

# Chapter 1

## Introduction

### 1.1 The disaster challenge

On 25 April 2015, a major earthquake struck central Nepal, killing more than 8,000 people and destroying a quarter of a million homes. This tragic event was a major disaster, but it was just one of many triggered by natural hazards during the writing of this book. Global disaster data from 2013, the most recent annual analysis to be published, shows that there were 330 reported disasters triggered by geophysical, meteorological and climatological hazards in that year, affecting 108 countries, resulting in more than 21,600 deaths, affecting 96.5 million people and causing damage and losses to the value of \$118.6 billion. In fact, 2013 was much quieter than many previous years: the average annual death toll from such disasters in the decade 2003–12 was 106,654; the average annual number affected was 216m and average annual losses were \$157bn.<sup>1</sup> Between 2008 and 2012, 143.9m people in 125 countries were displaced by a variety of natural hazard events. Many of these displacements were repeated or prolonged.<sup>2</sup>

Disasters are a major problem worldwide and a serious threat to sustainable development. Their impacts are diverse: as well as loss of life, injury and disease and the destruction of property and other assets, disasters can also cause social and economic disruption, loss of infrastructure and other services and damage to the environment. In an increasingly integrated world economy built on networks of global supply chains, disasters in one country can easily affect others, and a shock or disruption to one part of the supply chain, such as a production plant or distribution centre, can have a ripple effect throughout the whole chain. This was illustrated well by two disasters in 2011, an earthquake and tsunami in Japan and extensive flooding in Thailand. Both countries are important suppliers of parts, components and finished products to industries and markets worldwide. In both cases, production of a range of export products was severely disrupted, with a knock-on impact on producers and consumers in many other countries.<sup>3</sup>

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1 D. Guha-Sapir, P. Hoyois and R. Below, *Annual Disaster Statistical Review 2013: The Numbers and Trends* (Louvain: Centre for Research on the Epidemiology of Disasters (CRED), 2013), <http://www.emdat.be/publications>. Data are from the EM-DAT database ([www.emdat.be](http://www.emdat.be)).

2 M. Yonetani et al., *Global Estimates 2014: People Displaced by Disasters* (Oslo: Internal Displacement Monitoring Centre, 2014), [http://www.nrc.no/arch/\\_img/9184209.pdf](http://www.nrc.no/arch/_img/9184209.pdf).

3 UNISDR, *Global Assessment Report on Disaster Risk Reduction 2013* (Geneva: UNISDR, 2013), <http://www.preventionweb.net/english/hyogo/gar/2013/en/home/download.html>, pp. 41–50; L. Ye and M. Abe, *The Impacts of Natural Disasters on Global Supply Chains* (Bangkok: United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), 2012), [www.artnetontrade.org](http://www.artnetontrade.org).

## 1.2 Disasters explained

Disasters result from a combination of factors: the nature of the particular hazard or hazards; the extent to which people and their possessions are exposed to them; the vulnerability of those people and assets; and their capacity to reduce or cope with the potential harm. Many different kinds of hazard can contribute to disasters. These may be natural (e.g. floods, earthquakes, landslides, windstorms), technological (e.g. industrial and transportation accidents) or otherwise created by humans (e.g. riots, terrorist incidents and conflict). They can act in combination, as well as individually: the 2011 tsunami in Japan, for instance, led to a crisis in a nuclear power plant,<sup>4</sup> while earthquakes and intense rainfall can both trigger landslides. Other threats facing human development include economic shocks, the effects of inequality, health risks and food insecurity.

Disasters take place in time as well as in space. They can be short- or long-term in their duration. They can be sudden events (or shocks), such as disease outbreaks, storms, earthquakes and conflict, but they can also arise from the accumulation of stresses, such as long-running drought, the degradation of natural resources, unplanned urbanisation, climate change, political instability and economic decline.

Disasters are generally seen as extreme events in their scale or impact, requiring some form of external assistance. However, small-scale, lower-intensity hazard events can also have significant impacts locally. These small, recurrent events are usually referred to as ‘extensive risks’. Poor people also often face high levels of everyday risk, for example from lack of clean water and sanitation, poor healthcare, pollution, occupational injuries, road accidents, domestic fires, violence and crime.

This book focuses on disasters in which natural hazards play a part, although it also addresses the interaction between such disasters and social crises and conflicts (see Chapter 15: DRR, social crisis and conflict), and the relationship between disaster impacts and prevailing social and economic conditions. The phrase ‘natural disaster’, which is commonly used, is misleading and often causes confusion. Strictly speaking, there is no such thing as a natural *disaster*: there are only natural *hazards*. The difference between a hazard and a disaster is an important one. A disaster takes place when a society or community is affected by a hazard (disaster is usually defined as an event that overwhelms society’s capacity to cope – see Box 1.1: Disaster terminology). In other words, the impact of the disaster is heavily influenced by the community’s vulnerability to the hazard. This *vulnerability* is not natural: it is the human dimension of disasters.

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<sup>4</sup> For the Japan event, see F. Ranghieri and M. Ishiwatari (eds), *Learning from Megadisasters: Lessons from the Great East Japan Earthquake* (Washington DC: World Bank, 2014), <http://elibrary.worldbank.org/doi/abs/10.1596/978-1-4648-0153-2>.

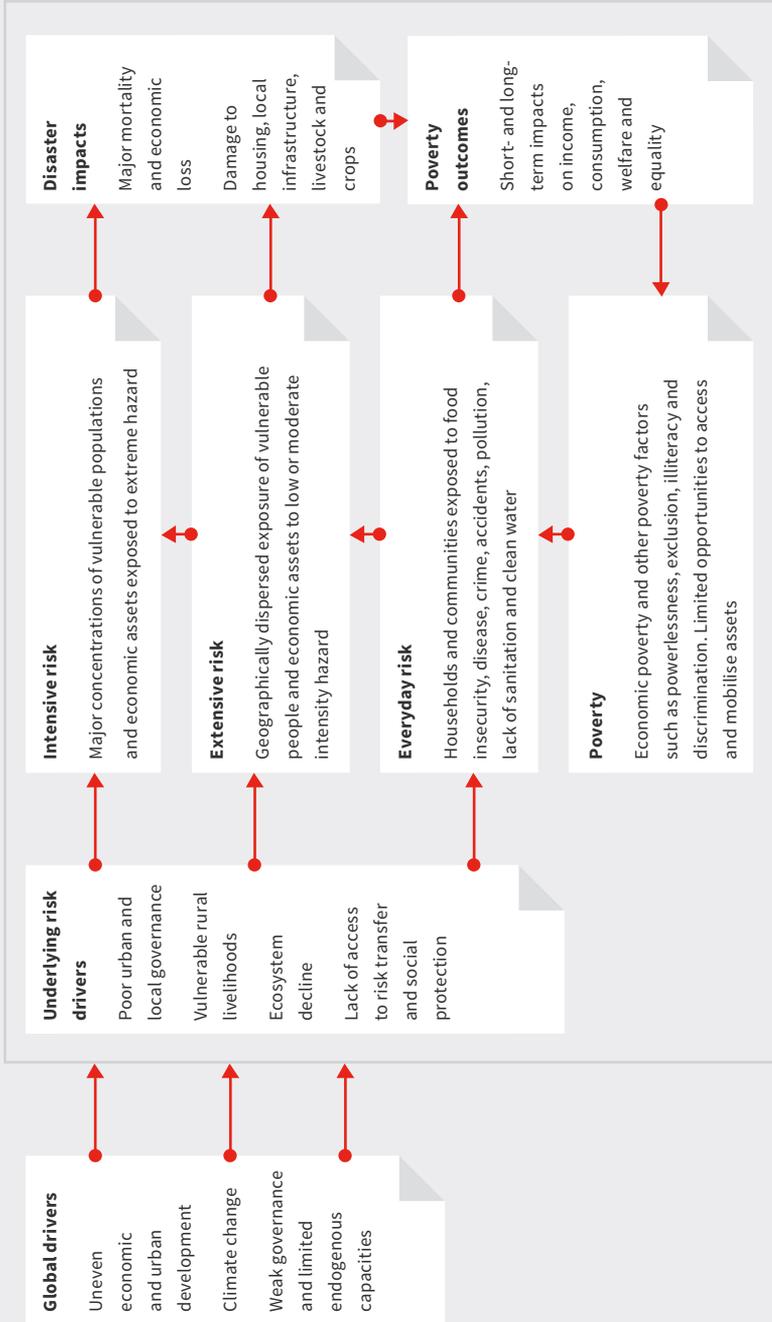
## Box 1.1 Disaster terminology

The literature on hazards, vulnerability and disasters is full of technical terms. This book tries to sidestep the technical jargon as far as possible because many people working in aid and development find it off-putting (a related problem is that use of the emotive word ‘disaster’ automatically conjures up images of emergency relief and often leads to disaster reduction work being viewed solely as an aspect of humanitarian aid when it should also be a central component of development programmes). Nevertheless, certain terms are used regularly in writing and discussion about DRR. These can be defined and understood in slightly different ways and there has been considerable debate about their precise meanings. They are also often used quite loosely or flexibly by practitioners, which can cause confusion or even lead to disputes. Table 1.1 (p. 22) sets out some of the key terms as defined by two international and reputable bodies: the UN Office for Disaster Risk Reduction (UNISDR) and the Intergovernmental Panel on Climate Change’s Special Report on Extreme Events and Disasters. Everyone using DRR terminology should be clear about their own understanding of it, and communicate this to others with whom they work.

Vulnerability is the result of the whole range of economic, social, cultural, institutional and political factors that shape people’s lives and create the environments that they live and work in. Development processes play a key role in exposing people to hazards, as well as shaping their vulnerability to potential disasters. For example, the fact that large numbers of people live in flimsy houses in hazardous locations could result from a combination of several factors: poverty (itself a symptom of local, national and even global economic forces), population growth, displacement due to economic development (e.g. loss of smallholdings to commercial agriculture), migration to towns and cities (which has a variety of socio-economic causes, including livelihood opportunities), legal and political issues, such as lack of land rights, government macro-economic and other policies and other political features, including weak government and civil society institutions.

Extensive research all over the world has shown that in general it is the weaker groups in society that suffer worst from disasters, principally the poor, the very young and the very old, women, the disabled, migrants and displaced people and people marginalised by race, caste or other socio-economic or cultural characteristics (see Chapter 5: Inclusion). Those who are already at an economic or social disadvantage because of one or more of these characteristics tend to be more likely to suffer during disasters. Vulnerability is not just about poverty, but poverty is a fundamental factor. Disasters’ impact on society is uneven and unequal: poor and socially marginalised households tend to be much more vulnerable to losses than wealthier households; they are pushed deeper into poverty as a result; and they find it more difficult to recover.

**Figure 1.1** The disaster risk–poverty nexus



## Case Study 1.1 Central European floods, 2013

Germany, Austria, Hungary and the Czech Republic were badly affected by flooding in June 2013. Flood protection and water storage structures, such as levees, water diversion channels, dams and lakes and restored floodplains (many of which had been created following devastating floods in Central Europe in 2002), generally proved effective in preventing flooding, especially in major towns and cities, but in some places they were overwhelmed by the exceptionally high water levels, or there were gaps in the defences that allowed floodwater through. Although the death toll was relatively low (25 people were killed), estimates of economic losses ranged from €11.9bn (\$16.5bn) to €16bn (\$22bn). In Germany alone, an estimated 52,500 people along the Danube and Elbe rivers were forced to leave their homes.

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Zurich Insurance, *Central European Floods 2013: A Retrospective* (Zurich: Zurich Insurance Company, 2014), <http://knowledge.zurich.com/flood-resilience/risk-nexus-central-european-floods-2013-a-retrospective>.

This issue of vulnerabilities linked to socio-economic context (in particular inequalities in society) is very important in understanding the impact of disasters and making choices about how and where to intervene. Vulnerability is highly dynamic, changing in response to many different influences, yet most vulnerabilities remain persistent because they result from deep-rooted social marginalisation, the indifference or incapacity of political and official institutions and the inadequacy of public services.

Disasters affect rich as well as poor countries (see Case Study 1.1: Central European floods, 2013), but they have a particularly severe impact on low-income countries, which experience disproportionately higher mortality and suffer higher levels of economic loss in relation to the size of their GDP. Disaster events can sometimes set back years of economic and social development gains, generate political instability and cause long-lasting environmental damage. Like poor families, low-income countries often lack the resources and capacities to cope with disasters (see Box 1.2: DRR capacities in richer and poorer countries).

The multiple pressures and factors that combine to create and increase vulnerability can be tracked to identify a 'progression' of vulnerability (see Figure 1.2: The progression of vulnerability). These pressures can be released by taking measures to reduce vulnerability right along the causal chain – an indication of the wide range of interventions that are possible.

## Box 1.2 DRR capacities in richer and poorer countries

Richer countries	Poorer countries
<ul style="list-style-type: none"><li>• Have regulatory frameworks to minimise disaster risk which are enforced</li><li>• Have effective early warning and information mechanisms in place to minimise loss of life</li><li>• Have highly developed emergency response and medical care systems</li><li>• Insurance schemes spread the burden of property losses</li></ul>	<ul style="list-style-type: none"><li>• Regulatory frameworks are weak or absent, and/or the capacity to enforce them is lacking</li><li>• Lack comprehensive information systems linked to pre-emptive response</li><li>• Divert funds from development programmes to emergency assistance and recovery</li><li>• Those affected bear the full burden of property losses and may lose livelihoods</li></ul>

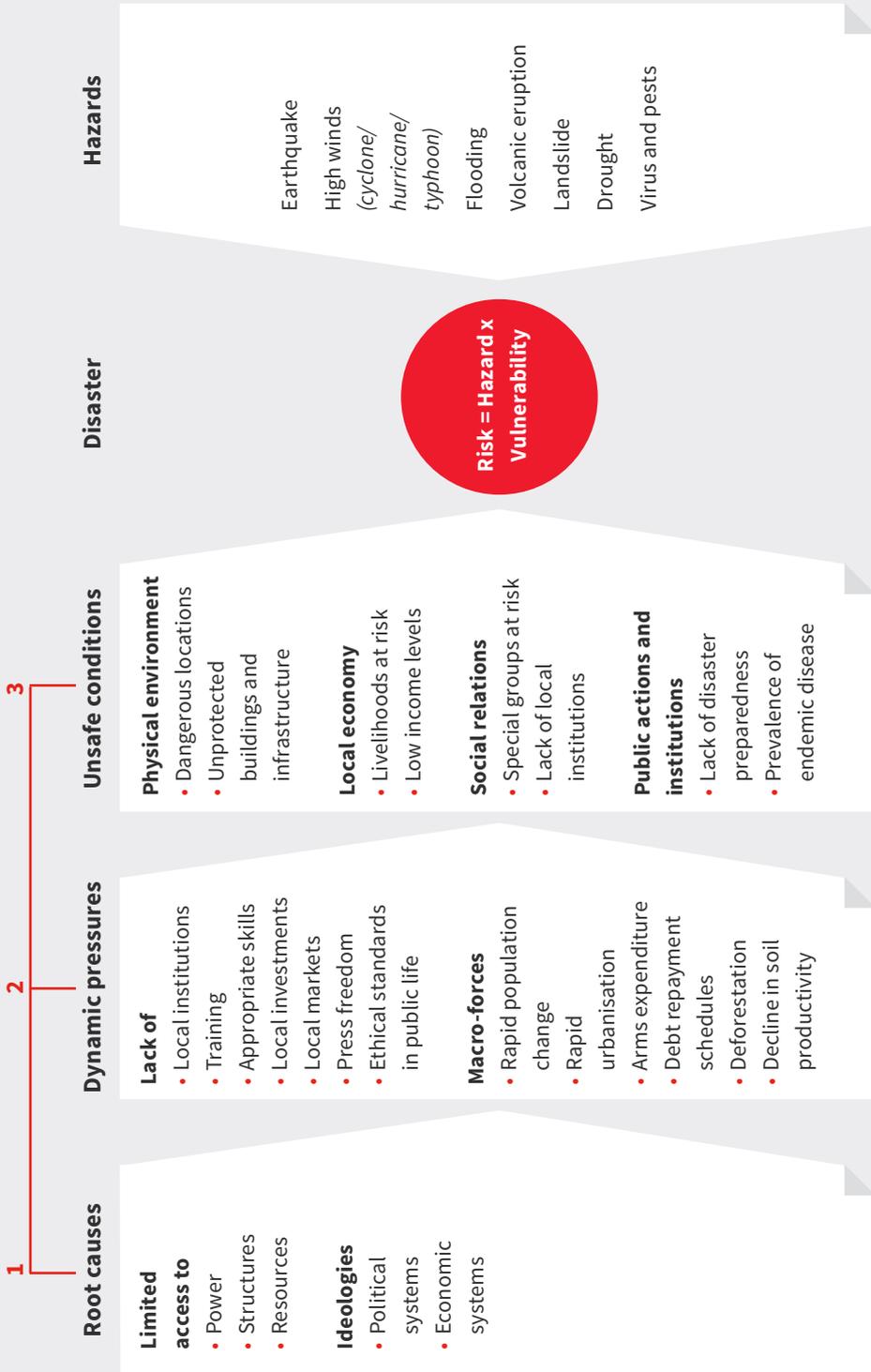
P. White et al., *Disaster Risk Reduction: A Development Concern* (London: Department for International Development, 2004), [http://www.preventionweb.net/files/1070\\_drrscopingstudy.pdf](http://www.preventionweb.net/files/1070_drrscopingstudy.pdf), p. 9.

Even well-intentioned development programmes can increase vulnerability. For example, building embankments for new roads and railway lines can block natural flood drainage channels, and the promotion of heavily irrigated rice agriculture can lead to increased incidence of malaria because mosquitoes breed where there is standing water.

### 1.3 Disaster risk reduction

What is disaster risk reduction (or DRR)? There are various definitions in the technical literature (see Box 1.1: Disaster terminology), but it is broadly understood to mean the development and application of policies, strategies and practices to reduce vulnerabilities and disaster risks throughout society. The term 'disaster risk management' (DRM) is often used in the same context, referring to a systematic approach to identifying, assessing and reducing risks. DRM is more focused on the practical implementation of initiatives to achieve DRR goals, but there is some overlap between the two terms and in practice they are sometimes used quite loosely or flexibly, with very similar meanings. In this book, the term DRR is applied in the broader sense to cover policy, strategic, institutional and operational issues (reflecting the wide scope of the book itself), whilst the term DRM is

**Figure 1.2 The progression of vulnerability**



B. Wisner et al., *At Risk: Natural Hazards, People's Vulnerability and Disasters* (London: Routledge, 2004), p. 51.

## Case Study 1.2 Linking DRR interventions

A community-based DRR project in the village of Genda Ada, Ethiopia, adopted a range of linked approaches to reduce short-term hazard risk and promote long-term livelihood security. The village lies at the foot of a large hillside which had been severely degraded by years of deforestation and quarrying. As a result, crop and livestock productivity fell, leading in turn to greater food insecurity and poverty, forcing some of the inhabitants to move to towns in search of work. Flood risks also increased, as water ran off the hills. In 2006 flash floods nearby killed 17 people and ruined crops and farmland.

Jerusalem Children and Community Development Organisation (JeCCDO), an Ethiopian NGO which provided emergency assistance after the 2006 floods, continued to work in the area to build long-term resilience to disasters. Its staff received training in community-based DRR methods (see Chapter 6 for a discussion of this approach). Then, following consultations with local leaders, it mobilised villagers to carry out a local risk and vulnerability

assessment which highlighted flooding and drought as the main hazards.

A community DRR committee was established, a vulnerability map was drawn up and an action plan developed. The hillside was rehabilitated by constructing terraces, trees were planted and access to conservation areas was restricted to allow vegetation to regenerate more quickly. These measures helped to reduce the speed and volume of water flowing downhill, and enabled floodwater to be diverted to irrigate fields. A community flood warning system was established, with rainfall information being shared by cell phone. The project provided households with loans to buy livestock and gave training in livestock rearing. Farmers' cooperatives and self-help groups were formed. JeCCDO also organised training and site visits for local government officials, and the mayor of the nearby town allocated funds for the rehabilitation of a neighbouring hillside. The community also pressed successfully for the local town administration to build additional flood defences.

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Cordaid and IIRR, *Community Managed Disaster Risk Reduction: Experiences from the Horn of Africa* (The Hague and Nairobi: Cordaid and International Institute of Rural Reconstruction, 2011), [https://www.cordaid.org/media/publications/CMDRR\\_experience\\_Horn\\_of\\_Africa\\_1.pdf](https://www.cordaid.org/media/publications/CMDRR_experience_Horn_of_Africa_1.pdf), pp. 45–48.

used more specifically to refer to aspects of operational practice. But a key point about both terms is that they describe a very broad-based approach to the causes of disasters and dealing with their consequences.

The basic principle underlying this Good Practice Review is that disaster programming should adopt a *risk management* approach – i.e. a systematic approach to identifying, assessing and reducing risks associated with hazards and human activities. Risk management should be an integral part of the way organisations do their work: not an add-on or a one-off action but a process of constant improvement. The risk management approach recognises that there is a wide range of geological, meteorological, environmental, technological, socio-economic and political threats to society. Risks are located at the point where hazards, communities and environments interact, and so effective risk management must address all of these aspects. Disasters are seen not as one-off events to be responded to, but as deep-rooted and longer-term problems that must be planned for. Effective risk management generally involves a variety of different but related actions. Such integrated approaches work best when they are informed by specific local conditions and targeted towards local needs (see Case Study 1.2: Linking DRR interventions).

Disaster risk is not a distinct sector. It should be everyone's business and, as this book shows, an extensive range of options and approaches is available. Project planners and managers need to take a very broad view of the options available to them, and they ought to be imaginative in their approach. It follows that DRR should be integrated into long-term development planning to reduce underlying socio-economic vulnerabilities, protect interventions against hazards and ensure that development policies and programmes do not inadvertently increase or create risks (see Case Study 1.3: Connecting development and disaster risk management).

DRR and other forms of risk management should not be seen simply as defensive measures: they also facilitate positive change. Improved security and safety provide vital support and opportunity to households, communities, societies and governments so that they can undertake development initiatives that improve well-being, strengthen livelihoods and contribute to sustainable development. Effective DRR actions provide development benefits in the short term, as well as contributing to vulnerability reduction in the long term, although in practice there may be trade-offs between different goals.

Traditional approaches to disaster management have usually been based on the 'disaster cycle', a conceptual model that is still used by many emergency management and civil protection organisations (see Figure 1.3: The disaster cycle). This is a linear operational model, dividing the cycle into phases (before, during and after disaster), each of which requires different forms of intervention (mitigation, preparedness, response and recovery). The formulation is easy to understand and makes it easy for disaster management organisations to allocate tasks,

## Case Study 1.3 Connecting development and disaster risk management

Following severe flooding in 2000, which affected more than 4.5m people, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) began a project with villages along the Búzi River in central Mozambique to reduce disaster risk and integrate DRM into wider rural development initiatives. A large part of the population of Búzi District depended on subsistence farming, rural poverty was widespread and public infrastructure and services were limited. River flooding was a major hazard, with many municipalities sited close to the river; cyclones and droughts also affected parts of the district.

In 2003 GTZ combined its earlier development and reconstruction initiatives into a single integrated programme with four main components: district development planning, strengthening local government and communities, technological innovation and adaptation and sustainable use of natural resources and DRM. The project collaborated with a range of actors (government, community, NGO, private sector) at village, district and provincial levels, as well as with scientific institutions collecting and disseminating meteorological and hydrological data. Workshops, seminars and other meetings on DRM and climate change targeted decision-makers and communities, and a local radio station broadcast information about disasters and how to manage them.

Following discussions with officials, a long-term process was developed for integrating DRM into district development planning. A detailed and comprehensive risk analysis was carried out in nine especially disaster-prone municipalities. Local DRM committees were set up in particularly endangered villages, and their members were provided with training and equipment to plan and carry out emergency response. Simulation exercises were carried out and local early warning systems established (see Case Study 16.6: A community-managed flood warning system). Other measures included introducing regulations for cyclone-resistant public facilities such as schools and hospitals, and the construction of new settlements in less hazardous locations.

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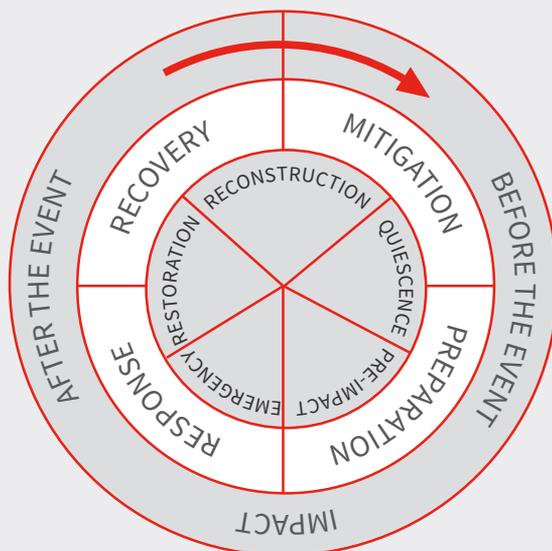
J. Ferguson, *Disaster Risk Management along the Rio Búzi* (Eschborn: GTZ, 2005), <http://www.preventionweb.net/english/professional/publications/v.php?id=10527>.

## Box 1.3 Five insights on the process of risk management

1. Taking on risks is necessary to pursue opportunities for development. The risk of inaction may well be the worst option of all.
2. To confront risk successfully, it is essential to shift from unplanned and ad hoc responses when crises occur to proactive, systematic and integrated risk management.
3. Identifying risks is not enough: the trade-offs and obstacles to risk management must also be identified, prioritised, and addressed through private and public action.
4. For risks beyond the means of individuals to handle alone, risk management requires shared action and responsibility at different levels of society, from the household to the international community.
5. Governments have a critical role in managing systemic risks, providing an enabling environment for shared action and responsibility, and channelling direct support to vulnerable people.

World Bank, *World Development Report 2014: Risk and Opportunity* (Washington DC: World Bank, 2013), <http://www.worldbank.org/wdr2014>.

### Figure 1.3 The disaster cycle



D. Alexander, *Principles of Emergency Planning and Management* (Harpenden: Terra Publishing, 2002), p. 6.

which may be one of the main reasons for its enduring popularity, but it does not capture the complexity of disasters, which cannot be neatly compartmentalised in this way. It can also lead to fragmentation of effort operationally. Risk management models, which are largely derived from business and organisational management thinking, are also based on a linear sequence of actions, but provide a different perspective on how to approach disasters, in that risk management is seen as a constantly repeating process of risk identification, analysis and treatment that incorporates feedback and learning.<sup>5</sup>

DRR planning, implementation and evaluation require holistic models and frameworks that are not confined to particular types of intervention or moments in time. The most influential of these to date has been the Hyogo Framework for Action 2005–2015, agreed by member states of the United Nations at the Second World Conference on Disaster Reduction in Kobe, Japan, in January 2005.<sup>6</sup> The framework sets out a number of key and mutually supporting activities grouped under five main priorities for action:

1. Ensure that disaster risk reduction (DRR) is a national and a local priority with a strong institutional basis for implementation.
2. Identify, assess and monitor disaster risks and enhance early warning.
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels.
4. Reduce the underlying risk factors.
5. Strengthen disaster preparedness for effective response at all levels.

The framework has been widely used by governments and civil society organisations at national and local levels; agencies have also adapted it to make it more appropriate to their own work.<sup>7</sup>

The Sendai Framework for Disaster Risk Reduction 2015–2030 (see Figure 1.4), the UN system's successor to the Hyogo Framework, was approved at the Third World Conference on Disaster Risk Reduction in Sendai, Japan, in March 2015. The framework has four priority areas: understanding disaster risk; strengthening disaster risk governance;

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**5** InConsult, *Risk Management Update: ISO 31000: Overview and Implications for Managers*, 2009, <http://www.inconsult.com.au/wp-content/uploads/ISO-31000-Overview.pdf>, p. 4.

**6** The Hyogo Framework for Action is at [http://www.unisdr.org/files/8720\\_summaryHFP20052015.pdf](http://www.unisdr.org/files/8720_summaryHFP20052015.pdf).

**7** A similar approach has been adopted by the World Bank's Global Facility for Disaster Reduction and Recovery (GFDRR) in the operational framework for its strategy 2013–15. See GFDRR, *Managing Disaster Risks for a Resilient Future* (Washington DC: World Bank, 2013), [https://www.gfdr.org/sites/gfdr/files/publication/GFDRR\\_Strategy\\_Endorsed\\_2012.pdf](https://www.gfdr.org/sites/gfdr/files/publication/GFDRR_Strategy_Endorsed_2012.pdf).

investing in disaster risk reduction for resilience; and enhancing disaster preparedness for effective response, and to ‘Build Back Better’ in recovery, rehabilitation and reconstruction.<sup>8</sup>

## 1.4 DRR and climate change adaptation

Climate change is predicted to increase the frequency and severity of certain types of hazard event in many parts of the world. Gradual climatic changes are also likely to have a significant impact on people’s vulnerability. The risk environment is changing and the speed and scale of these changes may be greater than in the recent past. There is also a large degree of uncertainty about future climate change risks and their impacts: climate change may generate new threats which regions and populations have no experience of. People have always adapted their livelihoods and ways of living to climate variability. However, changes in variability are putting pressure on many vulnerable communities’ capacity to adapt, cope and respond, as well as increasing their exposure to weather-related risks. Climate change also affects people indirectly by influencing prices in crop and livestock markets (at global and more local scales), triggering environmental and economic migration and potentially creating conflicts over natural resources.

In the past, climate change and DRR specialists have operated largely in isolation from one another. However, a growing number of thinkers and organisations are working on ways of integrating DRR with climate change adaptation (CCA), as well as mainstreaming both into development. Development, DRR and CCA are interdependent and mutually reinforcing areas of policy, strategy and action. The key challenge is how to achieve this convergence at conceptual, strategic and operational levels.

In many ways, DRR and CCA have overlapping aims and involve similar kinds of intervention. They share the aim of reducing the impacts of shocks by anticipating risks and addressing vulnerabilities. In practice, CCA and DRR interventions range from supporting long-term sustainable development and vulnerability reduction to more specific measures to help societies adapt to, protect against, prepare for and respond to risks and hazards. This includes adapting development practices to long-term environmental stresses, as well as reducing or managing the risks associated with more frequent, severe and unpredictable weather events.

A stronger connection between the two areas of work could help to reduce losses from climate-related disasters. CCA measures can become more effective by building on existing DRR experiences and through more widespread implementation of DRR. DRR practitioners

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<sup>8</sup> See <http://www.preventionweb.net/files/resolutions/N1514318.pdf>.

# Figure 1.4 Chart of the Sendai Framework for Disaster Risk Reduction 2015–2030

## Scope and Purpose

The present framework will apply to the risk of small-scale and large-scale, frequent and infrequent, sudden and slow-onset disasters, caused by natural or manmade hazards as well as related environmental, technological and biological hazards and risks. It aims to guide the multi-hazard management of disaster risk in development at all levels as well as within and across all sectors

## Expected Outcome

The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries

## Goal

Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience

## Targets

Substantially reduce global disaster mortality by 2030, aiming to lower average per 100,000 global mortality between 2020–2030 compared to 2005–2015	Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 between 2020–2030 compared to 2005–2015	Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030	Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030	Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020	Substantially increase international cooperation through adequate and sustainable support to complement their national actions for implementation of this framework by 2030	Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030
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## Priorities for Action

There is a need for focused action within and across sectors by States at local, national, regional and global levels in the following four priority areas.

### Priority 1

#### Understanding disaster risk

Disaster risk management needs to be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment

### Priority 2

#### Strengthening disaster risk governance to manage disaster risk

Disaster risk governance at the national, regional and global levels is vital to the management of disaster risk reduction in all sectors and ensuring the coherence of national

### Priority 3

#### Investing in disaster risk reduction for resilience

Public and private investment in disaster risk prevention and reduction through structural and non-structural measures are essential to enhance the economic, social,

### Priority 4

#### Enhancing disaster preparedness for effective response, and to 'Build Back Better' in recovery, rehabilitation and reconstruction

Experience indicates that disaster preparedness needs to be strengthened for more effective response and ensure capacities are in place for effective recovery. Disasters have also

## Priorities for Action (cont'd)

and local frameworks of laws, regulations and public policies that, by defining roles and responsibilities, guide, encourage and incentivize the public and private sectors to take action and address disaster risk	health and cultural resilience of persons, communities, countries and their assets, as well as the environment. These can be drivers of innovation, growth and job creation. Such measures are cost-effective and instrumental to save lives, prevent and reduce losses and ensure effective recovery and rehabilitation	for effective recovery. Disasters have also demonstrated that the recovery, rehabilitation and reconstruction phase, which needs to be prepared ahead of the disaster, is an opportunity to 'Build Back Better' through integrating disaster risk reduction measures. Women and persons with disabilities should publicly lead and promote gender-equitable and universally accessible approaches during the response and reconstruction phases
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## Guiding Principles

Primary responsibility of States to prevent and reduce disaster risk, including through cooperation	Shared responsibility between central Government and national authorities, sectors and stakeholders as appropriate to national circumstances	Protection of persons and their assets while promoting and protecting all human rights including the right to development	Engagement from all of society	Full engagement of all State institutions of an executive and legislative nature at national and local levels	Empowerment of local authorities and communities through resources, incentives and decision-making responsibilities as appropriate	Decision-making to be inclusive and risk-informed while using a multi-hazard approach
Coherence of disaster risk reduction and sustainable development policies, plans, practices and mechanisms, across different sectors	Accounting of local and specific characteristics of disaster risks when determining measures to reduce risk	Addressing underlying risk factors cost-effectively through investment versus relying primarily on post-disaster response and recovery	'Build Back Better' for preventing the creation of, and reducing existing, disaster risk	The quality of global partnership and international cooperation to be effective, meaningful and strong	Support from developed countries and partners to developing countries to be tailored according to needs and priorities as identified by them	

already use a variety of methods and tools to assess risks and vulnerability (see Chapter 3: Project planning) which can be used or modified for adaptation work. DRR approaches are more likely to be sustainable if they take climate change forecasts into account. DRR would benefit from the longer-term perspective of CCA and its emphasis on addressing the underlying drivers of vulnerability and building adaptive capacities to deal with future problems. Greater collaboration could also make more efficient use of limited human, material and financial resources, although it is not necessarily easy to bring such a wide range of scientists, practitioners and policymakers together.

Although DRR and CCA have much in common, they also have differences in their scope and emphasis. The most obvious is that CCA seeks to manage and reduce risks associated specifically with changes in the climate, whereas DRR also considers other hazards and risks (e.g. earthquakes, volcanic eruptions). In adaptation, the emphasis is more on long-term changes in average climatic conditions, whereas DRR focuses on extreme events. CCA strategies are based on climate science projections of future changes and threats (and the associated uncertainties), whereas DRR remains more grounded in current risks, previous experience and local knowledge. A further challenge is that there is often a lack of climate data on the more local scale at which many development and DRR interventions work.

At a global level, there is already a substantial alliance of scientists, environmentalists and businesses (notably insurers) engaged in advocacy to reduce greenhouse gas emissions. At more local levels, disaster workers are sometimes unsure what they can do about climate change beyond what they are already doing to minimise risk. How can they calculate the increased risk due to this problem? How far should their existing disaster planning be stepped up, expanded or altered to counter the threat from climate change? Although there has been much discussion about new or alternative frameworks and tools for bringing DRR and CCA work closer together operationally, agencies are finding that integration can sometimes be achieved relatively simply by modifying existing project planning methods and tools to incorporate a wider range of questions and information. This has been particularly useful in adapting standard risk, vulnerability and capacity assessment tools (see Chapter 3: Project planning) such as seasonal calendars, historical profiles and risk mapping to identify longer-term climate trends and uncertainties.<sup>9</sup> Many participatory assessments can be adapted in this way (see Case Study 1.4: Identifying and integrating DRR, CCA and other concerns through participatory assessments).

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<sup>9</sup> For example, see 'Yumi Stap Redi Long Climate Change': *Integrating Climate with Vulnerability and Capacity Assessment in Vanuatu* (The Hague: Red Cross Red Crescent Climate Centre, 2013); *Changing Tools in a Changing Climate: Experiences from the Philippines* (The Hague: Red Cross Red Crescent Climate Centre, 2012), <http://www.climatecentre.org/publications/case-studies>.

## Case Study 1.4 Identifying and integrating DRR, CCA and other concerns through participatory assessments

A research project in Papua New Guinea in 2006–2007 facilitated participatory situation analyses in three rural communities. The aim was to enable the communities to identify and assess evidence, problems and solutions. Each community carried out a detailed situation analysis using participatory tools such as mapping, timelines, seasonal calendars and environmental trend analysis. These enabled them to identify a number of changes in their lives and environments over the years, and to see links between community activities, the environment and increasing natural hazard events and impacts. One community identified connections between local land use practices and the greater frequency of landslides and floods; another realised that farming practices and land clearance were contributing to riverbank erosion. The community groups went on to review the underlying causes of these problems, situating them in a broader development context. All three communities felt, without prompting, that changes in the climate were affecting their vulnerability. However, they saw climate change as just one of the major underlying problems facing them, which included land degradation, lack of government support, population growth and globalisation.

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J. Mercer, 'Disaster Risk Reduction or Climate Change Adaptation: Are We Reinventing the Wheel?', *Journal of International Development*, 22(2), 2010.

## 1.5 Resilience

In recent years, the concept of resilience has become prominent in development and humanitarian debate and policy. It is widely seen as a useful organising concept that can be applied across different sectors and disciplines, helping to break down the boundaries between them. Resilience seeks to strengthen capacities to cope with a wide range of threats, both anticipated and unforeseen. DRR is a key part of resilience-building.

Like vulnerability, resilience is a complex and multifaceted idea applied to dealing with different kinds and severities of risk, shock, stress and environmental change. Resilience and vulnerability are often seen as opposites, but this view is restrictive and somewhat simplistic. Both are relative terms: it is necessary to ask what it is that particular individuals, communities and systems are vulnerable or resilient to, to what extent, in what ways and why this is so. Resilience is related to capacity, but is a broader concept that goes beyond the specific resources, plans and actions normally understood as capacities. However, in

## Box 1.4 Defining resilience

Many attempts have been made to define and explain what ‘resilience’ means in different contexts. This has led to a variety of concepts and definitions. For operational purposes, DRR and development agencies often find it more useful to work with more straightforward or widely accepted definitions expressing commonly understood features of resilience. One such definition of resilience is:

*The ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions.*<sup>10</sup>

Some organisations choose to work out their own understanding of resilience, matched to their own work and organisational goals. The UK Department for International Development (DFID) defines disaster resilience as:

*the ability of countries, communities and households to manage change, by maintaining or transforming living standards in the face of shocks or stresses – such as earthquakes, drought or violent conflict – without compromising their long-term prospects.*<sup>11</sup>

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(See also Box 1.1: Disaster terminology)

everyday usage the terms ‘resilience’ and ‘capacity’ are sometimes used quite loosely and interchangeably. Resilience has also been understood both as a desired outcome (a safe and resilient community) and as a process leading to that outcome (enabling individuals, communities and institutions to adapt and move towards resilience).

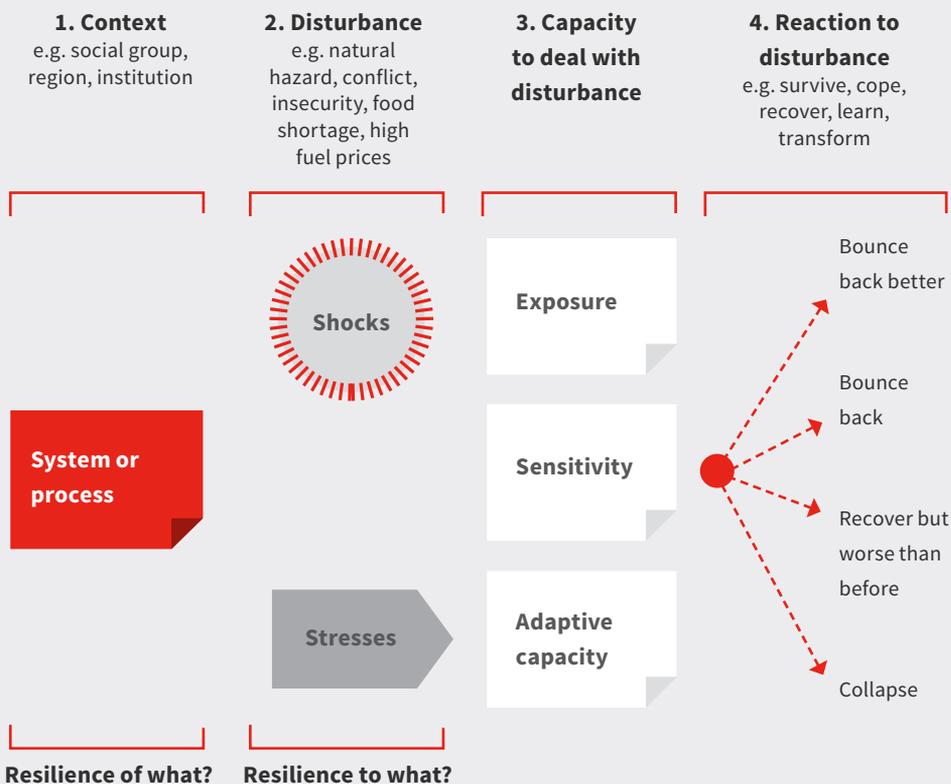
A disaster resilience perspective should be holistic. All relevant aspects and issues should be taken into account to produce a comprehensive analysis of disaster-related problems. This will support the development of coherent, wide-ranging strategies and programmes involving a variety of complementary and mutually supporting interventions, with the aim

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<sup>10</sup> IPCC, *Managing the Risks of Extreme Events and Disasters To Advance Climate Change Adaptation: Special Report of the Intergovernmental Panel on Climate Change* (New York: Cambridge University Press, 2012), <http://ipcc-wg2.gov/SREX/report>.

<sup>11</sup> DFID, *Defining Disaster Resilience: A DFID Approach Paper* (London: Department for International Development, 2011), [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/186874/defining-disaster-resilience-approach-paper.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/186874/defining-disaster-resilience-approach-paper.pdf), p. 6.

## Figure 1.5 DFID's Resilience Framework



DFID, *Defining Disaster Resilience: A DFID Approach Paper* (London: Department for International Development, 2011), [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/186874/defining-disaster-resilience-approach-paper.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/186874/defining-disaster-resilience-approach-paper.pdf), p. 7.

of moving people permanently out of vulnerability. Such an approach contrasts with more conventional disaster programming, which has often focused only on specific hazards and discrete aspects of vulnerability and resilience. Figure 1.5 (DFID's Resilience Framework) is a visualisation of such a holistic perspective; many other agencies have developed similar frameworks of their own.

Resilience thinking encourages a systems approach to enable a better understanding of how different types of system (e.g. ecological, socio-economic, technological, political) interact with one another, and the connections and interactions between different elements within particular systems (e.g. between electricity supplies and railway services in a public transport

## Box 1.5 Disasters and ecosystems

Risk and vulnerability are linked not only to environmental hazards but also to the environment more generally. Human and ecological systems are interdependent and human actions can have a significant impact on ecosystems. Environmental degradation increases hazard risk and contributes to vulnerability. For example, the removal of trees, bushes and other vegetation in the course of building, farming or other commercial activities can create hazardous conditions. It accelerates the loss of fertile topsoil to wind and water erosion. Water is no longer held in the soil by vegetation and so runs away rapidly, increasing vulnerability to drought. On hillsides, rapid water run-off can cause flash floods and landslides, which in turn silts up rivers and may cause flooding further downstream. In coastal zones, the destruction of mangrove forests for commercial development removes a natural barrier to the winds and sea surges created by tropical cyclones. Overgrazing and over-cultivation of land can exhaust soils. Building on flood plains reduces the capacity of the ground to absorb rainfall, increasing the likelihood of flooding.

Ecosystem management can make an important contribution to disaster reduction. Healthy ecosystems provide protection against hazards: for example, wetlands such as marshes and swamps store water and provide an outlet for floodwaters; coral reefs and sand dunes protect shorelines. Productive ecosystems support sustainable livelihoods and income-generating activities, and they can be important assets for communities in the aftermath of disasters. Natural resources can be managed and replenished through measures such as reforestation and other planting, waste management, environmentally sustainable farming and grazing practices, terracing and building protective stone and earthworks to prevent rapid water run-off.

Attempts to protect the environment often challenge powerful people who stand to gain from its destruction: it can be difficult and even dangerous to make such challenges. More generally, economic and demographic pressures on poor countries, coupled with entrenched political and cultural attitudes, inhibit effective responses to environmental crises.

system). Systems and system interactions can be very complex: a good example of this is the relationship between ecosystems and human systems, which is a significant factor in disaster risk and vulnerability (see Box 1.4: Disasters and ecosystems). Disasters often result from multiple and interacting failures within a system. In New Orleans during Hurricane Katrina in 2005, for example, a complex urban system failed because of a combination of factors, including the widespread failure of flood defences, ineffective emergency planning and response, weaknesses in disaster governance, high levels of exposure to risk and deep-rooted socio-economic vulnerability and marginalisation (the last two factors the result of the city's historic patterns of growth and development).<sup>12</sup> Resilience approaches and systems thinking help agencies to understand and deal with such complex situations. Projects and programmes cannot manage everything, but they can assess where they will be most effective, identify the best entry or leverage points, build relationships with other key stakeholders and coordinate different types of intervention that stimulate more widespread and lasting system changes.

Resilience is clearly helpful in enabling DRR organisations to identify their vision and direction. However, some find it a challenge to understand exactly what it means in practice and how it can be applied to their work.<sup>13</sup> Resilience-building is a new approach and organisations have much to learn about resilience programming in practice. Some so-called 'resilience' projects seem to be no different from previous forms of intervention: they represent re-branding rather than re-thinking. Resilience has also been criticised for not paying enough attention to power relations within communities and societies: one group or community may become more resilient at the expense of another because it has more resources and choices. For this reason, it has been suggested that one aim of resilience initiatives should be social transformation and the reduction of inequalities.

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<sup>12</sup> L. Comfort, 'Cities at Risk: Hurricane Katrina and the Drowning of New Orleans', *Urban Affairs Review*, 41(4), 2006.

<sup>13</sup> For a discussion of these issues, see A. Pain and S. Levine, *A Conceptual Analysis of Livelihoods and Resilience: Addressing the 'Insecurity of Agency'* (London: Overseas Development Institute, 2012), <http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/7928.pdf>.

**Table 1.1 Some key DRR terms**

UN Office for Disaster Risk Reduction (UNISDR)	Intergovernmental Panel on Climate Change (IPCC) Special Report on Extreme Events and Disasters
<p><b>Adaptation</b> The adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.</p>	<p><b>Adaptation</b> In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate.</p>
	<p><b>Adaptive capacity</b> The combination of the strengths, attributes, and resources available to an individual, community, society or organisation that can be used to prepare for and undertake actions to reduce adverse impacts, moderate harm or exploit beneficial opportunities.</p>
<p><b>Capacity</b> The combination of all the strengths, attributes and resources available within a community, society or organisation that can be used to achieve agreed goals.</p>	<p><b>Capacity</b> The combination of all the strengths, attributes and resources available to an individual, community, society or organisation, which can be used to achieve established goals.</p>
<p><b>Climate change</b> (Cites IPCC and UNFCCC definitions)</p>	<p><b>Climate change</b> A change in the state of the climate that can be identified (e.g. by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use.</p>

Table 1.1 (cont'd)

UN Office for Disaster Risk Reduction (UNISDR)	Intergovernmental Panel on Climate Change (IPCC) Special Report on Extreme Events and Disasters
<p><b>Disaster</b> A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.</p>	<p><b>Disaster</b> Severe alterations in the normal functioning of a community or a society due to hazardous physical events interacting with vulnerable social conditions, leading to widespread adverse human, material, economic, or environmental effects that require immediate emergency response to satisfy critical human needs and that may require external support for recovery.</p>
<p><b>Disaster risk</b> The potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period.</p>	<p><b>Disaster risk</b> The likelihood over a specified time period of severe alterations in the normal functioning of a community or a society due to hazardous physical events interacting with vulnerable social conditions, leading to widespread adverse human, material, economic or environmental effects that require immediate emergency response to satisfy critical human needs and that may require external support for recovery.</p>
<p><b>Disaster risk management</b> The systematic process of using administrative directives, organisations and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.</p>	<p><b>Disaster risk management</b> Processes for designing, implementing and evaluating strategies, policies and measures to improve the understanding of disaster risk, foster disaster risk reduction and transfer, and promote continuous improvement in disaster preparedness, response and recovery practices, with the explicit purpose of increasing human security, well-being, quality of life, resilience and sustainable development.</p>

**Table 1.1 (cont'd)**

UN Office for Disaster Risk Reduction (UNISDR)	Intergovernmental Panel on Climate Change (IPCC) Special Report on Extreme Events and Disasters
<p><b>Disaster risk reduction</b> The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment and improved preparedness for adverse events.</p>	<p><b>Disaster risk reduction</b> Denotes both a policy goal or objective, and the strategic and instrumental measures employed for anticipating future disaster risk; reducing existing exposure, hazard, or vulnerability; and improving resilience.</p>
<p><b>Emergency</b> a threatening condition that requires urgent action.</p>	
<p><b>Emergency management</b> The organisation and management of resources and responsibilities for addressing all aspects of emergencies, in particular preparedness, response and initial recovery steps.</p>	
<p><b>Exposure</b> People, property, systems or other elements present in hazard zones that are thereby subject to potential losses.</p>	<p><b>Exposure</b> The presence of people; livelihoods; environmental services and resources; infrastructure; or economic, social, or cultural assets in places that could be adversely affected.</p>
<p><b>Extensive risk</b> The widespread risk associated with the exposure of dispersed populations to repeated or persistent hazard conditions of low or moderate intensity, often of a highly localised nature, which can lead to debilitating cumulative disaster impacts.</p>	

Table 1.1 (cont'd)

UN Office for Disaster Risk Reduction (UNISDR)	Intergovernmental Panel on Climate Change (IPCC) Special Report on Extreme Events and Disasters
<p><b>Hazard</b> A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption or environmental damage.</p>	<p><b>Hazard</b> The potential occurrence of a natural or human-induced physical event that may cause loss of life, injury or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision and environmental resources.</p>
<p><b>Resilience</b> The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.</p>	<p><b>Resilience</b> The ability of a system and its component parts to anticipate, absorb, accommodate or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration or improvement of its essential basic structures and functions.</p>
<p><b>Risk</b> The combination of the probability of an event and its negative consequences.</p>	
<p><b>Risk management</b> The systematic approach and practice of managing uncertainty to minimise potential harm and loss.</p>	
<p><b>Vulnerability</b> The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.</p>	<p><b>Vulnerability</b> The propensity or predisposition to be adversely affected.</p>
<p><i>2009 UNISDR Terminology on Disaster Risk Reduction</i> (Geneva: UNISDR, 2009), <a href="http://www.unisdr.org/we/inform/publications/7817">http://www.unisdr.org/we/inform/publications/7817</a>.</p>	<p><i>IPCC, Managing the Risks of Extreme Events and Disasters To Advance Climate Change Adaptation: Special Report of the Intergovernmental Panel on Climate Change</i> (New York: Cambridge University Press, 2012), <a href="http://ipcc-wg2.gov/SREX/report">http://ipcc-wg2.gov/SREX/report</a>. (Note that some of the definitions used in this report differ from those used in other IPCC publications.)</p>