

GAR

Global Assessment Report on Disaster Risk Reduction

2013

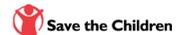
The Pocket GAR 2013

From Shared Risk to Shared Value:
The Business Case for Disaster Risk Reduction



United Nations

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Thailand floods



The Earth Icon: Links the user to a dynamic 3D globe, enabling geospatial data relevant to the subject in the text.

Droughts



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Extensive disasters



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Design and layout: AXIS and ELP, Tokyo, Japan

Printing: Imprimerie Nouvelle Gonnet, Belley, France

This paper contains 60% post-consumer recycled fibre and 40% FSC certified virgin fibre sourced from well managed forests.

Summary

In future, trillions of dollars of new business investment will pour into hazard-exposed regions, largely determining the outlook for disaster risk. In most economies, only 15–30 percent of this investment is made directly by the public sector.¹ How the other 70–85 percent of investment is made, therefore, has far-reaching consequences on disaster risk accumulation and on underlying risk drivers.

Yet, the relationship between business investment practices and disaster risk is poorly understood. Building on the findings of the two previous reports (GAR09 and GAR11), the 2013 Global Assessment Report on Disaster Risk Reduction (GAR13), *‘From Shared Risk to Shared Value: The business case for disaster risk reduction’*, seeks to fill that gap. It explores why increasing disaster risks represent a growing problem for the economic and business community at different scales.

Why do disasters challenge business?

The major disasters that struck Japan and Thailand in 2011 and the United States of America in 2012 revealed how such catastrophes can impact businesses. Earthquakes, floods and storms can damage exposed and vulnerable factories, offices and other facilities and resources, interrupting and paralysing output and business processes.

But disaster risk does not stop at the factory gate. Businesses depend on infrastructure and urban systems run by utilities and the public sector. Damage to transport and energy networks, ports and airports or to neighbourhoods where employees live interrupts business and imposes additional costs. And in today’s globalised world, even

businesses in safe locations may be affected by disasters that hit suppliers and partners on the other side of the globe.

Extended insurance coverage may enable businesses to compensate for both direct loss as well as supply chain interruption. But disasters have broader, more pervasive effects on business competitiveness. When business is interrupted, skilled workers may leave, market share may be lost to competitors, relationships with key suppliers and partners may be severed and confidence and reputation may be eroded. Once business is lost, it may never come back.

Businesses, of course, come in many shapes and sizes. And different sizes are exposed to different kinds of risk. Small businesses, for example, that serve local markets are affected directly by localised extensive disasters, as associated with flooding or landslides. These businesses also depend heavily on local public infrastructure. Destruction of a bridge in a flash flood, for example, may isolate a local smallholder farm, workshop or restaurant from markets and suppliers for days. And many such businesses go bankrupt because they lack the cash flow or reserves to be resilient.

Large global corporations, at the other end of the spectrum, and owing to their diversity and scale, are largely buffered from local impacts in any particular place. However, a major intensive disaster may critically disrupt their supply chains and global operations; for example, if a major trans-shipment hub or key supplier is affected. And the recurrent impact of smaller disaster events in regions where corporations seek to establish effective clusters of suppliers and vibrant consumer markets may result in equally significant losses in the medium to long term. Medium-sized enter-



prises and national industries similarly face different kinds of disaster risk as they may be equally affected by relatively small-scale localised events and larger disasters.

Creating shared risks

Although hazards such as earthquakes, cyclones and tsunamis are natural in origin, there is nothing natural about the way disaster risk has become embedded in the contemporary business landscape. Decades of businesses decentralising and outsourcing production to facilities located in areas with comparative advantages, such as low labour costs and easy access to export markets, has been critical to enhancing competitiveness and productivity. However, because many of these areas are hazard prone, this trend has dramatically increased the exposure of businesses and their supply chains to devastating hazards.

Investors have paid insufficient attention to this growing hazard exposure and its threat to business resilience, competitiveness and sustainability. Country briefings, analysts' reports, competitiveness indices and business forecasts rarely mention disaster risk, even in high-risk regions. Cities and countries, competing to attract investment, have generally downplayed the risks, in some cases even offering incentives to businesses to locate in hazard-exposed areas. And the pricing of risk in insurance markets has yet to act as an effective disincentive to investment in hazard-exposed areas.

In other words, economic globalisation has enabled critical gains in business productivity and efficiency, but those gains have been at the expense of an over-accumulation of disaster risk in

many business sectors and in the global economy as a whole.

Many of these risks and costs are externalised and transferred to governments, to society at large and to future generations. As GAR09 highlighted, disasters disproportionately affect lower-income countries, communities and households, and those who benefit least from wealth creation owing to economic globalisation.

However, from the perspective of shared value, this process of risk transfer is far from external to business. Losses to public infrastructure and services, to the workforce and to ecosystems also ultimately threaten the sustainability of all businesses – large and small – and thus in the medium to long term, become a shared risk.

The business case for disaster risk reduction

In today's global economic and political turmoil, rapid technological change and increasing interconnectedness of global trade, financial markets and supply chains, larger businesses perceive a riskier world. For the private sector, this means an array of complex, unpredictable events and sudden change in which risks can manifest swiftly and unexpectedly, with far-reaching ramifications.

Within this landscape, the reduction of disaster risks is taking on new significance and urgency for all global players. Investments in disaster risk management are increasingly being seen less as a cost and more of an opportunity to strengthen resilience, competitiveness and sustainability.

Larger businesses are investing to strengthen their capacities and strategies for risk management. Institutional investors, with a fiduciary responsibility to their shareholders to ensure prudence and sustainability, are now exploring regulatory and voluntary actions to increase the visibility of all risks, including those associated with disasters and climate change.

More important, if business becomes more risk-sensitive, governments will be encouraged to invest more heavily in disaster risk reduction. Effective disaster risk management will become a basic requirement for competitive countries and cities that are successful in attracting business investment.

Growing convergence of public and private initiatives to model and estimate disaster risks is beginning to underpin these efforts. Disaster risk management platforms and applications are now being developed to allow businesses to incorporate these data into their investment decisions. Accurate risk data, in turn, facilitate the development of insurance markets, with appropriate pricing that encourages risk-sensitive investment.

But above all, businesses now begin to perceive investments in disaster risk management as a compelling proposition to create shared value. Investments in climate change mitigation, sustainable water management and green cities directly address these underlying drivers and at the same time become increasingly important in value creation for businesses of all types.

Businesses are finding huge opportunities in disaster proofing new and existing infrastructure, buildings and supply chains, which are also critical to risk reduction and global sustainability. In-

vesting to reduce the vulnerability and strengthen the resilience of smaller businesses that are suppliers and partners of larger businesses not only strengthens the latter's business sustainability but also generates shared value in securing local employment, increased productivity, tax revenue and welfare.

Disaster risk reduction, therefore, is a compelling shared value proposition for business. This component needs to be recognised in the formulation of the revised international frameworks for development and disaster risk reduction that will be adopted in 2015.² It is also pertinent for future international negotiations around the challenge of climate change, if the world is to achieve a socially inclusive, low-carbon and resilient economy as laid out by the Secretary-General of the United Nations.³

GAR13 was produced in collaboration with a large number of partners. Financial resources were contributed generously by the European Commission, the Governments of Australia, Japan, Norway, and the United States of America. Other countries and organisations coordinated, developed and supported research, studies, workshops and peer reviews.





Main findings

RISKY BUSINESS

Great East Japan Earthquake



Disasters have growing impact on business

Recent major disasters such as the 2011 Great East Japan Earthquake and Chao Phraya river floods in Thailand have focused attention on the growing impact of disasters on the private sector. Businesses suffer direct losses when they have invested in locating factories, offices, plants, warehouses and other facilities in locations exposed to hazards such as floods, cyclones, earthquakes or tsunamis and without adequate investments to reduce risks. And they experience indirect losses, as production, distribution and supply chains are interrupted; consequently, production, output and throughput are reduced.

Globalised supply chains create new vulnerabilities

As supply chains become globalised, the interrup-

tion of one critical node or link produces regional and global ripples throughout the network. For example, as a consequence of damage to a maker of microchips for the automobile industry in Japan, 150,000 fewer Toyota automobiles were manufactured in the United States of America.⁴

Business loses its lifelines when disasters damage public infrastructure

Even when businesses do not experience direct losses, they depend on publicly managed or regulated roads and transportation lines, energy and water networks as well as on a workforce that in turn depends on housing, education and health facilities. A survey of 1,200 businesses in the Americas highlighted that three of the top four hazard-related business disruptions were related to disruptions in power, telecommunications and water utilities.⁵

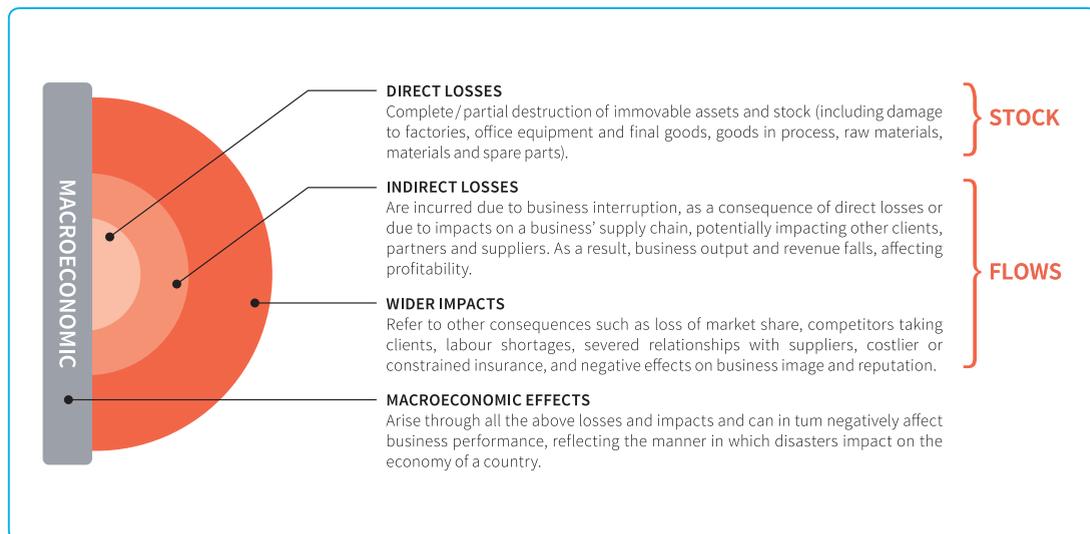
Thailand floods



Small and medium enterprises are particularly at risk

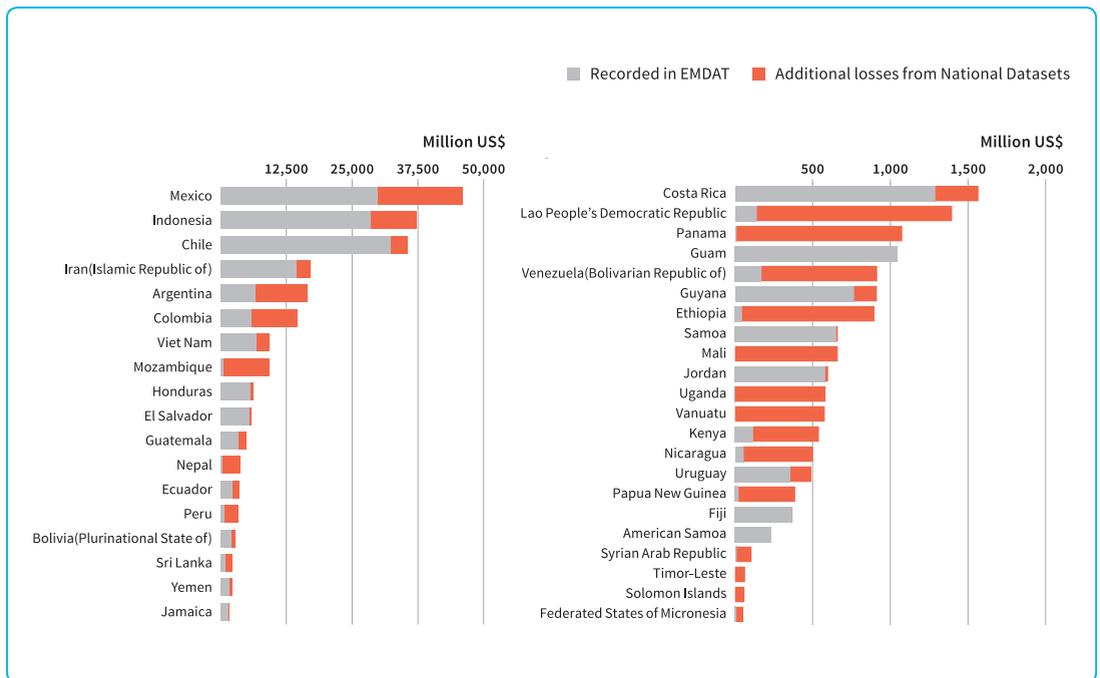
Large global businesses may be more resilient to disasters owing to diversified facilities, operations spread over many countries and regions and good

Figure 1 How businesses are affected by disasters



(Source: UNISDR, adapted from PwC)

Figure 2 Direct economic losses in 40 countries as estimated from national and global loss databases, 1981–2011 (in million US\$)⁷



(Source: UNISDR, based on DesInventar⁸)

insurance coverage. In contrast, informal sector producers and small and medium enterprises are more likely to be located in hazardous areas and less likely to have invested in protective risk-reducing schemes. A single disaster may wipe out all or a large part of these businesses' capital; and only a small percentage have insurance coverage.

Disasters undermine longer-term competitiveness and sustainability

Some businesses never recover from disaster. The wider impacts can linger for years, undermining longer-term competitiveness and sustainability. Market share may be lost as clients transfer their business to competitors; skilled workers move or find other jobs; relationships with suppliers and retailers are severed; and business image and reputation may be permanently damaged. For example, before the 1995 earthquake, the port of Kobe was the world's sixth busiest. Despite a massive investment in reconstruction and efforts to improve competitiveness by 2010 it had fallen to 47th place.⁶ When business leaves, it may never return.

THE FULL SCALE OF DISASTER LOSSES

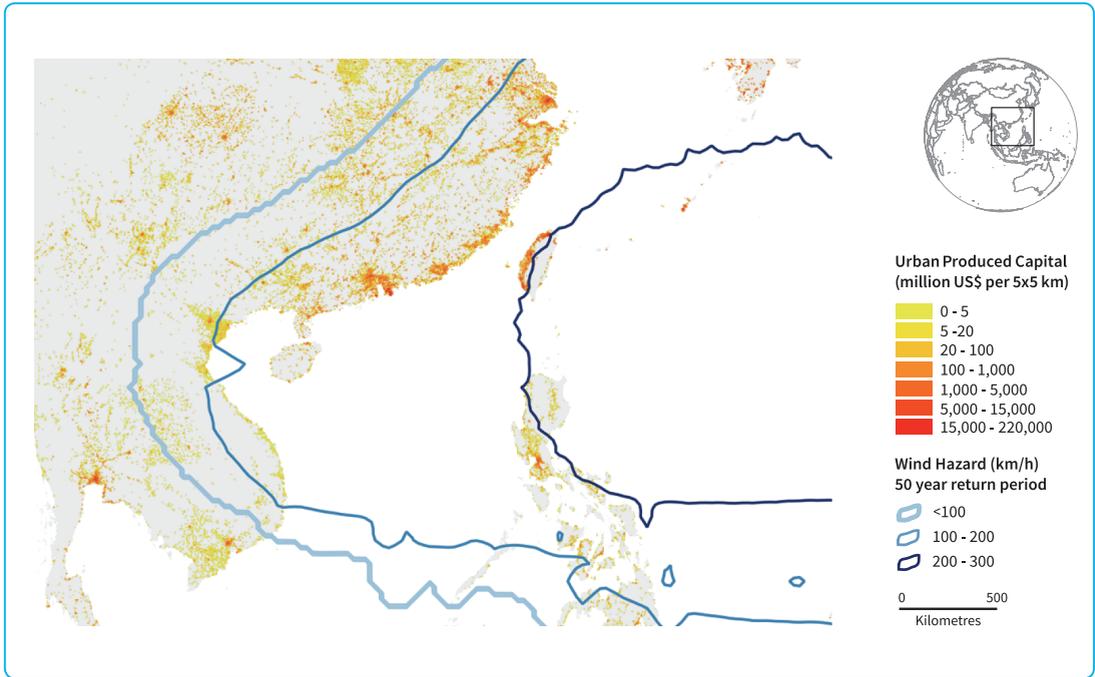
New disaster data provides a more complete picture of losses

"One trillion dollars have been lost in the last decade due to disasters and one million people killed".⁹ Such statements are familiar to investors and business developers. But they only partially reflect total disaster losses. A growing number of national disaster databases now provide access to detailed data on these losses. When combined with assessments of direct losses in major disasters as recorded by EMDAT¹⁰, these data provide a more complete picture of the real dimension of direct disaster losses. Figure 2 shows what this picture might look like in the 40 low and middle-income countries with the largest losses recorded in national disaster databases.

Direct disaster losses are at least 50 percent higher than internationally reported figures

Between 1981 and 2011, total direct losses in these countries were approximately US\$305 billion, of which internationally reported events represent

Figure 3 Produced capital stock in Southeast Asia exposed to one-in-50 year tropical cyclone wind hazard



(Source: GAR global risk model)

about 67 percent. The implication is that the headline-grabbing figures recorded in global datasets¹¹ over the last decade may be quite conservative. Once the losses associated with nationally reported smaller disasters are included, those figures are likely to be at least 50 percent higher. At the same time, these figures refer only to direct losses and thus exclude the cost of indirect losses and wider effects of disaster

THE HIDDEN RISKS OF ECONOMIC GLOBALISATION

Decentralisation and outsourcing has led to spectacular increases in produced capital

Since the last economic crisis of the mid-1970s, globalization has transformed the world beyond recognition. As spatial barriers to investment have been eroded many large businesses have decentralized, outsourced or off-shored all or part of their operations to different locations worldwide. As a result, in those low and middle-income countries that have

been successful in attracting investment there have been spectacular increases in the value of produced capital. In East Asia and the Pacific,¹² for example, this value more than doubled from US\$4.6 trillion in 1995 to US\$10 trillion in 2005 (Figure 3).

The benefits of globalisation have been accompanied by growing hazard exposure

Businesses have enhanced their productivity and profitability by taking advantage of attractive labour costs and skills, easy access to export markets, good infrastructure, a stable economic and political environment, and many other factors. However, some of the regions that have attracted this investment are hazard-exposed. In these regions, in parallel with the benefits from globalisation, the proportion of population and economic assets in tsunami and cyclone-prone coastlines, flood-prone river basins and earthquake-prone mega-cities has grown. For example, between 1970 and 2010 the proportion of global GDP exposed to tropical cyclones increased from 3.6 percent to 4.3 percent.¹³

Many low and middle-income countries lack capacities to reduce their vulnerabilities

Businesses that invest in hazard exposed low and middle-income countries may face increased disaster risk, not only as a result of increasing exposure but also because these countries have not yet developed the capacities to reduce their vulnerabilities. If businesses do not factor these vulnerabilities into their investment decisions, they may be assuming risks and liabilities that will only become apparent when hazard events occur.

INTENSIVE RISKSCAPES

Most disasters that could occur have not happened yet

Extreme hazard events, like catastrophic earthquakes or tsunamis, may only happen every five hundred or one thousand years in any given place.

As such, most of the events that could potentially occur have not happened yet. Although data on historical disaster loss provides a guide to the recent past, it is insufficient to predict and estimate the losses that may occur at present and in the future. To overcome this problem a probabilistic approach to risk modelling has been used, for example to estimate the losses that could potentially occur from a one-in-250 year earthquake (a 0.4 percent probability of occurrence in any given year) or annual average losses, which is the expected average loss per year from all the events that could potentially occur.

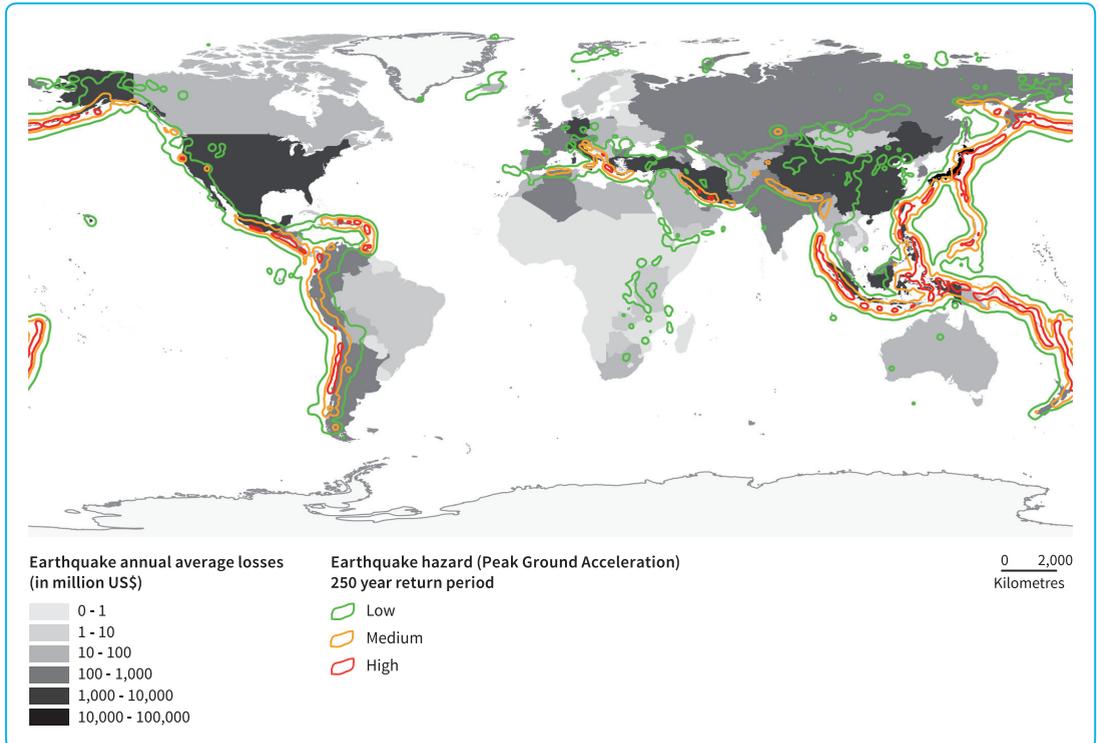
Smaller countries have the highest proportion of their capital stock at risk

Total global annual average loss for earthquakes is estimated at more than US\$100 billion and for wind damage from tropical cyclones at more than US\$80 billion. In absolute terms, most loss is concentrated in high-income countries such as Japan and the

Earthquake AAL



Figure 4 Annual average loss (AAL) from earthquakes



(Source: GAR global risk model)



United States of America, reflecting the value of their exposed capital stock. Japan alone has 15 per cent of the world's urban produced capital. However, smaller countries have a higher proportion of their capital stock at risk and in lower income countries the vulnerability of buildings also increases risk. A number of small island developing states could lose over 20 percent of their capital stock in a catastrophic one-in-250 year cyclone or earthquake.

The location of critical facilities in tsunami-exposed areas increases risk

In the case of extremely destructive one-in-500 year

tsunamis Japan has more than 15 percent of its produced capital and 12 percent of its population exposed. But other smaller countries, such as Maldives, also have very high relative exposure. Many critical facilities, including nuclear power plants and airports, are located in areas exposed to destructive tsunamis. Airport exposure is most critical in small island states, whose economies may depend on a single airport or where all airports will be affected at the same time. In French Polynesia, for example, a total of 26 airports are exposed.

Figure 5 Absolute number and proportion of infrastructure damaged in extensive disasters in 56 countries and 2 Indian states, 1970 – 2011



(Source: UNISDR, based on DesInventar)

INVISIBLE RISKS

Small disasters undermine local development as well as national competitiveness

In low and middle-income countries, accumulated losses from small-scale, highly frequent and localised disaster events approach the magnitude of those from major disasters. Such losses contribute to declines in social welfare, economic growth and ecosystems. These disasters undermine local development as well as national competitiveness. Risks in rural areas may be particularly invisible. During the 2010-2011 La Niña episode in Colombia, the proportion of affected rural populations that had over 56 percent of their basic needs unsatisfied was approximately 35 times greater than those in urban areas with less than 27 percent of their basic needs unsatisfied.¹⁴

Extensive risk is produced by urban and economic development

Badly planned and managed urban development can generate flooding, through increased run-off from a growing area of impermeable surfaces, inadequate investment in drainage and water management and the urbanisation of low-lying flood prone areas. The decline of regulatory ecosystem services, such as wetlands, aquifers, forests, floodplains and mangroves, exacerbate and magnify hazard levels. Low-income households urbanise hazard prone areas, through informal mechanisms. Cities and regions with weak governance may either lose control over the above processes or contribute to them.

Costs of extensive disasters often absorbed by less resilient households and businesses

Although extensive disasters cause only 13 percent of nationally recorded disaster mortality, they are responsible for 42 percent of direct economic loss. The costs of these extensive disasters are often absorbed directly by low-income rural and urban households, small and medium-sized enterprises (SMEs) and informal sector businesses. More than 90 percent of damage to roads, power and water supplies and telecommunications is associated with

extensive risk (Figure 5). Unless these losses are made visible and their fiscal and indirect impacts on businesses and households understood, it is difficult to justify increased public sector investments in safe and resilient infrastructure. If indirect losses to business could be measured, then the private sector may become a key advocate for increased public sector investment.

Extensive risks are rarely recorded or accounted for in national risk assessments

Hybrid loss exceedance curves now provide a way of combining and measuring the annual average loss that would be expected from all disasters, intensive and extensive. This enables countries to develop a more complete analysis of their contingent liabilities. It also lays the foundation for future risk assessments that would include indirect losses and liabilities currently absorbed – to a large extent – by individual businesses and households.

THE RESILIENCE CHALLENGE

Economic recovery and business recovery are interrelated

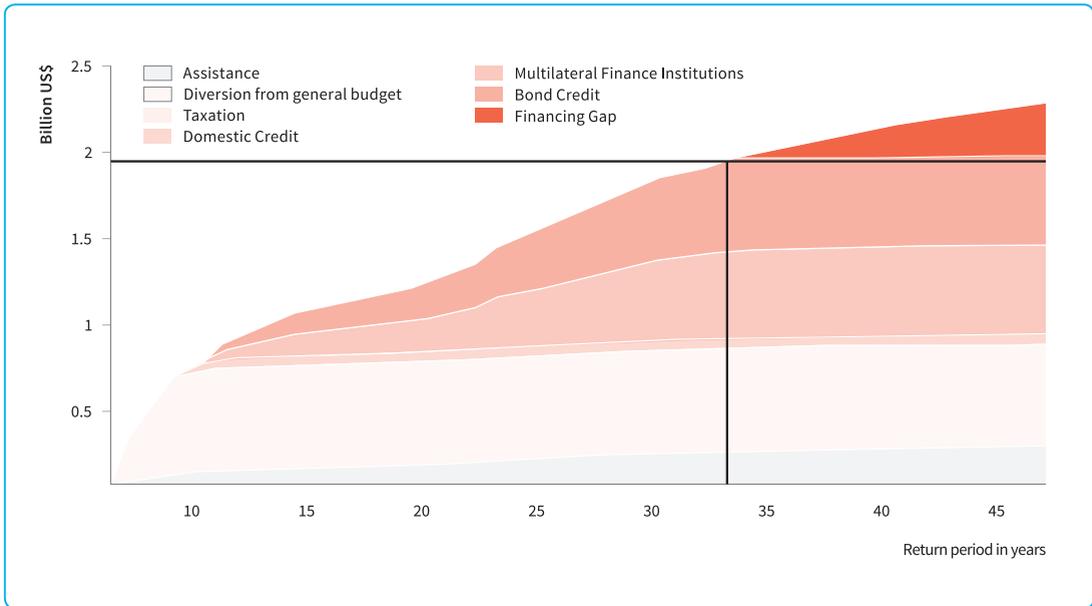
Resilience refers to the capacity to absorb losses and recover. How quickly an economy recovers and how quickly a business recovers are clearly interrelated. But businesses are more likely to recover faster in a country where governments have the capacity to invest in reconstruction or where they have risk financing measures in place that cover most contingencies.

Countries least able to afford lost investment are losing the most

When disaster losses represent a high proportion of capital formation, countries will have less capacity to replace lost capital. For example, in Mozambique, annual direct disaster losses surpassed capital formation¹⁵ three times during the period 1993–2011. In each episode, investment not only slowed down in the country but actually reversed. In 2011, these losses represented 12 percent of Mozambique's cap-



Figure 6 The risk financing gap in Honduras



(Source: Hochrainer et al., 2013¹⁶)

ital formation, in El Salvador, 8 percent; and in both Honduras and Nicaragua, about 6 percent.¹⁷ In general, countries with sluggish growth and investment will find it more difficult to replace lost capital stock. Thus, to protect economic growth, investment in disaster risk reduction is extremely important.

Many countries have a risk-financing gap

Resilience also depends on whether a government is able to finance recovery and reconstruction through budget reallocations, tax increases, reserves, domestic or external borrowing, international assistance, insurance and reinsurance payouts, and market mechanisms such as catastrophe-linked securities. Many countries face a financing gap when disaster losses exceed their fiscal capacities. For example, Honduras (Figure 6) would face a financing gap in the case of losses that could be expected from a one-in-33 year disaster or greater.

Countries may never recover the lost growth from disasters

In the medium or long term, countries that have experienced intensive disasters may never recover

the lost growth. For example, countries affected by tropical cyclones experience lower GDP growth in the 15 years that follow. In countries with frequent severe cyclones—such as Madagascar and the Philippines—and large risk-financing gaps, growth will be lower over several decades. Countries with less frequent and severe cyclones—such as India or the United States of America—also experience lower growth, but the divergence is far less.¹⁸

NATURAL CAPITAL RISKS

Natural capital risk compromises future wealth

Business investment also flows into other sectors, such as agribusiness, forestry and mining, in countries with abundant natural capital. Through mechanisms such as climate change, land degradation and the overexploitation of water resources many such investments generate shared risks and costs, not only in space but in time because exhaustion of natural capital compromises the wealth of future generations.

Wild-land fires represent a high cost to tropical ecosystem services

Largely human-induced wild-land fires affect carbon storage, support to biodiversity, protection of water sources, reduction of soil erosion and land degradation and climate regulation in tropical ecosystems. Preliminary estimates highlight that global annual losses to these ecosystem services could be as high as US\$190 billion.¹⁹

Land degradation is a key driver of agricultural drought risk

Land degradation, associated with intensive agriculture, overgrazing, salinization, deforestation and the breakdown of traditional agro-ecological systems, is a key driver of agricultural drought risk. As Figure 7 shows, large areas of Africa, the Mediterranean and the Middle East experience severe levels of both

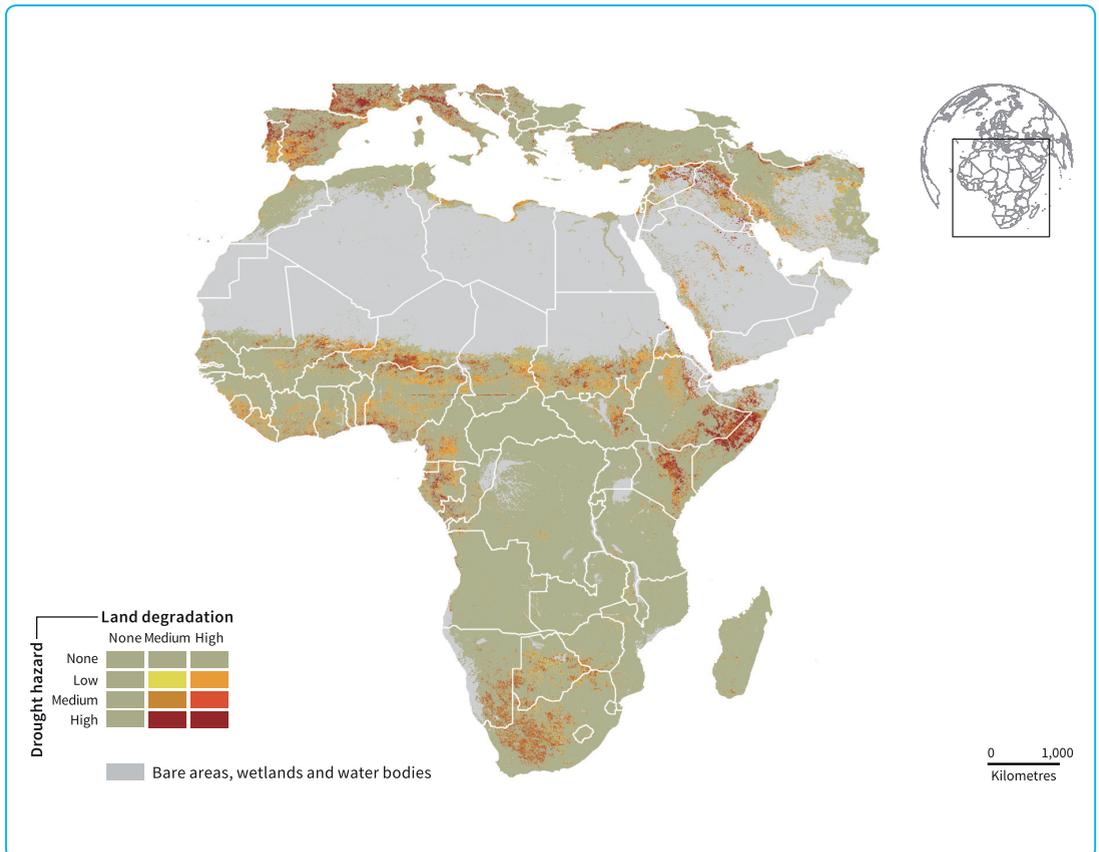
land degradation and drought. These areas are at risk of desertification, representing an irreversible loss of natural capital.

National economies at risk from agricultural drought

Probabilistic modelling is now providing a clearer picture of potential crop losses at the country level. For example, in Mozambique, agriculture contributes 25 percent of GDP.²⁰ The country risks losing, on average, 0.12 percent of its GDP every year owing to the loss of 3 percent of its total maize production to agricultural drought.²¹ A one-in-10 year drought in Mozambique would lower the maize yield by 6 percent and GDP by 0.3 percent.

Droughts

Figure 7 Agricultural drought and land degradation in Africa, the Mediterranean and Middle East



(Source: Erian et al., 2012²²)



SMALL ISLANDS, BIG OPPORTUNITIES

Small island developing states (SIDS) have the world's highest relative disaster risk

Given their small size, the expected annual average losses from earthquakes and tropical cyclone wind damage in SIDS represent respectively only 2 per cent and 1.4 percent of the global total. However, precisely because of their small size, 8 of the 10 countries in the world that would lose the largest proportion of the value of their urban produced capital in a one-in-250 year earthquake are SIDS. In the case of wind damage from a catastrophic one-in-250 year cyclone, 6 of the top 10 countries are SIDS.

Climate change will magnify disaster risk in SIDS

SIDS contribute less than 1 percent of total global carbon dioxide emissions. But climate change is likely to disproportionately magnify their disaster risk, due to sea level rise and associated flood and

storm surge hazard, increasing cyclonic wind intensity, coastal erosion, saltwater intrusion into coastal aquifers and worsening water scarcity and drought.

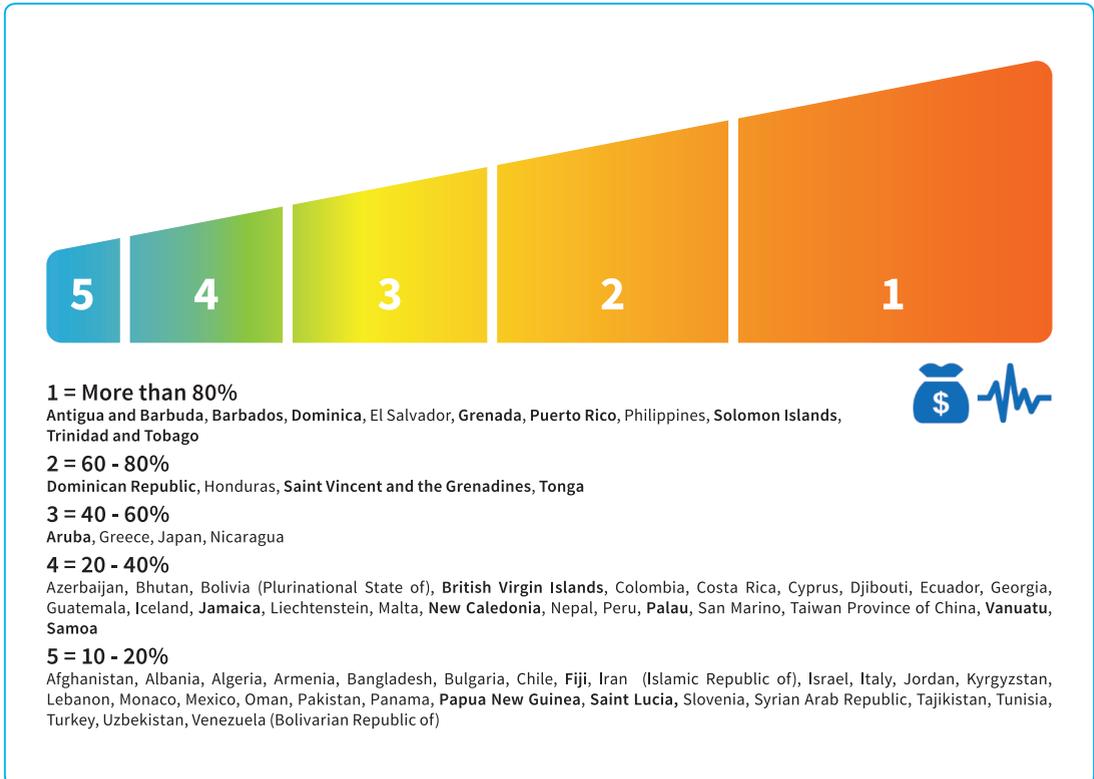
Disasters challenge the economic resilience of SIDS

Disasters are amplified in SIDS because their economies are undiversified; hazard events may affect their entire territory, and many are heavily indebted and have a constrained fiscal space. In Jamaica, for example, observed annual average losses between 1991 and 2011 were equivalent to 2.6 per cent of its annual average capital formation, contributing to sluggish growth.²³ And the expected losses from a one-in-250 year earthquake could exceed the value of 80 percent of annual capital formation in some SIDS.

Disaster risk reduction: a high traction strategy for SIDS

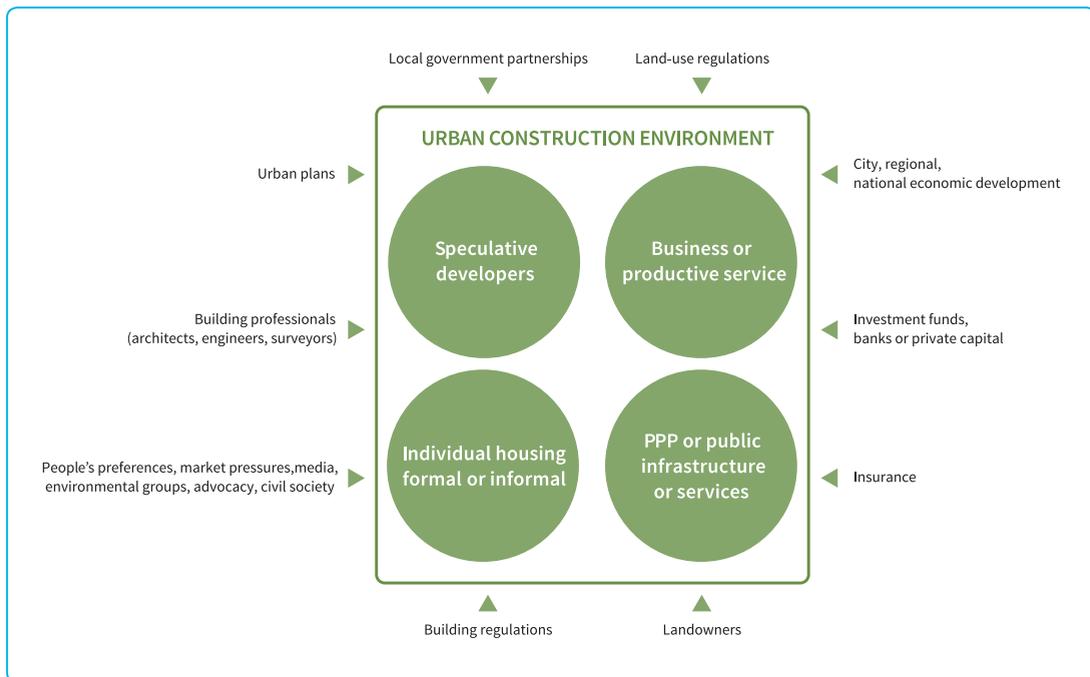
Precisely because of this combination of high risks

Figure 8 Estimated losses from one-in-250 year earthquake as a proportion of annual capital formation



(Source: GAR global risk model)

Figure 9 Who and what is influencing the production of risk in urban development



(Source: Johnson et al., 2012²⁴)

and low resilience, investments in disaster risk reduction and climate change adaptation are likely to reap greater benefits in SIDS than in any other country group. Investing in disaster risk reduction is therefore a high traction strategy for SIDS to attract investment, strengthen resilience and improve competitiveness and sustainability.

URBANISING RISK

A new wave of urbanisation is unfolding in hazard-exposed countries

The urban population of sub-Saharan Africa is expected to grow from 298 million in 2010 to 596 million in 2030 and 1,069 million in 2050.²⁵ The urban population of India is expected to grow from 379 million in 2010 to 606 million in 2030 and 875 million in 2050. This implies rapid urban growth in hazard prone countries and in regions with weak capacities to manage disaster risks. Yet, this new wave also represents a major business opportunity. One estimate projects investment in urban development to

increase by 67 percent, from US\$7.2 trillion in 2011 to US\$12 trillion by 2020.²⁶

Limited incentives in urban development sector to invest in reducing disaster risks

Business investments in urban development are influenced by a range of factors and involve different stakeholders (Figure 9). The short-term profitability of speculative urban development, weak or ineffective public regulatory frameworks, which rarely factor in disaster risk; and the absence of clear channels of responsibility and accountability for shared risks and costs generated by real estate development conspire against risk sensitive investment, even in high income countries. Since 1989, for example, 7 to 11 percent of new housing in the United Kingdom has been built in areas with 'high flood risk'.²⁷

Large infrastructure projects have a major potential to generate shared risks and costs

Investment in major infrastructure projects structures how cities and their regions grow. Even when risks to the infrastructure itself have been reduced, it



may lead to other investments in hazard prone areas that increase disaster risk. For example, more than 50 stations on a new metro line in Delhi, India, are located in areas of high earthquake hazard and one was also built in a high flood hazard area. Risks to the metro itself have been reduced due to application of risk-sensitive building codes. However, this is not necessarily the case for new real estate developments surrounding the stations.²⁸

Green urban development is a key shared value proposition

Urban governments that seek to attract investment are entering into innovative partnerships with businesses as well as with low-income communities to address climate change, improve security and effectively manage risk. And new approaches to urban development that highlight environmental and social sustainability are becoming a key value proposition for the construction and real estate sector. Green buildings attract higher rents, stronger asset values and more stable tenancies. Reducing the risks associated with flooding and other hazards fits easily into this new narrative of urban development.

HAZARDOUS LEISURE

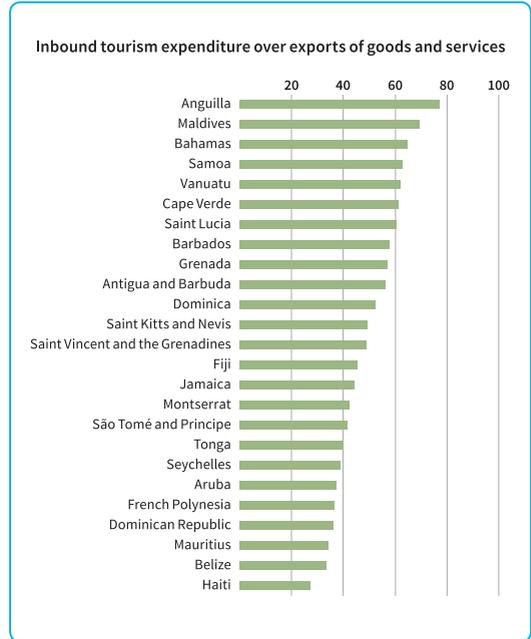
Business investment in SIDS tourism sector comes with high levels of disaster risk

Globally, tourism is one of the most dynamic and fastest-growing business sectors, contributing 9 percent to global GDP and responsible for 4.6 percent of total global capital investment.²⁹ Although SIDS may be uncompetitive in other economic sectors, in tourism, many of them excel. In 2007, international tourism receipts accounted for 51 percent of total value of exports of SIDS³⁰ (Figure 10). Given their high levels of disaster risk and the large dependency of local economies on tourism, this becomes an economic risk for these countries.

Risks from tourism investment shared with those who least benefit from the returns

As tourism development attracts further business

Figure 10 Contribution of tourism to exports of goods and services in SIDS, annual average 2006–2010 (in percent)



(Source: UNISDR, based on data from UNCTAD, 2011³¹)

investments, generates jobs and with it results in the build-up of housing development and road infrastructure, the ownership of risk is usually not well defined. For example, following the 2009 floods in Nadi, Fiji, 46 small businesses (one-fifth of all those registered with the Chamber of Commerce) had to close down because of damage to buildings or destruction of stock; only a handful eventually reopened.³²

Little disincentive to business investment in hazard-prone beachfront locations

In 2004, Hurricane Ivan resulted in estimated direct losses of US\$900 million in Grenada, more than twice the country’s GDP. The tourism sector was particularly hard hit. Of the island’s infrastructure, 70 percent was damaged, and demand for services from the tourism sector declined for several years.³³ In SIDS, however, because beach or waterfront locations represent more profitable business, investment continues to concentrate in highly hazard-exposed areas. High profitability and short turnover to recover capital investments may mean that investors over-discount the risk posed by intensive events

with long return periods. And for SIDS governments, tourism is one of the few sectors where they are competitive.

Tourism risk reduction: a triple win for investors, governments and communities

There are signs that in transparently managing disaster risks in the tourism sector, both businesses making investments and SIDS striving to attract those investments can increase their competitiveness. Certification programmes and voluntary rating systems are emerging as popular tools. They are increasingly being accepted by clients and supported by governments that seek to promote the role of private enterprises in disaster risk management.

NO FREE LUNCH: AGRIBUSINESS AND THE RISKS TO FOOD SECURITY

Risks associated with agribusiness investments shared with all who purchase food

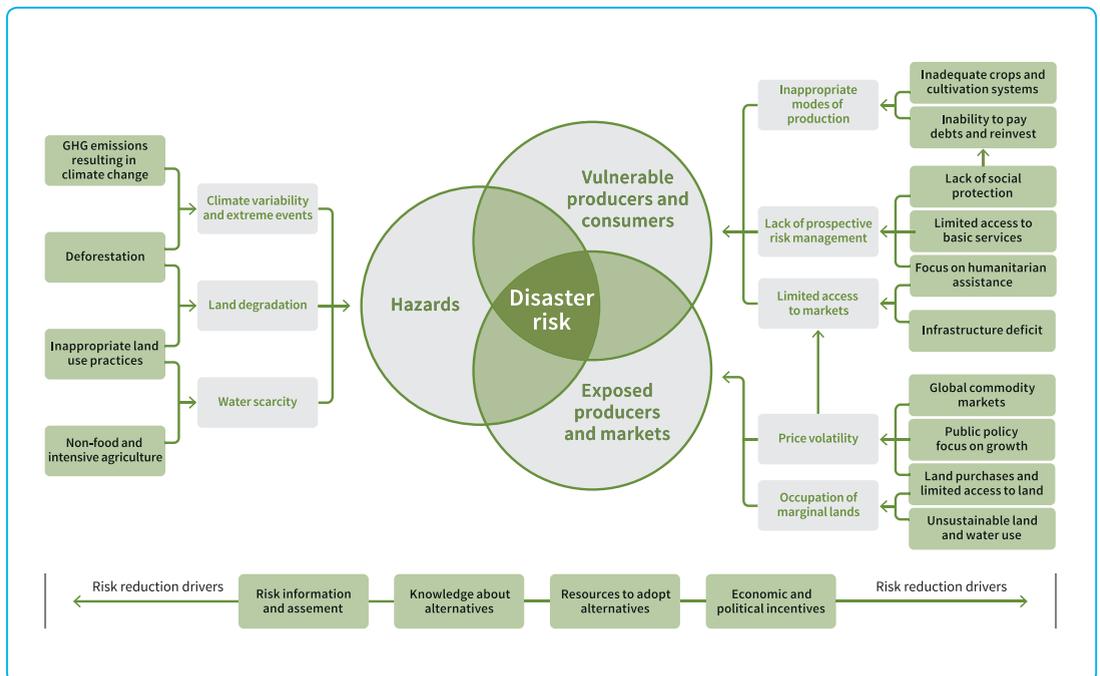
Food security depends more on how much house-

holds can buy than on how much they can grow. The FAO Food Price Index has more than doubled since 2000, driven by factors that include population growth, urbanisation and changing food consumption patterns; high crude oil prices; use of agricultural commodities for the production of bio-fuels; and lower global stocks.³⁴ Disasters in the agricultural sector, associated with droughts, floods and climate variation not only produce losses for agribusinesses, large or small. Such events in areas where production is concentrated cause production shortfalls that, magnified by commodity markets, can lead to food price spikes. These in turn affect the food security of low-income rural and urban households alike.

Food insecurity risk rises if hazards are not identified, estimated and taken into account

Stimulated by rising food prices large agribusinesses are buying productive, arable land and investing in export-oriented commercial agriculture, particularly in sub-Saharan Africa. Globally, 13 of the top 20 target countries for international investment in

Figure 11 The multiple dimensions of disaster risk in agriculture



(Source: UNISDR, adapted from Fava Neves and Alves Pinto, 2012³⁵)



agricultural land acquisitions are in Africa.³⁶ For example acquisitions of more than 2 million hectares in Madagascar and over 1 million hectares in Ethiopia have been confirmed.³⁷ Most of these countries have a high share of agricultural GDP, high levels of food insecurity and only incipient estimates of agricultural drought hazard. In a context of increasingly constrained global food markets, the spread of agribusiness investments into regions with high but poorly understood agricultural drought and other hazards, generates risks of future and more severe food price spikes. This poses a greater threat to the food security of low-income rural and urban households than drought itself.

New partnerships may strengthen resilience of smallholder farmers

Improved modelling of agricultural drought and other hazards, together with down-scaled climate

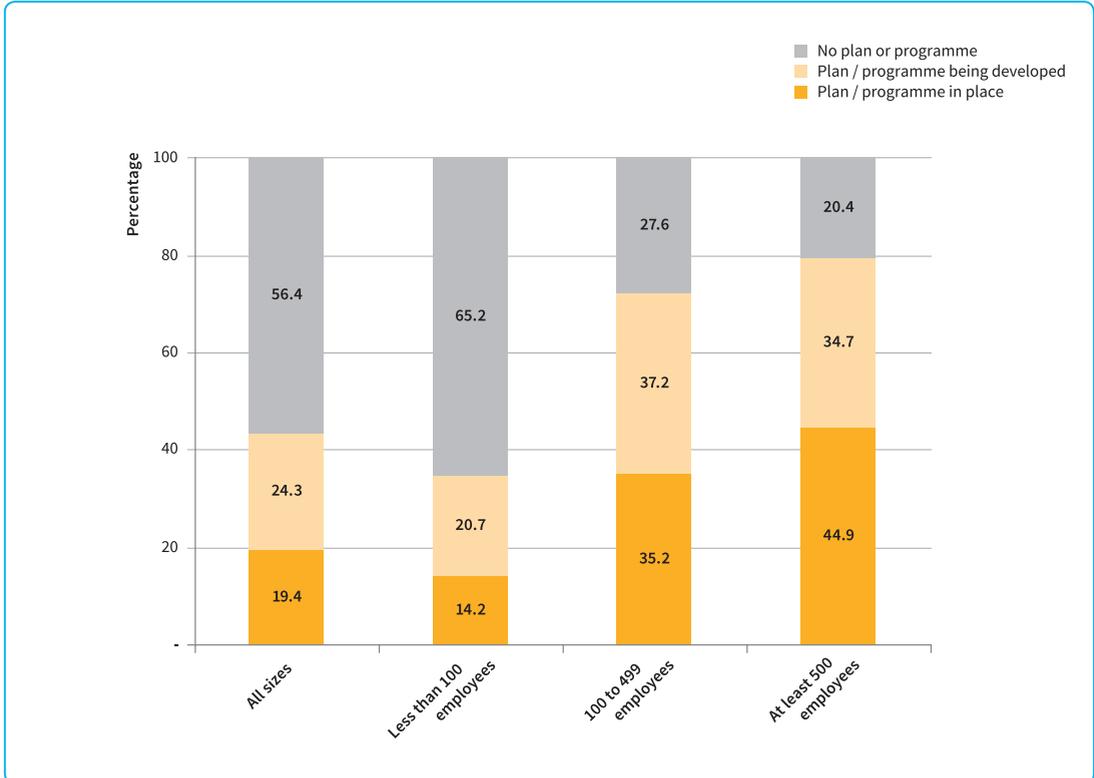
scenarios, is starting to provide an evidence base for informed investments and more relevant and effective public policy. Increasing agricultural productivity and resilience alone will not eliminate food insecurity. However, by increasing the value and quantity of crops smallholder farmers are able to sell and by reducing the risks of crop loss, income will grow, allowing farmers to purchase more food and increase reserves for lean periods.

FROM MANAGING DISASTERS TO MANAGING RISKS

Disaster risks are still not mainstream in corporate risk management

In recent years, large global businesses have become increasingly sensitive to the different risks that may affect their operations. However, the focus of corporate

Figure 12 Percentage of companies with business continuity plans or crisis management programmes (by company size) in six cities of the Americas



(Source: Sarmiento and Hoberman, 2012³⁸)

risk management is centred on financial, economic, market and legal risks. Although business surveys highlight an increasing imperative to manage risks, disaster risks are rarely considered. This practice is also reflected in curricula of many business schools.

Shift from business continuity planning to disaster risk management is still incipient

In most large global businesses, disaster risk management remains centred on business continuity planning. Shared risks are not yet fully considered and few global corporations collaborate actively with national and local governments across the countries in which they operate. SMEs are more likely to lack risk awareness or have the capacity to manage disaster risks. In a survey of companies with at least 500 employees in six disaster prone cities in the Americas, about 45 percent had a business continuity plan or crisis management programme. However, only 14.2 percent of enterprises with less than 100 employees had such a plan (Figure 12).

Corporate disaster risk management policies are evolving

Most businesses are engaging in some form of disaster risk assessment and management for their supply chains. A number of large global businesses are moving towards the setting of risk management standards, which suppliers have to comply with. In

addition, risk assessments are being demanded from small businesses that are key suppliers. However, these changes are only reflected in more recent (three-to-four year) risk management policies. Few companies have successfully combined enhanced information of potential disruptions and their financial impact with simulations of disaster events to better understand risk drivers and the geographical concentration of risk as a basis for their supply chain management.

RISK BLIND INVESTING

Securities and bonds for businesses traded with little consideration of disaster risks

Institutional investors manage assets worth more than US\$80 trillion globally.³⁹ Asset fund managers (Figure 13) rarely consider disaster risk when making investments. The growing distance between these managers and beneficiaries means that the latter are increasingly disconnected from how their investment portfolios are being managed, including how much is at risk from disasters. And because the financial market has become increasingly disjointed from the real economy, it generates an additional disconnection between asset managers and how the invested money is ultimately used. Disaster risk is further hidden in investment decisions by the in-

Figure 13 The institutional investment value chain



(Source: UNISDR, adapted from Clements-Hunt, 2012⁴⁰)



creasing sophistication, complexity and opacity of financial instruments.

Forecasts and country briefings do not encourage disaster risk sensitive investment

Business surveys, economic forecasts and country briefings that guide investors and credit ratings are based on information on quality and availability of labour, access to export markets, and political and economic stability, and incentives, such as tax breaks. Disaster risk information is not generally included, even in briefings on high-risk countries. For example, the 2012 Economist Intelligence Unit country report of Indonesia does not address disaster risk at all.⁴¹ The impacts of disasters on a country's fiscal policy, infrastructure and utilities, and overall enabling business environment are not understood. This has potentially serious consequences for business investment decisions.

Regulators and investors are demanding greater transparency in disclosing risks

Recent efforts of investor groups concerned with climate change have begun to show results. Currently,

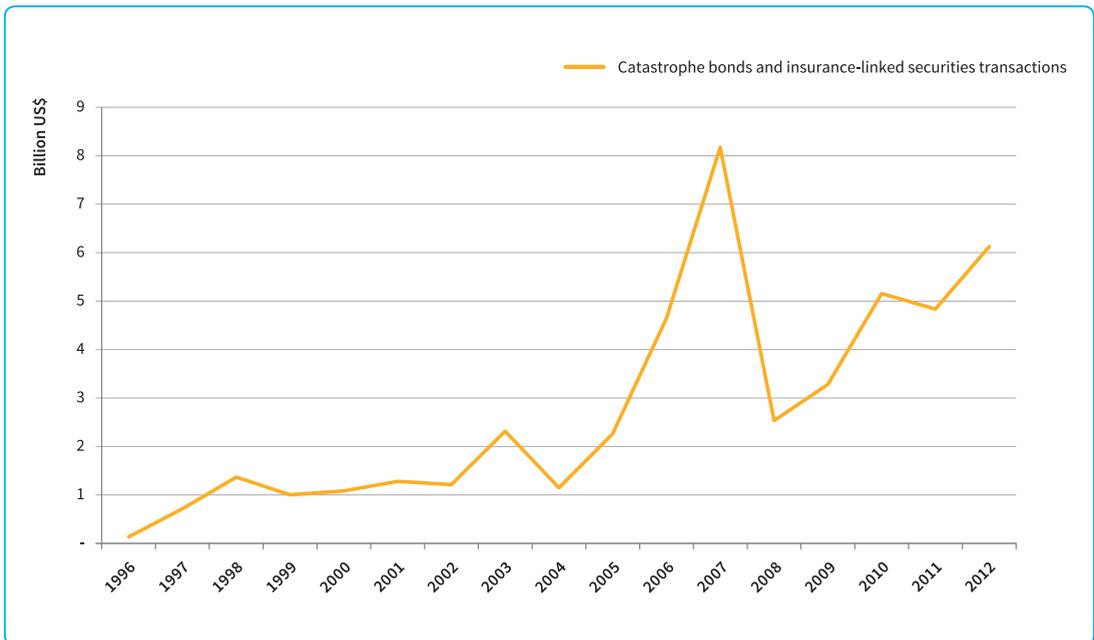
about 10 percent of global asset fund managers now integrate environmental, social and governance issues into their investment process.⁴² Regulators are also requiring that businesses disclose hidden risks. A changing approach to investment is also taking root in some large institutional investors. These changing values are now guiding both regulators concerned with reducing systemic risks as well as investors who want to protect their investments and avoid generating shared risks. The threat of falling equity prices or negative analyst ratings for businesses that do not manage or disclose their disaster risks may in time become a powerful incentive that rewards those businesses and governments, which more effectively manage those risks.

SECURING INVESTMENT: INSURANCE REVISITED

Insurance pricing and availability has major influence on business investment

Unless assets such as factories and other facilities can be insured businesses cannot obtain loans and other

Figure 14 Growth in the catastrophe bonds and insurance-linked securities market, 1996-2012



(Source: UNISDR, based on Artemis Catastrophe Bond & insurance-Linked Securities Deal Directory⁴³)

forms of finance. Expensive premiums may make the investment unattractive, forcing the business to look elsewhere. Conversely, however, when premiums are too low, businesses may be encouraged to overly discount the risks and invest in hazard-exposed areas, accumulating disaster risks for themselves and generating wider shared risks and costs.

Insurance is no substitute for sound risk-based investment decisions

Insurance does not usually fully guarantee business continuity nor protect businesses from the wider impacts of disaster. Insurance can provide protection from asset loss and even supply chain interruption, but does not compensate for wider effects such as low employee morale, increased absenteeism, stress or unrest, low productivity, declining customer demand and goodwill, and other impacts.

Insurance works best in countries with a mature risk management culture

In rapidly growing economies, particularly in Asia, insurance penetration is spreading faster than disaster risks are being reduced. This practice increases exposure of the insurance industry to high and growing losses, even if existing risks are accurately modelled. In these countries, low insurance pricing, aimed at increasing market penetration or attracting investment, may not encourage risk-averse investment. It may generate fiscal risks when premiums are not risk-based and public sector institutions with limited experience of the insurance market are involved.

Premiums often fail to realistically price risk

Insurance should act as a powerful incentive for disaster risk reduction if premiums represented the real economic value of risk. However, although risks in developed markets, such as Europe, Japan and the United States of America, are modelled with precision, this is often not the case in new and emerging insurance markets. Similarly, when insurance is subsidised by governments to increase penetration rates, premiums may be under-priced. If, in addition, governments act as insurers of last resort this

may actually provide perverse incentives in favour of investment in hazard-exposed areas. However, recent catastrophes such as the Christchurch earthquakes and Thailand floods are forcing the insurance market to reconsider how to price disaster risks and have led to insurance pricing being revised and availability constrained.⁴⁴

Insurance-linked securities increase choice but may lead to unrealistic risk pricing

Financial markets are now increasing the supply of capital to the insurance industry through insurance-linked securities and similar financial products. This increases competition and the choice of insurance products available to manage disaster risks (Figure 14). However, these advantages may be undermined if asset managers and catastrophe bond issuers favour short-term gains in bond prices rather than a realistic assessment of risk levels.

RISK GOVERNANCE: IN SEARCH OF THE MISSING PARADIGM

Risk governance arrangements have evolved significantly

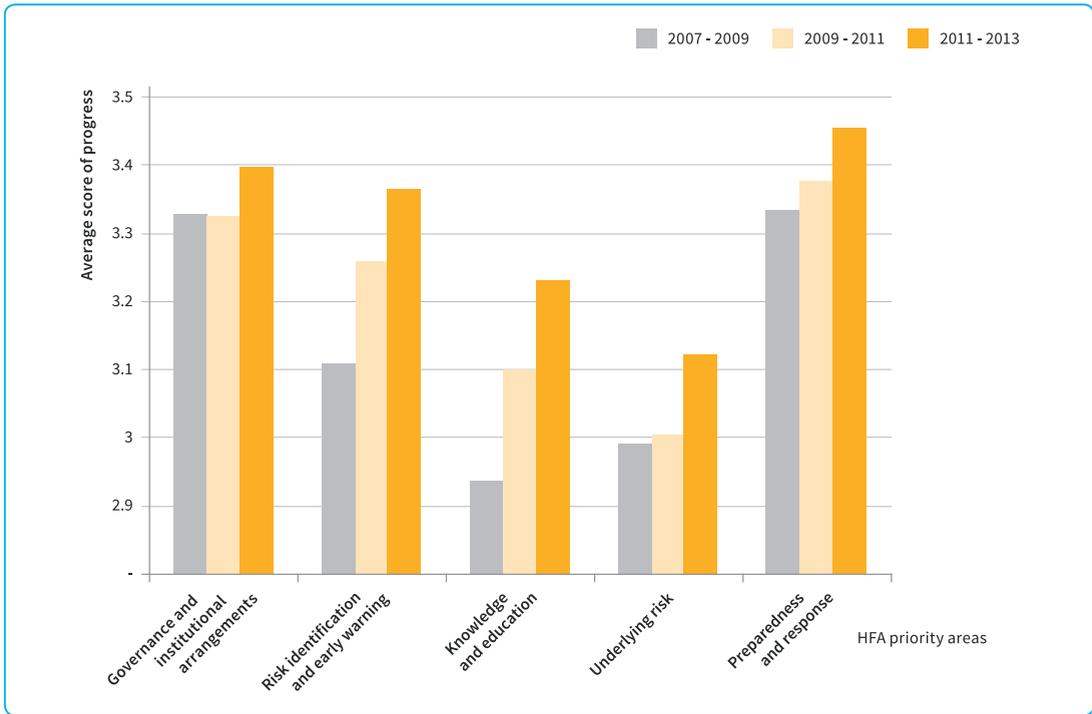
From the 1990s onward, a growing number of countries reformed their legislation, policy and institutional frameworks for disaster risk management. Multi-sector committees now provide coordination and articulation across different ministries and departments; responsibilities are decentralised to local governments and dedicated budget lines for risk reduction activities are established. As of December 2012, 85 countries had established multi-sector national platforms for disaster risk management and 121 countries enacted legislation to establish policy and legal frameworks for disaster risk reduction.⁴⁵ But with notable exceptions, these institutional and legislative systems have remained focused on disaster preparedness and response.

Institutional and legislative systems largely peripheral in addressing underlying risk

Captured under HFA priority area 4, countries have



Figure 15 Progress against the five Hyogo Framework for Action (HFA) priority areas, 2007–2013



(Source: UNISDR, based on HFA Monitor data⁴⁵)

been less successful in achieving risk-sensitive investment across all three HFA reporting cycles since 2007 (Figure 15). For example, less than 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. In many cases, legislation and policies are in place. However, there has been a major gap between development of policy and institutional frameworks and implementation on the ground.

Lack of coordination between economic growth policies and disaster risk management

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. Many governments, through promoting the advantages of low labour costs, access to export markets and low taxes, may actually encourage investments in high-risk areas. However, there is little evidence of the

engagement of investment boards, trade ministries and private investors in national disaster risk governance frameworks.

Few countries are able to quantify their investments in disaster risk reduction

If countries are to realistically assess the trade-offs between disaster risk reduction and policies that promote rapid economic growth, they need to find a convincing economic and political imperative to do so. 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. This hinders governments from being able to estimate the resulting costs and benefits of such initiatives.

Overall expenditure on disaster risk reduction seems to be growing

There is anecdotal evidence, both from reviews of

budget allocations as well as from the HFA Monitor, which highlights that some countries are now increasing their budget allocations on disaster risk reduction. This is despite consistent messages regarding the limited resources available over the long term to make required investments. At the same time, though, budget allocations are being skewed in favour of corrective disaster risk management and strengthening financial resilience. This is often done through the establishment of dedicated funds and budget lines, during post-disaster recovery or when faced with imminent events.

ANTICIPATING RISK

Progress still limited in adopting prospective disaster risk management

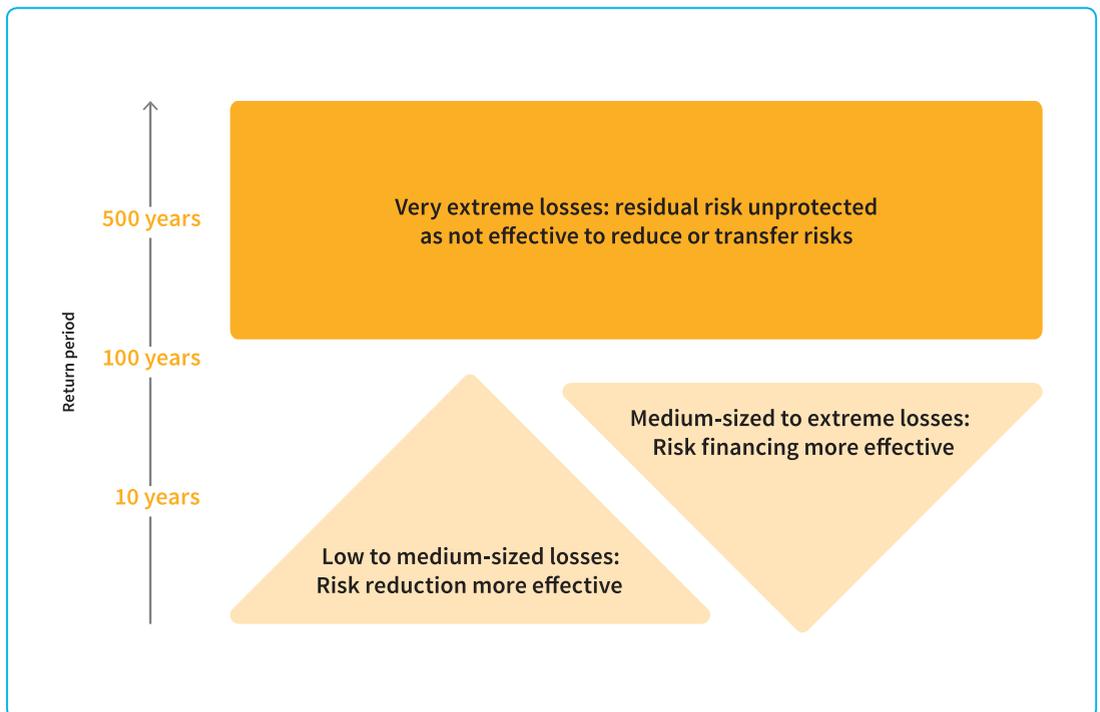
It is more cost-effective to reduce extensive risks with low to medium-sized losses than to rely on risk-financing strategies (Figure 16). And prospective risk management, involving factoring risk reduc-

tion into investment planning is more cost-effective than having to correct risk levels once the investment is made. Without prospective risk management, countries will lose competitiveness and the ability to guarantee the infrastructure that business requires to be competitive itself. However, progress is incipient. Where political pressure exists in favour of investment in particular industries or regions of a country, these imperatives may override the risk and project analysis promoted by technical units of finance ministries.

Land-use planning has not encouraged disaster risk management

Land-use planning is another area with unresolved challenges. Few disaster risk management systems have been able to employ land-use planning and management and influence investment policies effectively. Instead, different public and private institutions transform the landscape of city regions; they push different agendas and operate outside of an overall coherent risk management framework.

Figure 16 Efficiency of risk management instruments and occurrence probability



(Source: Mechler et al., 2012¹⁷)



Significant momentum in the development of disaster risk financing schemes

In the case of intensive risks and medium-sized to extreme losses, risk financing is essential to ensure macroeconomic stability and to facilitate recovery and reconstruction. There is a diversity of recent experiences in risk financing. However, while risk financing is an important component of a comprehensive disaster risk management strategy, to be successful it depends on complementary efforts to reduce risks.

The role of business is gaining importance

Local governments and in particular large municipalities can find strong allies among businesses with significant fixed assets, such as real estate companies, developers, investment banks, major stores and property management firms, to more effectively manage disaster risks. ‘Communities of interest’ are being formed by businesses and local governments, which can play an important role in disaster risk management. However, at present business participation in disaster risk governance frameworks is still limited. Only 28 countries have reported that private sector bodies are represented on their national disaster platforms.

FROM SHARED RISK TO SHARED VALUE

Businesses are gradually shifting to identifying, analysing and managing disaster risks

As awareness of disaster risk grows, more and more businesses will expand their existing risk management strategies to include it and move on from a simple focus on continuity planning. Investments are currently being made in developing new applications and platforms for visualising and managing the disaster risks businesses face. As these and other platforms are brought to the market, corporate risk managers will have access to tools that can enable disaster risk to be integrated into broader risk management efforts. Supply chain risk management may therefore become a vehicle through which large businesses with the necessary capacities can strengthen disaster risk management in SMEs,

which lack those capacities.

Broader analysis enables investment decisions to be taken with eyes wide open

New efforts are stimulating interaction and convergence between private and public risk modelling. Increased availability of open source and open access risk information will facilitate a healthy debate between businesses, governments and insurers regarding risk levels, patterns, trends and pricing. By analysing the cost-effectiveness of different disaster risk management strategies, businesses can decide how much disaster risk to accept, and how much to invest in reducing or sharing that risk. In other words, businesses can now identify how much risk appetite is appropriate for their goals and objectives.

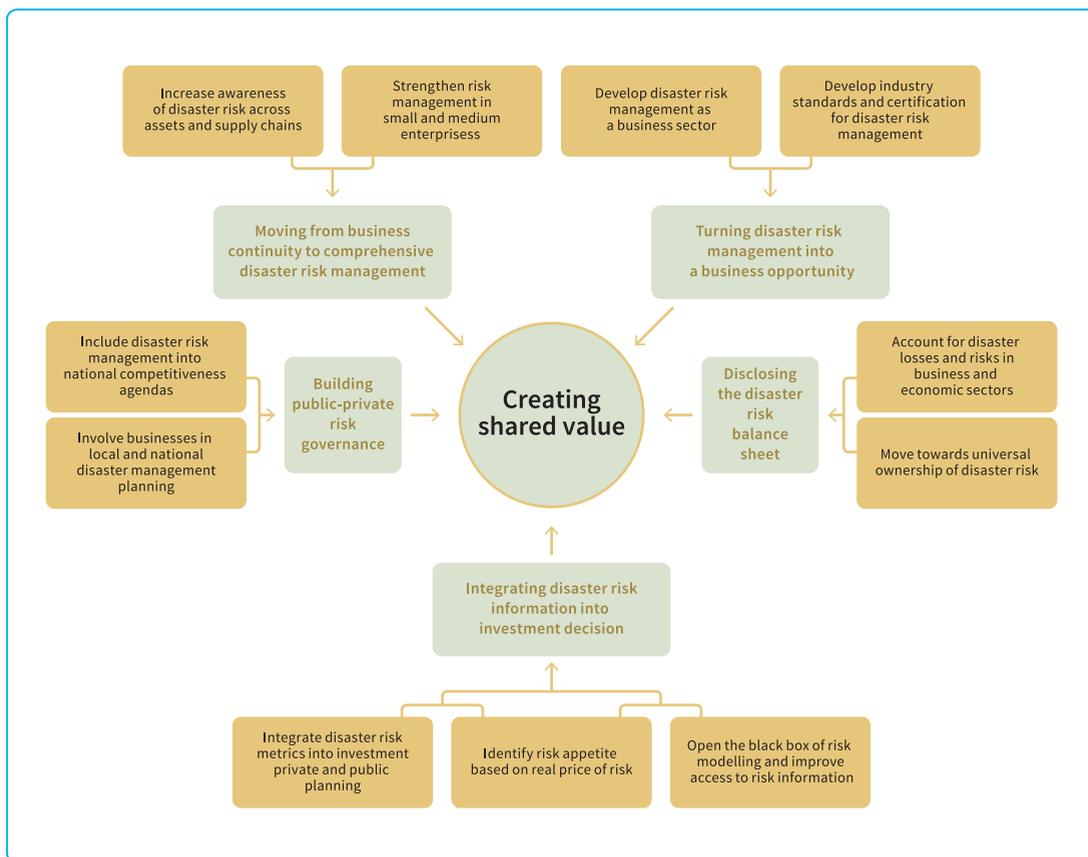
Businesses can prompt governments to strengthen investment in risk reduction

As businesses start to scrutinize the levels of disaster risk internalised in cities and countries before making investment decisions, this will change their investment behaviour over time. Countries with lower risks or which can demonstrate that their disaster risks are effectively managed will then have a comparative advantage to attract investment. From this perspective, attracting continued investment is likely to become one of the primary motivations for strengthening disaster risk management at the national and local levels. Risk-sensitive business investment will also generate a demand for analysis and forecasts that include rather than ignore disaster risk, further encouraging countries to invest in disaster risk management. At the same time, businesses have a vested interest in the effective management of disaster risks in the city regions where they are located. And to manage those risks, national and particularly city and local governments need the participation of business.

Powerful incentive for businesses to identify, estimate and disclose their risks

Reporting on disaster risk by business is currently largely unregulated, but will become increasingly important in future. If disaster risks are accounted

Figure 17 How to create shared value through disaster risk management: key elements of successful private and public engagement



(Source: UNISDR)

for and reported, then investors would factor these risks into their decisions, avoiding businesses with high and unmanaged disaster risk. Improved risk reporting would also be reflected in analyst and credit ratings, further encouraging businesses to invest in effective disaster risk management. Other concepts such as ‘universal ownership’ have the potential to encourage risk-aware investing by large institutional investors, such as pension funds and sovereign wealth funds.

Business seeing disaster risk management as an opportunity and area for development

The size of the market for disaster risk reduction is potentially huge. For example, making the US\$1.9 trillion of foreign direct investment foreseen for 2014 disaster-risk sensitive represents an enormous business opportunity⁴⁸. And foreign investment is only

a small proportion of total investment in produced, natural and intangible capital. A large and growing number of business initiatives are unfolding. This is creating shared value from the sustainable management of natural capital and the environment, from reducing energy consumption and investing in renewable energy and from involving and benefiting local communities and households. Many of these have disaster reduction co-benefits as they address the underlying drivers of risk. The development of disaster risk management as a business sector will be stimulated by the adoption of certification or similar types of ‘seals of approval’ including the development of international standards, such as ISO, but also voluntary industry-specific certification programmes⁴⁹.

Unless this understanding is now integrated into

business investment, the possibility that the goal of the Hyogo Framework for Action (HFA) will be achieved is remote. The future of disaster risk hinges on the extent to which business embraces disaster risk reduction.

As we now approach 2015, international efforts are intensifying to formulate a new framework for disaster risk reduction: HFA2. Ensuring that the business case for disaster risk reduction is explicitly included in that framework will provide a critical incentive for the constructive engagement by business on which future resilience, competitiveness and sustainability depend.

Notes

- 1 In OECD countries, the share of private sector investment in total fixed capital formation was 85 percent in 2010 (OECD. 2013. Investment. National Accounts at a Glance. Paris, France; OECD.). In low- and middle-income countries, the share of private sector investment is lower (almost 70 percent in low and lower middle-income countries and about 64 percent in upper middle-income countries in 2009), but has increased steadily, significantly contributing to total gross fixed capital formation growth. Especially the share in lower middle-income economies increased by almost 10 percent since 1996 (based on World Development Indicators: <http://data.worldbank.org/data-catalog/world-development-indicators>).
- 2 2015 is the year in which three major international development processes will be reviewed and efforts towards sustainable development renewed in the form of the reviewed Millennium Development Goals, the follow-up to Rio+20 in the form of Sustainable Development Goals, and the successor agreement to the Hyogo Framework for Action. To which degree these processes will converge or remain distinct has to be seen.
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- 7 Only the 40 countries with the highest losses were selected for this graph to enable visualisation at common scales.
- 8 www.desinventar.net.
- 9 See for example: http://www.undp.org/content/undp/en/home/presscenter/events/2012/october/international_day_disaster_reduction.
- 10 www.emdat.be.
- 11 See www.munichre.com/touch/naturalhazards and www.emdat.be.
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GAR2013 products

- The Pocket GAR provides the main evidence and messages of the report in a concise, easy-to-use format.
- The main report contains enhanced content links which provide access to dynamic maps, videos, photos, and case studies for users with smartphones and tablets.
- Tablet computer and smartphone users can also enjoy the GAR for Tangible Earth (GfT) free application. GfT, or “gift”, is a fully interactive stand-alone application, which features a 3D globe interface that contains decades of dynamic earth science data sets, including disaster events from all GARs. These data sets are illustrated with interactive risk scenarios, maps, and photos and are searchable by time (including real-time), place, risk driver, hazard, disaster event, and more.
- GAR2013 is also available as a fully interactive web version, with much of the functionality available in products such as:

The main report (PDF) in French, Spanish and Arabic

Interactive main report in English

Appendices

Background papers

Interim national progress reports on the implementation of the Hyogo Framework for Action

Access to disaster loss and risk databases

All GAR2013 products can be accessed via:

www.preventionweb.net/gar/

