of population to flooding (Nicholls et al., 2008). Moreover, it comes second in terms of assets exposed to flood risks projected for 2070 (Ibid.). In May 2010, extreme rains killed at least 86 people in Guangzhou and disrupted the lives of 8 million. The most damaging storm in 30 years, which cost Guangzhou US\$85 million, challenged the city's flood-control drainage systems and damaged 256,800 acres of farmland (Bloomberg, 2012).

Yet, despite these apparent risks, investors and their advisors do not rank them on par with other investment considerations such as corporate tax breaks, labour laws and costs and other direct business costs. Recent risk analyses of Guangzhou and Guangdong provinces do not refer to disaster risk other than the possibility that companies could be held responsible by government or communities for environmental impacts or disasters.

Instead, there are broad incentives for increased investment in flood-prone areas. The government offers 100 percent corporate tax relief for the first three years of an investment earning returns. As a result, in 2005, assets worth US\$84 billion and almost 3 million people were at risk; and these figures are estimated to increase to US\$3.4 trillion of assets and more than 10 million inhabitants by 2070 (Bloomberg, 2012).

(Source: UNISDR)

Only six years after the occurrence of a category 5 cyclone in 1999, the Government of Orissa designated the coastal district of Jagatsinghpur to be the site for the largest FDI project in the history of India: a deal was signed with a South Korean company for the development of a major steel plant, mines, railway links and a captive port to exploit the state's rich iron ore and coal deposits. The Memorandum of Understanding provided investors with a 100 percent tax exemption for five years—part of a recent initiative to further boost FDI inflows.

Without a clear risk-sharing framework in place, the Government of Orissa was potentially taking on unlimited liabilities for future disaster losses. In addition to the social and environmental costs associated with the relocation of existing communities, the clearing of forests and farmlands and the loss of livelihoods for landless and fishing communities, the project would increase hazard exposure and probably act as a magnet for further risk-increasing development in the area.

The controversial project has ignited protests from communities, the National Human Rights Commission and environmental agencies, forcing several reviews to be undertaken, most recently, in August 2012 by the Ministry of Environment and Forests. The review resulted in environmental clearance for the project to be temporarily suspended; but the project remains a priority for both state and federal governments.

(Source: Patra, 2012)

in the country. As Figure 14.4 shows, this led to a significant increase of FDI flows starting in the mid-1980s (Brimble, 2002), particularly from Japan.

But as Box 14.3 shows, success in attracting this investment led to a rapid increase in exposure of economic assets in flood-prone regions of the country (Thampanishvong, 2012).

In Guangzhou, China, public incentives to attract investment have also contributed to increasing hazard exposure and disaster risks (Box 14.4).

On the western coast of India, in Jagatsinghpur District, more than 8,000 lives were lost and 230,000 homes destroyed during the 1999 Orissa Super Cyclone (Patra, 2012). Today, as Box 14.5 highlights, the district is being considered for the largest FDI project in the history of India.

In some countries, therefore, the role of governments has been contradictory to the stated objective of the HFA to achieve substantial reduction in disaster risk. This paradox reflects a broader trade-off between rapid economic growth and risk reduction, which ultimately reflects national political priorities. If perceived additional costs of disaster risk reduction have been considered a barrier to invest-

ment flows, then many governments have prioritised growth over risk reduction. In other countries where vigorous economic growth has meant that expected annual losses from disaster (AAL) represent only a small proportion of annual capital formation (GFCF), governments may calculate that they have the capacity to absorb the risks. In this case, the implementation of policies to reduce disaster risks may be postponed until growth has led to a high level of economic development.

At the same time, there is little evidence from any of the HFA progress reports since 2007 of the engagement of investment boards, trade ministries and private investors in national disaster risk governance frameworks. As a result, coordination between economic promotion and growth policies, on the one hand, and disaster risk management strategies, on the other hand, is absent.

This lack of coordination may be exacerbated by a limited capacity for assessing the costs and benefits of disaster risk reduction. For example, while 56 countries reporting through the HFA Monitor in 2013 note that costs and benefits of disaster risk and risk reduction are taken into account in the planning and operation of major development projects, only one third confirm that national science agendas and



budgets include studies on the economic costs and benefits of DRR. Just under 80 percent of countries report that they assess what impact new development investments may have on disaster risk; however, how these assessments are translated into policy and practice is rarely made explicit.

## 14.3 Increased investment in disaster risk management

**Countries do not know how much they currently invest in disaster risk management. Complexities in budgeting and accounting across sectors add to the challenge of tracking current investments, but several governments have begun to tackle this problem as well as significantly increasing investments, particularly in corrective disaster risk management.**

If countries are to realistically assess the trade-offs between disaster risk reduction and policies that promote rapid economic growth, one particular challenge is that few countries are able to quantify their investments in disaster risk reduction and hence estimate the resulting costs and benefits.

In the 2011–2013 HFA progress reviews, 90 percent of countries report that they consider disaster risk in relation to national and sector public investment. However, just 52 percent report having systems in place that allow them to do so. Further, only 36 percent reported dedicated funding to risk reduction and prevention versus response and preparedness.

However, a number of countries in both Asia (India, Indonesia, Philippines) and Latin America (Costa Rica, Guatemala, Mexico, Panama and Peru) have been involved in dedicated efforts to track and estimate their investments in disaster risk reduction.

Capturing overall annual expenditure in dedicated disaster contingency or reserve funds is relatively straightforward. However, in a fiscal environment where disaster risk reduction investments, particu-

larly in prospective risk management, are rarely classified in national budgets, and officials with fiduciary responsibilities have little familiarity with disaster risk management, the accurate portrayal of budgetary allocation and realised expenditure is particularly challenging. This is compounded when analysis is extended to local public investment.

Although identification of expenditure managed by a national disaster risk management agency may be possible, identifying expenditure by other spending units in a government, for example across sectors, is complicated, as expenditure is seldom coded as disaster risk reduction (Box 14.6). For example, a project to strengthen water management may reduce drought and flood hazard, but would probably not be coded as disaster reduction expenditure. This ‘embedded’ expenditure on disaster risk reduction may be particularly hard to identify. Even more challenging is identifying whether public investment in general, to build schools, roads and health centres, for example, has integrated disaster risk reduction considerations.

To track embedded expenditure, close coordination between the investment planning and the financial arms of national or even local government is critical. Investment plans that take disaster risk into account may not actually be translated into budget plans (Orihuela, 2012). Budgetary officials may have excellent knowledge about budgeting, but little knowledge about investment projects from planning and sectoral agencies. This contributes to difficulty in tracking embedded investment (Ibid.).

As Box 14.6 shows, countries have taken different approaches to identifying this investment.

Investment tracking can allow better identification of costs and benefits of disaster risk reduction, but as the above examples highlight, requires significant efforts and resources. From this perspective, another approach may be to embed disaster risk reduction into national asset management. The asset management approach has been adopted in some

high-income countries to reduce expenditure on public infrastructure while assuring and improving service levels. The first step is to create inventories of public assets, which can then be used for tracking investments in disaster risk reduction. This can align the interests of finance ministries with disaster risk reduction objectives. Inventories can then be used for risk assessment or to develop risk financing solutions. For example, the Mexican Government has an inventory database of buildings, roads and other public assets and data are used for estimating exposure to design risk transfer strategies (G20/OECD, 2012).

In countries where public infrastructure and services have been privatised, the adoption of an asset management approach to disaster risk reduction investment tracking is challenging. However, in the United States of America, the national asset data-

base maintained by the Department of Homeland Security (DHS), which contains information on more than 77,000 assets—including national critical infrastructures, including dams and nuclear power plants (Moteff, 2007)—takes into account the 85 per cent operated by the private sector.

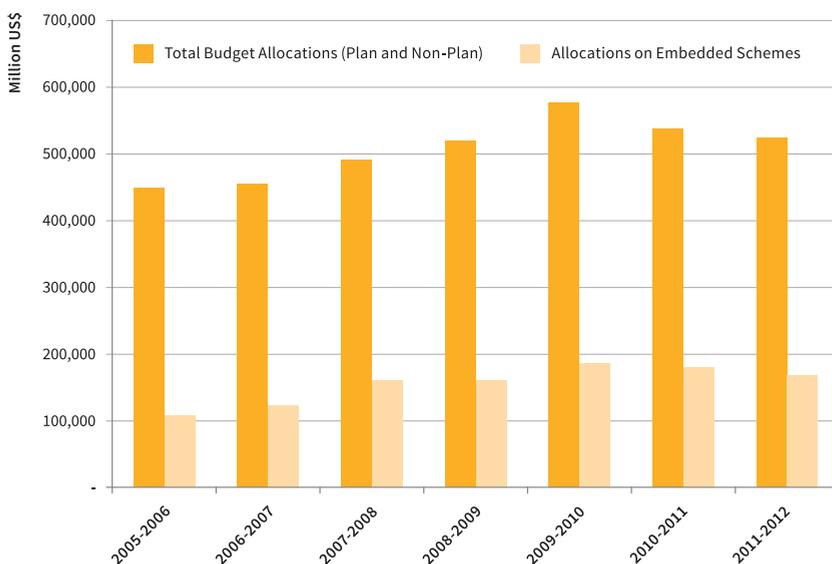
Widely varying interpretations of terminology also make inter-country comparison difficult (Gordon, 2013). This makes it complicated to clearly differentiate between expenditure on disaster response and expenditure on different kinds of risk reduction.

Despite these difficulties and the consistent message by countries regarding the limited resources available over the long term to make the required investments, there is anecdotal evidence, both from reviews of budget allocations as well as from the HFA Monitor, which highlights that overall expendi-

**Box 14.6** Tracking investment in disaster risk reduction

In India, although the allocation to Dedicated Schemes on Disaster Management remained stable from 2005–2006 to 2011–2012 (from US\$5.09 billion in 2005–2006 to US\$4.96 billion in 2011–2012), embedded disaster risk reduction investments has grown both in absolute terms and as a percentage of total budget (Dhar Chakrabarti, 2012). Figure 14.6 shows estimated budget allocations of 85 plan and non-plan schemes identified in 35 ministries and departments as having the potential for reducing risks of disasters.<sup>ix</sup>

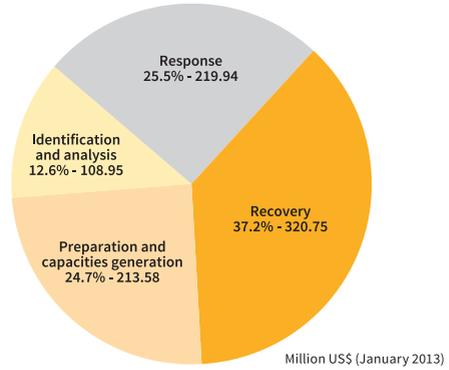
**Figure 14.6** Total budget allocation and allocations on embedded schemes in India



(Source: Dhar Chakrabarti, 2012)

In Guatemala, as Figure 14.7 below shows, the Guatemalan Ministry of Finance has developed a tool to code its expenditure in four categories: risk identification and analysis; preparation and capacity building; disaster response; and disaster recovery. None of these categories explicitly identify strategies of either corrective or prospective risk management although related activities could be embedded within these, particularly in identification and analysis, recovery and capacity building.

**Figure 14.7** Guatemala disaster risk management expenditure in 2010



(Source: Orihuela, 2012 (based on Expenditure Structure for Disaster Risk Reduction Management – Year 2010. Technical Budget Directorate (DTP), Vice Ministry of Financial Management, Ministry of Finance, Guatemala, 2012))

In Panama, the Directorate of Investment Planning (DPI) estimated government expenditures on disaster prevention, mitigation, response and reconstruction over the last decade. Using similar categories as Guatemala’s tracking system, total calculations amounted to about US\$200 million for 2000 to 2010 (Orihuela, 2012). Results revealed that expenditure on prospective risk reduction was difficult to track and unreliable, whereas dedicated expenditure on emergency response and reconstruction was easier to identify, particularly when this required a specifically documented amendment to the national annual budget (Ibid.).

In Mexico, the government, with support from the World Bank, has initiated assessment and monitoring of public investments in disaster risk reduction<sup>xi</sup> at the federal level.<sup>x</sup> The project will analyse investments; the use of hazard and risk information in federal decision-making for disaster risk reduction; and the impacts of investment through sectoral case studies. It will also develop a mechanism to follow up and better monitor future investments in disaster risk reduction<sup>xi</sup>.

(Source: UNISDR)

ture on disaster risk reduction is growing.

Some countries are now skewing their budget allocations in favour of investments in corrective disaster risk management and strengthening financial resilience (see Annex 3), often through the establishment of dedicated funds and budget lines, during post-disaster recovery or when faced with imminent events.

For example, the HFA Monitor 2011–2013 highlights that in Sri Lanka, 60 percent of the Ministry of Disaster Management’s annual allocation is dedicated to corrective disaster reduction projects. In 2012, Sweden allocated US\$60 million for disaster reduction in the transport sector. Japan’s 2012 disaster management budget is US\$46 billion, of which

US\$6.4 billion is allocated to disaster prevention management and US\$9.5 billion to national land conservation. In Australia, the National Partnership Agreement on Natural Disaster Resilience (NPA) provides state governments with approximately US\$27 million per year to invest in disaster risk reduction projects prioritised in accordance with state-wide risk assessments complementing private sector investments.

The Government of Canada allocated almost US\$100 million in its 2012 Budget to share the cost of permanent flood mitigation investments made by provinces and territories affected by spring floods in 2011. In addition, the Building Canada programme, administered by Infrastructure Canada, seeks to create a more competitive and prosperous

**Table 14.1** Disaster management budget as a percentage of Indonesia's total budget, 2006–2012 (in percent)

Benchmark	2006	2007	2008	2009	2010	2011	2012
National Budget	0.38	0.47	0.44	0.41	0.49	0.68	0.69
Central government budget	0.58	0.71	0.63	0.61	0.74	0.99	1.02
GDP*	0.08	0.09	0.09	0.07	0.08	0.12	0.12

(Source: Darwanto, 2012)

economy by investing in projects to reduce the vulnerability of communities or public infrastructure to hazards and climate change.

China has also made major investments, for example, US\$10.5 billion in flood prevention and drought relief in 2011 by the central government; US\$400 million per year for geological disaster prevention and control, with 23 provinces, 176 cities and 932 counties establishing special complementary funds amounting to an estimated US\$2 billion since 2011. Central government has also invested just under US\$600 million in agricultural disaster prevention and reduction. Its Comprehensive Disaster Prevention and Reduction Plan (2011–2015) aims to reduce direct economic losses from disasters to less than 1.5 percent of GDP.

Reviews of budget allocations also show that in the Philippines, for example, disaster risk reduction investments are trending upward, for example, from 1.4 percent to 2.1 percent of the country's national budget between 2009 and 2011 (Jose, 2012).

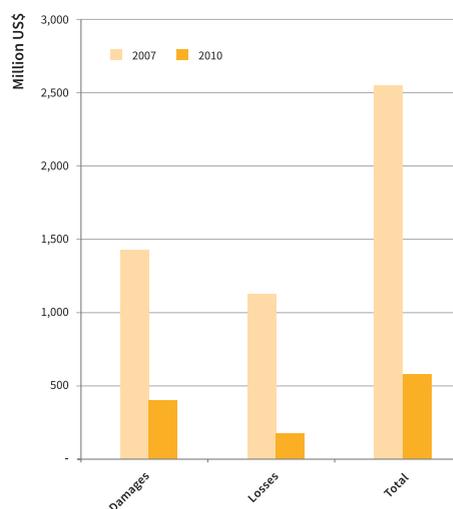
In Indonesia, disaster risk reduction allocations almost doubled from 2006 to 2012 (Table 14.1) as a proportion of the national budget. About 75 percent is allocated to (mainly corrective) disaster risk management (Darwanto, 2012).

More than half of the countries have also reported in the last two HFA review cycles that they specifically incorporate allocations to disaster risk reduction and resilient recovery into their post-disaster recovery budgets. However, only 15 percent are able to report on the percentage of this allocation.

**Box 14.7** Investments in risk reduction: the case of Tabasco, Mexico

The National Disaster Fund (FONDEN) of Mexico is currently investing between 25 percent and 30 percent of its resources to rebuilding better. These investments in risk reduction can enable significant reduction in disaster losses. The floods in the State of Tabasco in 2007 (UNISDR, 2009) caused losses equivalent to 30 percent of the state's GDP. Following the disaster, FONDEN financed a range of studies of the region's hydrology, urban development and land use, which led to the implementation of an integrated programme of investments to reduce disaster risk. The value of these investments became apparent during the state's 2010 floods. Even though rainfall levels in 2010 were comparable with levels in 2007, direct and indirect losses of 2010 were only one-fifth of those in 2007 (Figure 14.8).

**Figure 14.8** Comparing losses from floods in 2007 and 2010 in Tabasco, Mexico



(Source: FONDEN)



Indonesia, for example, after the experiences of the Yogyakarta and Central Java Earthquake of 2006, the West Sumatra Earthquake of 2009 and post Merapi Eruption of 2010, estimates that 5 percent of recovery and reconstruction funds are assigned to disaster risk reduction.<sup>xii</sup> Estimates in other countries vary considerably: Senegal estimates this at 2 percent; Bahrain, 5 percent; Anguilla, between 20 percent and 40 percent; and Colombia, 60 percent. How these funds are used is currently not well documented. But as Box 14.7 shows, investments in corrective risk management in recovery and reconstruction programmes may contribute to reductions in disaster risks.

These investments in corrective risk management are essential. Without appropriate maintenance and potentially required retrofitting, aging infrastructure becomes a risk in both high-income and low-income countries. The bridge collapse in Minnesota, United States of America, in 2007, is a well-known example that aging infrastructure causes deaths and injuries (National Transportation Safety Board, 2007). In Africa, on average, about 30 percent of countries' infrastructure assets need rehabilitation (Briceno-Garmendia et al., 2009).

However, risks to the stock of existing infrastructure puts to the test even the most risk sensitive investment planning systems. For example, though Peru is at the forefront of building disaster risk considerations into public investment planning, it reports major challenges with assessing and addressing disaster-related risks to major development projects and its stock of infrastructure. It rates itself as having made some progress, but without systematic policy and institutional commitment (progress level 2 in the HFA Monitor). Similarly, Switzerland, a country with sophisticated disaster risk management policy, legislation and practices in place, reports that a major challenge will be the retrofitting of a large stock of existing buildings that are vulnerable to earthquakes, including a number of historical buildings.

Poor coordination between capital and maintenance expenditures often occurs in countries that operate dual budgeting systems, which separate capital from current expenditure (Orihuela, 2012). Though this practice might be useful to make investment priorities clearer, investment in infrastructure needs to be appraised in terms of both capital and operating (including maintenance) costs.

## Notes

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**i** Unless cited otherwise, all data referring to national progress or challenges presented in this chapter are based on national self-assessment reports of progress against the HFA as submitted through the HFA Monitor.

**ii** <http://www.preventionweb.net/english/hyogo/hfa-monitoring/national/?pid:73&pih:2>.

**iii** As of 22 March 2013.

**iv** Geographical regions are defined according to the 'Composition of macro geographical (continental) regions' of the United Nations Statistics Division, Standard Country and Area Codes Classification.

**v** Forthcoming UNISDR summary report of national progress in implementing the HFA 2005-2013 (for publication in 2013).

**vi** Forthcoming UNISDR summary report of national progress in implementing the HFA 2005-2013 (for publication in 2013).

**vii** Government of Thailand, Board of Investment: <http://thailand-boi.com/investment-zones.html> (accessed 30-10-2012).

**viii** Data from Emerald Insight in: Community, Environment and Disaster Risk Management Journal, Vol. 8): <http://www.emeraldinsight.com/books.htm?issn=2040-7262&volume=8&chapterid=17000011&show=html>.

**ix** The disaster risk reduction allocations were calculated using embedded investment criteria developed by Dhar Chakrabarti, 2012; they are not to be considered official statistics of the Government of India.

**x** In Mexico, DRR is defined as prevention (to avoid new risks) and risk reduction (reduce existing risks).

**xi** Information directly contributed to UNISDR in support of the 2013 Global Assessment Report.

**xii** Chief of the National Agency for Disaster Management (BNPB) regulation No. 17/2011 on rehabilitation and reconstruction; the Disaster Management Plan 2010-2014 and National Action Plan for Disaster Risk Reduction 2010-2012.